

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Peter R. Orszag (CN=Peter R. Orszag/OU=OPD/O=EOP [OPD])

CREATION DATE/TIME:27-FEB-1998 13:22:05.00

SUBJECT: NEW draft of memo to Klain: PLEASE SHOW TO GENE

TO: Gene B. Sperling (CN=Gene B. Sperling/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Jonathan A. Kaplan (CN=Jonathan A. Kaplan/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Sally Katzen (CN=Sally Katzen/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Peter A. Weissman (CN=Peter A. Weissman/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Russell W. Horwitz (CN=Russell W. Horwitz/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:
This version reflects (or at least tries to reflect) instructions from
Sally, as well as comments from Janet. PLEASE SHOW TO GENE. We'd like to
get this in to Klain today.===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:
Unable to convert ARMS_EXT:[ATTACH.D24]MAIL44988475K.026 to ASCII,
The following is a HEX DUMP:

February 27, 1998

MEMORANDUM FOR RON KLAIN

FROM: GENE SPERLING

SUBJECT: Climate change economic analysis

Next week, Janet Yellen will appear before the House Commerce Committee and the Senate Agriculture Committee to present the Administration's economic analysis of the Kyoto agreement. The purpose of this memo is to explore whether her testimony should include specific figures on the impact for a typical 4-person family of meeting the Kyoto targets.

Background on macroeconomic estimates

To provide some perspective on the controversies surrounding the impact of the Kyoto agreement, it is worth noting that the Global Climate Information Project, which is sponsored by opponents to the treaty, claims that returning U.S. emissions to 1990 levels by 2010 -- let alone below 1990 levels -- would raise gas prices by 50 cents per gallon and electricity prices by 23 percent. Similar studies -- including from disinterested outside observers and indeed even the draft IAT report from last year -- conclude that reducing emissions to 1990 levels by 2010 could be quite costly (e.g., that the effort could raise costs to the typical family of up to \$2,000 per year and could result in losses of well over a million jobs).

Such studies do not accurately reflect many of the institutional details of the Kyoto agreement. For example, they ignore the role of international trading and the clean development mechanism -- which, as Janet emphasizes, could substantially reduce the costs involved. Indeed, given such factors, Janet concludes that "our overall assessment is that the economic cost to the United States...will be modest."

After providing a large number of caveats about the limitations of models and the uncertainty surrounding many of the assumptions, Janet notes that with international trading and the clean development mechanism, but without the benefits of mitigating climate change or restructuring the electricity industry, the economic cost of achieving the Kyoto targets may amount to \$7 to \$12 billion per year (or roughly 0.1 percent of GDP) between 2008 to 2012.

Translating macroeconomic effects into impacts on families

Given these macroeconomic numbers, a critical question is how much specificity to provide in Janet's testimony regarding the resultant impact on families. The \$7 to \$12 billion range corresponds to an increase in gas prices of about 4 to 6 cents a gallon, an increase in

electricity prices of 3 to 4 percent, and an increase in the typical 4-person family's energy bill of somewhere between \$75 and \$125 per year between 2008 and 2012.

The following factors may help to put the \$75-\$125 range in perspective:

- It does not reflect the benefits from electricity restructuring -- which is a critical component of the President's climate change policies and which could more than fully offset any increase in energy prices. We expect that electricity restructuring will produce an offsetting gain of roughly \$90 for the typical 4-person family -- so that the net effect on the energy bill for the typical 4-person family could be between a \$15 decline and a \$35 increase per year in 2008-2012.
- It does not reflect the benefits of addressing climate change. We must remember that any small net cost is equivalent to purchasing a partial insurance policy against the potentially catastrophic losses should we allow climate change to continue unabated.
- It does not reflect the impact of the tax incentives put forward in the President's budget. The proposed package contains \$3.6 billion over the next 5 years in tax cuts, including tax credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles; a 15 percent credit (up to \$2,000) for consumers who purchase rooftop solar equipment, and a \$2,000 credit for purchasing energy-efficient new homes.
- The range varies somewhat, but not very dramatically, across regions and income classes. For example, people who live in colder climates use more energy for heating, but also less energy for air conditioning. The variation in average energy expenditures across the regions and states of the United States is thus modest. Similarly, the elasticity of energy expenditures with respect to income is relatively low, so that average energy expenditures do not vary substantially by income class. Even a family with income of \$100,000 would face an energy cost increase only about 50 percent more than the typical four-person family (so that the increase without electricity restructuring could be described as perhaps between \$115 and \$200 for a family with income of \$100,000).

Some on the climate team (e.g., Todd Stern) feel that it is better to include the \$75-\$125 range in Janet's testimony, to beat back our opponents' assertions about \$2,000 energy cost increases. It is also possible that the figures will come out in Q&A in any case, and that being pro-active by putting the numbers in the testimony could be beneficial. But despite the caveats listed above, it is possible that opponents will be able to find specific examples of families for whom the burden could be somewhat higher than the range given.

Please let me know what you think.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Peter R. Orszag (CN=Peter R. Orszag/OU=OPD/O=EOP [OPD])

CREATION DATE/TIME:27-FEB-1998 10:38:05.00

SUBJECT: DRAFT memo to Klain

TO: Russell W. Horwitz (CN=Russell W. Horwitz/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Gene B. Sperling (CN=Gene B. Sperling/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Jonathan A. Kaplan (CN=Jonathan A. Kaplan/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Peter A. Weissman (CN=Peter A. Weissman/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Sally Katzen (CN=Sally Katzen/OU=OPD/O=EOP @ EOP [OPD])
READ:UNKNOWN

TEXT:
Please let me know if you have any changes or edits. We should try to get
this memo to Klain today. Thanks.===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:
Unable to convert ARMS_EXT:[ATTACH.D85]MAIL42739375F.026 to ASCII,
The following is a HEX DUMP:

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Background

To provide some perspective on the controversies surrounding the impact of the Kyoto agreement, it is worth noting that the Global Climate Information Project, which is sponsored by opponents to the treaty, claims that returning U.S. emissions to 1990 levels by 2010 -- let alone below 1990 levels -- would raise gas prices by 50 cents per gallon and electricity prices by 23 percent. Similar studies assert that reducing emissions to 1990 levels by 2010 would cost the typical family up to \$2,000 per year and would result in losses of well over a million jobs.

Such studies do not accurately reflect many of the institutional details of the Kyoto agreement. For example, they ignore the role of international trading and the clean development mechanism -- which, as Janet emphasizes, could substantially reduce the costs involved. Indeed, given such factors, Janet concludes that "our overall assessment is that the economic cost to the United States...will be modest relative to the value of the insurance against climate change we are purchasing."

Impact on families

A critical question is how much specificity to provide regarding the impact on families in Janet's testimony. After providing a large number of caveats about the limitations of models and the uncertainty surrounding many of the assumptions, Janet notes that with international trading and the clean development mechanism, but without the benefits of mitigating climate change or restructuring the electricity industry, the economic cost of achieving the Kyoto targets may amount to \$7 to \$12 billion per year (or roughly 0.1 percent of GDP) between 2008 to 2012.

That corresponds to an increase in gas prices of about 4 to 6 cents a gallon, an increase in electricity prices of 3 to 4 percent, and an increase in the typical 4-person family's energy bill of somewhere between \$75 and \$125 per year between 2008 and 2012.

The following factors may help to put the \$75-\$125 range in perspective:

- The \$75 to \$125 range, which applies to expenditures a full decade from now, does not reflect the benefits from electricity restructuring -- which is a critical component of the President's climate change policies and which could more than fully offset any increase in energy prices. We expect that electricity restructuring will produce an offsetting gain of roughly \$90 for the typical 4-person family -- so that the net effect on the energy bill for the typical 4-person family could be between a \$15 decline and a \$35 increase per year in 2008-2012.
- The \$75 to \$125 range does not reflect the benefits of addressing climate change. We must remember that any small net cost is equivalent to purchasing an insurance policy against the potentially catastrophic losses should we allow climate change to continue unabated.
- The \$75 to \$125 range does not reflect the impact of the tax incentives put forward in the President's budget. The proposed package contains \$3.6 billion over the next 5 years in tax cuts, including tax credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles; a 15 percent credit (up to \$2,000) for consumers who purchase rooftop solar equipment, and a \$2,000 credit for purchasing energy-efficient new homes.
- The \$75 to \$125 range varies somewhat, but not very dramatically, across regions and income classes. For example, people who live in colder climates use more energy for heating, but also less energy for air conditioning. The variation in average energy expenditures across the regions and states of the United States is thus modest. Similarly, the elasticity of energy expenditures with respect to income is relatively low, so that average energy expenditures do not vary substantially by income class. Even a family with income of \$100,000 would face an energy cost increase only about 50 percent more than the typical four-person family (so that the increase without electricity restructuring could be described as perhaps between \$115 and \$200 for a family with income of \$100,000).

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Please let me know what you think.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:27-FEB-1998 13:26:13.00

SUBJECT: One-pager

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

I see in Randy's new testimony that the \$75-\$125 figure has changed to \$70 to \$110 and the estimates from electricity restructuring have also changed. This needs to be changed in the one pager as well.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 1-MAR-1998 17:55:15.00

SUBJECT: oil shock paragraph

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Janet,

Here is the oil shock section from the original draft -- in case you want to put something like the first paragraph back in, (as part of your idea of reducing emphasis on how the difference is that Kyoto does not involve transfers of purchasing power)..

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D19]MAIL47635695S.026 to ASCII,

The following is a HEX DUMP:

The overwhelming majority of models that address climate change do not predict any change in aggregate employment. Admittedly, these are models that incorporate full employment of the labor force by design. But this is probably the right sort of model to apply, in the case of a structural change that is to be determined and publicly known 15 years in advance. Most workers will be able to plan ahead, and move into expanding fields rather than contracting ones. The same is true of capital and technology. And given a 15-year lead time, monetary policy will be able to adjust to avoid any losses in aggregate demand. Thus there need be no negative effects on output and employment.

The situation might be different if a large energy shock were to hit the economy with no warning, as happened in the oil crisis of 1973-74, when the real money supply, output and employment all contracted sharply. In addition to hitting with no warning, the oil shocks of the 1970s also entailed large transfers from the U.S. and other oil-importing countries to OPEC, thus depressing real income and spending in the former. A self-imposed shift in the relative price of carbon-intensive energy to address global climate change, on the other hand, need not entail such a transfer of purchasing power. Thus there are critical differences between the oil price shocks and the effort to reduce carbon emissions. Our reassuring conclusion regarding aggregate output might, however, be different if the policy were to be implemented inefficiently (by command-and-control style regulations of the sort put in place in that oil crisis) rather than efficiently (by market mechanisms of the sort that the President has proposed to use).

I have seen one study that claims large losses in output and employment from climate change policy [EPI, 8/14/97]. But it did not in my view take into account the points I have made about the ability of the economy to adjust to structural change with a 15-year warning.

Furthermore, it did not take into account many cost-reducing elements of the agreement and our proposed implementation -- such as international and domestic trading.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 08:37:49.00

SUBJECT: DRAFT MEMO ON EARLY ACTION CREDIT FOR CARBON REDUCTIONS

TO: Adele C. Morris (CN=Adele C. Morris/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

----- Forwarded by Janet L. Yellen/CEA/EOP on 03/02/98
08:37 AM -----

Peter R. Orszag
03/02/98 08:24:52 AM
Record Type: Record

To: See the distribution list at the bottom of this message

cc:

Subject: DRAFT MEMO ON EARLY ACTION CREDIT FOR CARBON REDUCTIONS

Per Todd's request, please find attached a very rough first draft of a memo on early action credit that Jon Gruber and I wrote. We have not yet spoken with EDF or any other outsiders.

Comments and edits are welcome.

Message Sent

To:

Jeffrey A. Frankel/CEA/EOP
forrister_d @ btgcinema.com @ inet
Joseph E. Aldy/CEA/EOP
Janet L. Yellen/CEA/EOP
Todd Stern/WHO/EOP
William J. Antholis/OPD/EOP
Jonathan H. Adashek/WHO/EOP
Sally Katzen/OPD/EOP
David B Sandalow/CEQ/EOP

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D7]MAIL41258306J.026 to ASCII,

The following is a HEX DUMP:

DRAFT: CLIMATE CHANGE EARLY ACTION CREDIT OPTIONS

March 2, 1998

The Administration's October 22 press packet on climate change states that "to provide an incentive for near-term actions to cut emissions, the President is committed to ensuring appropriate rewards for firms that act early." The purpose of this memorandum is to delineate options on such credit for early action.

Two forms of incentive for early action

The incentives for early action could take two basic forms:

- Weaker form of incentive: Clarify no penalty for early action. The weaker form of incentive is to clarify to firms that they will not be penalized for reductions in emissions that they do between now and 2008, by insisting that any allocation of permits in 2008 will be based on some historical (1990 or 1998) measure of emissions. In this case, if permits are auctioned, firms that start reducing emissions now would have to purchase fewer permits then. If permits are allocated based on historical emissions, firms that reduce emissions now will have excess permits to sell then. Either way, the firm benefits.

Some firms are concerned, however, permits will be allocated on the basis of *future* emissions -- such as on the basis of emissions in 2007 or 2008. Early action could therefore actually be penalized, because firms that reduced emissions now would be disadvantaged relative to firms that did not act. Such penalties are simply avoided by making clear that the allocation scheme would be based on current (1998) or past (1990) emissions -- so that firms that reduce emissions now could have excess permits in the future.

- Stronger form of incentive: Earning explicit credits. A stronger form of incentive is to provide explicit credits for early action. For example, firms that reduced emissions now could be granted points that could be redeemed for emission permits, or for price discounts at auctions, in the future. In order to ensure compliance with the Kyoto targets, the explicit credits would not affect the national emissions total during the budget period. Rather, they would be "carved out" of the national total (or would reduce the proceeds from the auctions, if the permits are auctioned and the points are used to earn discounts at the auctions). Note that the stronger form of incentive would be in addition to, not instead of, the weaker form.

EDF and others are advocating this stronger form of incentive, which may be absolutely critical to building support from mainstream corporations for the carbon reduction effort. The stronger form, however, poses a series of extremely difficult problems -- particularly without knowledge of the precise structure for the ultimate carbon regime. Some of the

more difficult issues include:

- *Horizontal Equity*: How should the government treat firms that don't exist now? What about firms that go out of business between now and 2008? These are issues which are central to both the weaker and stronger forms of early action.

- *Coverage*: Which entities should be eligible for early credit? It is hard to determine how to allocate early credit (e.g. upstream or downstream) when we don't know how the permits themselves will be allocated

- *Additionality*: As with JI, there is an important concern about ensuring that early credit is not granted for actions that would have been taken without such credit. In the case of JI, this concern is important but misjudging additionality somewhat is not critical, since it simply means the world misses its reduction targets by a very small amount. But in the case of early action, additionality becomes more important, because actions misjudged as additional and rewarded as such can create important property rights battles in 2008.

- *Monitoring*: It obviously becomes immediately important to verify that reductions off of the business-as-usual baseline are actually occurring. This implies establishing in the very short run a detailed monitoring and verification system, that we would otherwise not necessarily need until 2008.

- *What is a "point" worth?*: As described below, the stronger form of early action would require the assignment of property rights ("points") to emissions reductions. But, given that we are likely to want to limit the share of our reductions that can be done by early action (e.g. have a total "early action budget"), it is not clear how to value these points. Are the points of a fixed value, so we ration who gets early credit - and how is the rationing done? Or does any early action get points, and they are simply devalued (relative to a fixed total) as the amount of early action increases?

Importance of credibility

The impact on firm behavior now -- under either the weaker or stronger form of early action incentives -- is affected by the credibility and certainty of the early action program. If the promised benefits are highly uncertain, or are unduly subject to the whims of future Administrations or Congresses, firms are unlikely to alter their behavior significantly.

In particular, the Administration by itself can not fully commit future Administrations or Congresses to a specific course of action. Therefore, firms are not likely to respond as vigorously to proclamations by the Administration as to actual legislation. A critical question we face, however, is the extent to which an Administration statement would provide sufficient credibility to spur early action.

Difficulty of designing early action program before designing national permit trading program

The design of the national carbon emissions reduction regime will be one of the most technically challenging issues facing the relevant policy-makers as the Kyoto implementing legislation is developed (assuming that the legislative authority for the emissions reduction regime will be included in the implementing legislation). Critical design questions include whether the permit requirements will be imposed upstream or downstream, and whether the permits will be auctioned or grandfathered.

One principle that all relevant agencies seem to agree upon is that the early action program should not restrict or pre-judge in any way the design of the ultimate emission reduction regime. That principle makes design of the early action system substantially more challenging. For example, to ensure that we do not pre-judge the decision about whether to auction or grandfather permits, the early action program would grant points rather than permits. The points could then be made consistent with either an auctioned or grandfathered system. To ensure that the coverage of the early action system does not pre-judge the decision about where in the distribution system to impose the ultimate permit requirements, we would have to emphasize that the points will be tradeable (so that firms earning points but not subject to permit requirements could sell the points to other firms).

OPTIONS

This section presents four basic options for moving forward. A threshold question is whether we submit legislation for an early action program in legislation before the domestic implementing legislation is submitted.

OPTION 1: POTUS STATEMENT ON WEAKER FORM OF INCENTIVE (BASELINE WILL BE HISTORICAL)

Under this option, the President would publicly state that if the permits are grandfathered, they should be grandfathered on the basis of emissions in 1990 or 1998, not future emissions.

PROS:

- Does not necessitate carve-out of future emissions permits.

CONS:

- Provides little certainty or incentive to firms, since implementing legislation may not be submitted until after this Administration.
- Could be falsely viewed as incongruous with promises for early action program.

- May be seen as biased toward grandfathering rather than auctioning.

OPTION 2: POTUS STATEMENT ON WEAKER AND STRONGER FORMS, PROMISE TO INCLUDE EARLY ACTION IN DOMESTIC IMPLEMENTING LEGISLATION

Under this option, the President would emphasize his commitment to both the weaker and stronger forms of early action incentives. He would also promise that the stronger form program would be included in the domestic implementing legislation, likely to be submitted when the treaty is sent to the Senate for ratification.

PROS:

- The domestic implementing legislation will resolve questions about the ultimate carbon regime, making it much easier and more natural to design an effective early action program.
- The implementing legislation could be submitted within the next few years, so that the early action program would be included in legislation in the relatively near future. It would thus have time to take hold before the first budget period.

CONS:

- Does not provide immediate early action program to firms, so that impact is delayed somewhat.
- Makes a promise on which we may be unable to deliver if we don't end up with domestic implementation of a GHG reduction plan (e.g. if international negotiations collapse at some future date). Probably not an important problem, since "nothing is in writing."

OPTION 3: SUBMIT EARLY ACTION LEGISLATION NOW

Under this option, we would submit legislation on the stronger form of early action incentives now.

PROS:

- If passed, provides incentives for firms to begin early action programs.
- Shows Administration's commitment to moving forward aggressively on carbon reduction efforts.

CONS:

- Awkward to design early action program before ultimate carbon reduction regime is designed.
- Legislation may not pass, and submitting legislation now could provoke more “backdoor implementation” complaints.
- Submitting legislation on this issue opens 1998 to the general climate change debate, defeating the “staged” nature of our three-tier climate change strategy.
- As before, raises potential problem if we don’t end up with domestic emissions reduction plan. But, in this case, there is the potential that the government could be subject to legal claim on these “property rights”, with resultant legal costs (at least), and perhaps real compensation costs to the “injured parties.”

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Peter R. Orszag (CN=Peter R. Orszag/OU=OPD/O=EOP [OPD])

CREATION DATE/TIME: 2-MAR-1998 08:24:58.00

SUBJECT: DRAFT MEMO ON EARLY ACTION CREDIT FOR CARBON REDUCTIONS

TO: Sally Katzen (CN=Sally Katzen/OU=OPD/O=EOP @ EOP [OPD])

READ:UNKNOWN

TO: William J. Antholis (CN=William J. Antholis/OU=OPD/O=EOP @ EOP [OPD])

READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: forrister_d (forrister_d @ btgcinema.com @ inet [UNKNOWN])

READ:UNKNOWN

TO: David B Sandalow (CN=David B Sandalow/OU=CEQ/O=EOP @ EOP [CEQ])

READ:UNKNOWN

TO: Jonathan H. Adashek (CN=Jonathan H. Adashek/OU=WHO/O=EOP @ EOP [WHO])

READ:UNKNOWN

TO: Todd Stern (CN=Todd Stern/OU=WHO/O=EOP @ EOP [WHO])

READ:UNKNOWN

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

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Comments and edits are welcome.===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D34]MAIL45418306W.026 to ASCII,
The following is a HEX DUMP:

DRAFT: CLIMATE CHANGE EARLY ACTION CREDIT OPTIONS

March 2, 1998

The Administration's October 22 press packet on climate change states that "to provide an incentive for near-term actions to cut emissions, the President is committed to ensuring appropriate rewards for firms that act early." The purpose of this memorandum is to delineate options on such credit for early action.

Two forms of incentive for early action

The incentives for early action could take two basic forms:

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In particular, the Administration by itself can not fully commit future Administrations or Congresses to a specific course of action. Therefore, firms are not likely to respond as vigorously to proclamations by the Administration as to actual legislation. A critical question we face, however, is the extent to which an Administration statement would provide sufficient credibility to spur early action.

Difficulty of designing early action program before designing national permit trading program

The design of the national carbon emissions reduction regime will be one of the most technically challenging issues facing the relevant policy-makers as the Kyoto implementing legislation is developed (assuming that the legislative authority for the emissions reduction regime will be included in the implementing legislation). Critical design questions include whether the permit requirements will be imposed upstream or downstream, and whether the permits will be auctioned or grandfathered.

One principle that all relevant agencies seem to agree upon is that the early action program should not restrict or pre-judge in any way the design of the ultimate emission reduction regime. That principle makes design of the early action system substantially more challenging. For example, to ensure that we do not pre-judge the decision about whether to auction or grandfather permits, the early action program would grant points rather than permits. The points could then be made consistent with either an auctioned or grandfathered system. To ensure that the coverage of the early action system does not pre-judge the decision about where in the distribution system to impose the ultimate permit requirements, we would have to emphasize that the points will be tradeable (so that firms earning points but not subject to permit requirements could sell the points to other firms).

OPTIONS

This section presents four basic options for moving forward. A threshold question is whether we submit legislation for an early action program in legislation before the domestic implementing legislation is submitted.

OPTION 1: POTUS STATEMENT ON WEAKER FORM OF INCENTIVE (BASELINE WILL BE HISTORICAL)

Under this option, the President would publicly state that if the permits are grandfathered, they should be grandfathered on the basis of emissions in 1990 or 1998, not future emissions.

PROS:

- Does not necessitate carve-out of future emissions permits.

CONS:

- Provides little certainty or incentive to firms, since implementing legislation may not be submitted until after this Administration.
- Could be falsely viewed as incongruous with promises for early action program.

- May be seen as biased toward grandfathering rather than auctioning.

OPTION 2: POTUS STATEMENT ON WEAKER AND STRONGER FORMS, PROMISE TO INCLUDE EARLY ACTION IN DOMESTIC IMPLEMENTING LEGISLATION

Under this option, the President would emphasize his commitment to both the weaker and stronger forms of early action incentives. He would also promise that the stronger form program would be included in the domestic implementing legislation, likely to be submitted when the treaty is sent to the Senate for ratification.

PROS:

- The domestic implementing legislation will resolve questions about the ultimate carbon regime, making it much easier and more natural to design an effective early action program.
- The implementing legislation could be submitted within the next few years, so that the early action program would be included in legislation in the relatively near future. It would thus have time to take hold before the first budget period.

CONS:

- Does not provide immediate early action program to firms, so that impact is delayed somewhat.
- Makes a promise on which we may be unable to deliver if we don't end up with domestic implementation of a GHG reduction plan (e.g. if international negotiations collapse at some future date). Probably not an important problem, since "nothing is in writing."

OPTION 3: SUBMIT EARLY ACTION LEGISLATION NOW

Under this option, we would submit legislation on the stronger form of early action incentives now.

PROS:

- If passed, provides incentives for firms to begin early action programs.
- Shows Administration's commitment to moving forward aggressively on carbon reduction efforts.

CONS:

- Awkward to design early action program before ultimate carbon reduction regime is designed.
- Legislation may not pass, and submitting legislation now could provoke more “backdoor implementation” complaints.
- Submitting legislation on this issue opens 1998 to the general climate change debate, defeating the “staged” nature of our three-tier climate change strategy.
- As before, raises potential problem if we don’t end up with domestic emissions reduction plan. But, in this case, there is the potential that the government could be subject to legal claim on these “property rights”, with resultant legal costs (at least), and perhaps real compensation costs to the “injured parties.”

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 11:31:25.00

SUBJECT: Revised softball questions

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

I eliminated one question and made a small change in another. The rest

look just fine.===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D42]MAIL468494065.026 to ASCII,

The following is a HEX DUMP:

In your testimony Dr. Yellen, you note that no model is set up to handle all of the parameters of the Kyoto Protocol. Why is it so difficult to assess this policy with an economic model?

Dr. Yellen, in your written testimony you provide some preliminary estimates of the costs of achieving our target under the Kyoto Protocol. However, you state that it is virtually impossible to quantify the climate benefits of the Protocol. Why is it nearly impossible to do so?

Last week, Dr. Robert Stavins, an economist at Harvard, gave a Congressional briefing on the Kyoto Protocol. He pronounced the Kyoto Protocol as flawed but fixable. Dr. Yellen, from an economic perspective, what do we need to do to fix the protocol and what would be the likely economic effects of achieving these fixes?

Dr. Yellen, in your testimony, you note that emissions trading among the so-called “umbrella” countries could yield greater cost-savings to the United States than trading among all Annex I countries. Why would the costs be lower for the U.S. under this umbrella arrangement?

Dr. Yellen, we have heard numerous times, and again here today, that international trading in emissions rights lowers the costs for the U.S. Could you please explain why international trading is so beneficial? Further, could you also give an example or two of what private firms in other countries might do to lower their emissions so they may sell inexpensive emissions rights to American companies?

Dr. Yellen, many countries pushed for an earlier commitment period than the one the Administration advocated. In the end, the Administration position of a commitment period starting in 2008 was included in the Protocol. What is the economic rationale for pushing for a later commitment period?

Dr. Yellen, some countries wanted a single year target, while the Administration advocated for a five-year commitment period. What are the economic benefits of a five-year average relative to a one-year target?

Dr. Yellen, many countries wanted the Protocol to address only the three major greenhouse gases, carbon dioxide, methane, and nitrous oxide. The Administration advocated, and won, inclusion of all 6 categories of greenhouse gases. What are the economic benefits of including 6 kinds of gases, instead of 3?

In addition to the emissions of greenhouse gases from industrial activities, the climate can be affected by activities that take up, or sequester greenhouse gases. These so-called "carbon sinks" remove some of our emissions of carbon dioxide and can mitigate the effects on the climate. Some countries opposed the inclusion of sinks in the Protocol, but the Administration fought for the right to include the effects of some carbon sinks on achieving our emissions target under the Protocol. Dr. Yellen, why does the inclusion of carbon sinks help lower our costs of complying with the Kyoto Protocol?

Dr. Yellen, the Administration has proposed a domestic permit trading system to reduce emissions of greenhouse gases based on the country's experience with the acid rain trading program. Could you explain why a system of tradeable greenhouse gas permits is superior to other approaches?

Dr. Yellen, you discuss in your testimony the cost-savings possible with effective international trading. Since the rules of international trading have not been agreed to, could you describe what you mean by an effective international emissions market?

Dr. Yellen, you state in your testimony that the Kyoto Protocol will not affect aggregate employment. However, we have heard from other economists that this agreement could cost the U.S. millions of jobs. Why is the range of estimates so large?

The Kyoto Protocol does not require countries to meet binding targets until 2008. However, there are certain aspects of the Protocol, such as the Clean Development Mechanism, that allow for emissions reductions to occur as early as the year 2000 that could be used over the 2008-2012 period. Further, the Administration is pushing for funding for tax incentives and R&D to spur the adoption of energy efficient technology now. Dr. Yellen, why is it important to do these things now?

Dr. Yellen, you state that the need to bring in developing countries into the Protocol is not based on competitiveness concerns. Could you explain why your analysis indicates that developing countries operating without binding commitments will not adversely affect U.S. competitiveness? Could you then further discuss the reasons why these countries should participate?

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Adele C. Morris (CN=Adele C. Morris/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 18:59:09.00

SUBJECT: Sink Q and A's

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

I'll also give you a copy of the material from the forest products industry, in case you want to see more about where they're coming from.

Adele

----- Forwarded by Adele C. Morris/CEA/EOP on 03/02/98
06:43 PM -----

Adele C. Morris
03/02/98 06:56:28 PM
Record Type: Record

To: See the distribution list at the bottom of this message
cc:
Subject: Sink Q and A's

Here's a draft of a few sink q and a's. Mario Merida (State) is drafting additional questions which should complement these, but rather than wait for those I'm sending these tonight. When I get those, I'll incorporate them and send out a new complete draft. Comments welcome.

Message Sent

To:
MERIDAME @ ms6820wpoa.us-state.gov @ INET @ LNGTWY
Randall W. Lutter/CEA/EOP
Joseph E. Aldy/CEA/EOP
Michele Jolin/CEA/EOP
William J. Antholis/OPD/EOP
JONATHAN.GRUBER @ MS01.DO.treas.sprint.com @ INET @ LNGTWY
Joe.Glauber @ usda.gov @ INET @ LNGTWY

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D81]MAIL43177706Z.026 to ASCII,

The following is a HEX DUMP:

Q and A's on sinks and forestry industry

The climate policy concerns of the forest products industry derive from several special features of the industry:

- The industry has an obvious role in carbon sequestration.
- Their plants experience especially slow capital stock turnover.
- The industry is very energy intensive.
- Some subsectors use biomass energy extensively (up to 43% of total energy)
- The industry is already facing significant burdens of new environmental regulation, e.g. the Cluster Rule, NAAQS standards, MACT standards for Wood Manufacturing Facilities, etc. for a total of \$5.8-\$9.8 billion in capital costs in 1998-2008, according to industry documents.
- Parts of the industry are at best only marginally competitive with developing countries.

Won't the U.S. emissions commitment damage the competitiveness of our timber and wood products industries vis a vis those in developing countries?

[Refer to general answer on competitiveness and what we say to energy-intensive sectors.]

Much of the energy used in the forest products industry is biomass, such as wood wastes and pulp liquors. Will the burning of biomass be treated like other carbon emissions under the treaty?

Biomass is one of a number of sink-related activities that must be addressed as we prepare an accounting system under the treaty. The U.S. and our treaty partners will have to develop a system that sets out how to account for the carbon stored in growing biofuel and the carbon emitted when it is burned. No decisions have been made as to the exact methodology that will be used for biomass.

How is the Administration going to interpret afforestation, reforestation, and deforestation? Since parties aren't explicitly penalized for harvesting and they are credited for replanted forests, doesn't the treaty language create a perverse incentive to cut down forests?

Our position has been that carbon effects from land use changes and forestry activity should be counted in the emissions calculations. The treaty reflects this position, which makes scientific and economic sense. Only by including both emissions and sequestration in the accounting system will parties face the proper incentives to sequester greenhouse gases through their land use activities. In fact, forestry initiatives may provide some of the most cost-effective opportunities to meet our emissions targets, and we have and will continue to encourage land stewardship that is environmentally sound.

That said, there are many technical details of a carbon accounting system to work out, and we have technical experts working hard to develop a scientifically, environmentally, and economically responsible approach. If a careful analysis indicates that the activities included in

the list under Article 3.3 are not sufficient to properly account for significant carbon influences, under Article 3.4 the parties may add other human-induced land use changes and forestry activities to the list. We will be coordinating a carbon accounting system with other parties so as to ensure two things: (1) that emissions targets are met equitably and (2) that the international permit trading system and Clean Development Mechanism will promote cost effective and environmentally beneficial land use activities.

Dr. Yellen, my state is blessed with abundant forests, and timber sales are an important part of our economy. You've mentioned that the Administration fought for and won inclusion of forestry activities in the calculation of net emissions in the treaty. What does the Kyoto Protocol mean for the forest products industry?

Forests play an important role in sequestering carbon from the atmosphere. We expect that some of the most cost effective means of reducing net emissions and meeting our treaty targets may come from additional sequestration in land use changes and forestry. While our economic analysis has not singled out individual sectors of the economy, it is safe to say that afforestation and reforestation can ease the U.S. commitment, and the Administration looks forward to working with the forest products industry to identify cost effective strategies to encourage those activities.

I understand that according to the Administration's math, 3% equals 7%. How is this possible?

In negotiations under the Kyoto Protocol, the US agreed to a commitment of a 7% reduction below base period emissions. The U.S. accepted changes in calculation of the obligation for synthetic gases, forests and land use change that allowed the US to deepen its numerical target for the same level of effort. Moving to a 1995 base year for synthetic gases (alternatives to ozone depleting gases and other synthetic chemicals e.g. HFC, PFC, and SF6) reduced the US commitment by 1%. Removing a penalty in the accounting system for forests and land use change reduced the US commitment by 3%. In addition, the US agreed to 3% additional reductions over our initial position of stabilizing emissions at 1990 levels.

Will farmers/utilities/companies be able to receive credit for improving agriculture soil carbon, forest conservation, or forest management?

The language of the Protocol limits carbon sequestration activities to afforestation and reforestation, but provides for this list of activities to be amended at the next negotiating session.

The inclusion of afforestation and reforestation will allow the US to take advantage of low cost carbon sequestration projects that result in verifiable changes in stocks. The US recognizes that the list of activities to receive credit is limited, and will work with key environmental and business constituencies to develop a strategy to ensure that verifiable and cost-effective carbon sequestration projects and actions receive credit under the Kyoto Protocol. We will continue to work on these elements as we move forward with developing and implementing other key provisions of the agreement, including the rules for international trading and the Clean Development Mechanism.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 11:09:28.00

SUBJECT: Most recent version of one-pager

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Attached.

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D97]MAIL40587406F.026 to ASCII,

The following is a HEX DUMP:

BACKGROUND ON TESTIMONY BY DR. JANET YELLEN

March 4, 1998

President Clinton is committed to addressing the problem of global climate change while maintaining a strong economy. President Clinton has said that we can work to avert the grave dangers of climate change, while at the same time maintaining the strength of our economy.

The Kyoto Protocol is a form of “planet insurance.” It is difficult to put a price tag on the cost of doing nothing to address the problem of climate change. But, researchers have nonetheless developed troubling cost estimates -- ranging in the tens of billions of dollars per year. And, these estimates, do not even fully reflect the value of “planet insurance” against the small and unknown possibility of large-scale and potentially irreversible catastrophic events, such as a shifting of the Gulf Stream or warming of the Northern tundra which would release large amounts of methane from the permafrost.

Doing it smart: The Kyoto Protocol includes measures that reduce costs. The least-cost approach to controlling climate change is to reduce emissions wherever such reductions are cheapest. Dr. Yellen’s testimony highlights the substantial cost reductions that are associated with international emissions trading, joint implementation by Annex I countries, the clean development mechanism, and other aspects of the Kyoto Protocol. Because of U.S. insistence, the Kyoto Protocol includes many such cost-saving provisions -- and economic analyses that ignore these provisions do not accurately reflect the economic impact of the Kyoto Protocol.

Overall conclusion: Costs will be modest, even without accounting for benefits of electricity restructuring or the value of planet insurance. With effective mechanisms for international trading, Joint Implementation, and the Clean Development Mechanism, as well as meaningful developing country participation, the Administration’s overall assessment is that the economic cost to the United States will be modest.

This conclusion is not entirely dependent on, but fully consistent with, formal model results. Despite the limitations of any single model in assessing the economic impact of the Kyoto Protocol, economic model results are fully consistent with this conclusion. For example, given the factors, such as trading, delineated above, but excluding the benefits of acting and the impact of electricity restructuring, estimates derived using the SGM model suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to just \$7 to \$12 billion per year in 2008 to 2012 -- or just 0.1 percent of projected GDP.

Modest impact on family energy costs. With a successful international trading regime, the SGM-based estimate suggests an emissions price in the range of \$14 to \$23 per ton of carbon equivalent. That translates into an increase in the average family's energy bill of between \$70 - \$110 per year in 2010. However, these estimates do *not* mean that households' energy expenses will in fact be higher in 2010 than today. For instance, the energy price declines from Federal electricity restructuring would be enough to offset the impact described above -- so that the net effect on family energy bills, including the impact of electricity restructuring, could range from a decline of \$20 to an increase of \$20 in 2010.

Cost estimate does not reflect \$6.3 billion package or value of planet insurance. The figures cited in Dr. Yellen's testimony exclude not only climate and non-climate benefits, but also such cost-mitigating factors as sinks and payoffs from the President's \$6.3 billion climate change initiative.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeremy B. Rudd (CN=Jeremy B. Rudd/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 12:19:00.00

SUBJECT: OECD EPC press conference

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

The OECD secretariat has suggested a change to the procedure for releasing the economic outlook following an EPC meeting.

Currently, the outlook is released several weeks after a meeting; a summary of the short-term projections is given immediately after the meeting when you give your press conference. The new suggestion is to replace your press conference with one that Visco will hold about a week after EPC, with data on the short-term economic outlook released at that time. This means that you would not have to hold a press conference after the EPC meeting.

If you approve of this, the secretariat will send out a letter to the ambassadors et al. detailing the new procedure. I have a copy of the draft letter, if you would like to see it.

- Jeremy

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: JONATHAN.GRUBER@MS01.DO.treas.sprint.com@INET@LNGTWY (JONATHAN.GRUBER@MS01.DO.treas.sprint.com@INET@LNGTWY [UNKNOWN])

CREATION DATE/TIME: 2-MAR-1998 01:51:45.00

SUBJECT: comments on lutter draft attached

TO: Janet L. Yellen@eop (Janet L. Yellen@eop [CEA])
READ:UNKNOWN

TO: Randall W. Lutter@eop (Randall W. Lutter@eop [CEA])
READ:UNKNOWN

TO: Peter R. Orszag@eop (Peter R. Orszag@eop [OPD])
READ:UNKNOWN

TO: Jeffrey A. Frankel@EOP (Jeffrey A. Frankel@EOP [CEA])
READ:UNKNOWN

TEXT:

Date: 02/23/1998 08:54 am (Monday)

From: Jonathan Gruber

To: EX.MAIL."lutter_r@a1.eop.gov", EX.MAIL."frankel_j@a1.eop.gov",
orszag, EX.MAIL."yellen_j@a1.eop.gov"

Subject: comments on lutter draft attached

I attach a set of comments on Randy's excellent revision of the
testimony.===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D93]MAIL48465106L.026 to ASCII,
The following is a HEX DUMP:

Comments - Lutter Draft

- 1) Add a sentence at end of intro (after 6.3 billion mention) that also mentions electricity restructuring.
- 2) Page 5 - need more on why 7% is only 3%. I realize that you get to this later, but Stu and others seemed adamant that it happen as early in the testimony as possible, and I agree. Here is a paragraph that I sent to Todd on this. This is probably more detailed than we want - there may be something better in Stu's testimony or from Todd's office (you may want to call over to Jonathan Adushek and get the final version of their talking points on this):

This new position is very similar to the President's announced position, because it is based on a redefined measure of net emissions. Previously, our target was based on the 1990 levels of a comprehensive basket of all six greenhouse gases, and it netted out the change in "sinks", or carbon-absorbing human activity. The new target uses instead a 1995 baseline for the three hydrofluorocarbons; with this new baseline, we can reduce to 1% below baseline emissions by 2008-2012 at the same level of effort as our announced position. The new target also does not net out the change in sinks, but rather only counts a limited set of sinks in the 2008-2012 period. Due to the slowing pace of reforestation in the U.S., our sinks are falling over time, so that by not netting out the change in sinks we make it much easier to meet a given target; with this new definition, we can reduce to 3% below baseline emissions by 2008-2012 at the same level of effort as our announced position. Thus, with this new definition, we can reach a reduction of 4% below 1990 levels with no new effort, so that our 7% reduction "on paper" is really, at most, a 3% increase in effort relative to the President's announcement. Moreover, while there is some ambiguity at this time over what the limited set of sinks that are included means for the U.S., our target is likely to be even easier to hit by benefitting from the sinks that do take place in the budget period. Thus, our final position is a reduction of, at most, 3% from our announced position, and probably less.

- 3) Page 9 - I don't see why you can't beef up the So2 discussion here - you can just lift what you had in earlier drafts (in the technology section) and move it to here.
- 4) Why do we have the paragraph on page 12 about how we are feeding EMF with data for their analysis? This seems to provide an implicit endorsement of EMF, and we may want to back off their results for other reasons later. Why do we need this paragraph? I would suggest we kill it.
- 5) I believe that we now have the administration consensus required to be a bit more forward leaning on the environmental effects of electricity restructuring on page 13-14. You can say more than just that costs to consumers will fall - you can say that there will be improved efficiencies leading to reduced emissions as well (Peter had some good language about this in his POTUS memo).
- 6) You should check your number on effect of LDC participation (55 percent reduction in costs from Annex I) - I may be mixing up permit prices and costs, but I think that the reduction is larger than this.

7) As per Donniger's suggestion, on page 17 you shouldn't talk about effects of moving AEEI from 1 to 1.25, but rather effects of raising AEEI by 25 percentage points.

8) You took out the discussion of why we use the conservative AEEI (the budget parallel). I liked this discussion, even in the context of beefing up our technology points. It provides some defense when folks attack us for being too conservative on technology. I would put it back in at the end of the technology section, and say that, while we fully expect more from technology, we are being conservative for scoring purposes. This allows us to be bullish on technology in spirit, while not placing Janet in the awkward position of necessarily endorsing a higher AEEI.

9) Page 18 - don't say "estimates derived by the Administration using the SGM model" - just say "estimates from the SGM model" - don't make it seem like we are running this model.

10) You should double check that electricity restructuring wipes out energy cost increases under the \$23/ton scenario.

11) Don't include the bracketed sentence on page 19 which explicitly compares SGM to other models - the qualitative statement which precedes it is good enough.

12) You did a good job of incorporating folks comments, with one exception - there is nothing in here about 5 year reviews. I would add this in the section on employment & aggregate effects - "even if we are wrong, there will be reviews...". This point should also make an appearance in the section on "when" flexibility - that we are flexible on timing if the effects on the economy appear to be drastic. That is, we have provided "insurance on our insurance" - we have insurance that the premiums that we are paying for earth insurance don't become onerous for the U.S. economy.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 19:11:31.00

SUBJECT: Re: talking points/one pager

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

I think "in the future" is implicit, isn't it? If we say in the future, we shouldn't say tens of billions of dollars, because as a percent of GDP, by 2050 or 2100, it will amount to a lot more. The alternative is to cite a percent of GDP. On balance, why not leave well enough alone.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: JONATHAN.GRUBER@MS01.DO.treas.sprint.com@INET@LNGTWY (JONATHAN.GRUBER@MS01.DO.treas.sprint.com@INET@LNGTWY [UNKNOWN])

CREATION DATE/TIME: 2-MAR-1998 01:52:39.00

SUBJECT: comments on lutter draft attached

TO: Janet L. Yellen@eop (Janet L. Yellen@eop [CEA])
READ:UNKNOWN

TO: Randall W. Lutter@eop (Randall W. Lutter@eop [CEA])
READ:UNKNOWN

TO: Peter R. Orszag@eop (Peter R. Orszag@eop [OPD])
READ:UNKNOWN

TO: Jeffrey A. Frankel@EOP (Jeffrey A. Frankel@EOP [CEA])
READ:UNKNOWN

TEXT:

Date: 02/23/1998 08:54 am (Monday)

From: Jonathan Gruber

To: EX.MAIL."lutter_r@a1.eop.gov", EX.MAIL."frankel_j@a1.eop.gov",
orszag, EX.MAIL."yellen_j@a1.eop.gov"

Subject: comments on lutter draft attached

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testimony.===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D20]MAIL491751068.026 to ASCII,
The following is a HEX DUMP:

Comments - Lutter Draft

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9) Page 18 - don't say "estimates derived by the Administration using the SGM model" - just say "estimates from the SGM model" - don't make it seem like we are running this model.

10) You should double check that electricity restructuring wipes out energy cost increases under the \$23/ton scenario.

11) Don't include the bracketed sentence on page 19 which explicitly compares SGM to other models - the qualitative statement which precedes it is good enough.

12) You did a good job of incorporating folks comments, with one exception - there is nothing in here about 5 year reviews. I would add this in the section on employment & aggregate effects - "even if we are wrong, there will be reviews...". This point should also make an appearance in the section on "when" flexibility - that we are flexible on timing if the effects on the economy appear to be drastic. That is, we have provided "insurance on our insurance" - we have insurance that the premiums that we are paying for earth insurance don't become onerous for the U.S. economy.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 2-MAR-1998 11:20:29.00

SUBJECT: questions for the Hill

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

----- Forwarded by Michele Jolin/CEA/EOP on 03/02/98
11:20 AM -----

Joseph E. Aldy

02/28/98 12:53:46 PM

Record Type: Record

To: Randall W. Lutter/CEA/EOP, Adele C. Morris/CEA/EOP, Michele
Jolin/CEA/EOP, 74217.3053 @ compuserve.com @ inet

cc:

Subject: the size of a grapefruit

Attached are about 15 "friendly" questions for Janet's testimony. Any comments, edits, additions, subtractions are welcome. Should I write more (several of these will have rather long answers)? Did I forget anything obvious? Are there places where we can be more strategic? Should we add a question where a Representative asks Janet about her son? Randy, I have also attached a 5.1 file for you, if you are working at home.

Joe

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

PRINTER FONT 10_POINT_ROMAN

In your testimony Dr. Yellen, you note that no model is set up to handle all of the parameters of the Kyoto Protocol. Why is it so difficult to assess this policy with an economic model?

Dr. Yellen, in your written testimony you provide some preliminary estimates of the costs of achieving our target under the Kyoto Protocol. However, you state that it is virtually impossible to quantify the climate benefits of the Protocol. Why is it nearly impossible to do so?

Last week, Dr. Robert Stavins, an economist at Harvard, gave a Congressional briefing on the Kyoto Protocol. He pronounced the Kyoto Protocol as flawed but fixable. Dr. Yellen, from an economic perspective, what do we need to do to fix the protocol and what would be the likely economic effects of achieving these fixes?

Dr. Yellen, in your testimony, you note that emissions trading among the so

-called "umbrella" countries could yield greater cost

-savings to the United

States than trading among all Annex I countries. Why would the costs be lower for the U.S. under this umbrella arrangement?

Dr. Yellen, we have heard numerous times, and again here today, that international trading in emissions rights lowers the costs for the U.S. Could you please explain why international trading is so beneficial? Further, could you also give an example or two of what private firms in other countries might do to lower their emissions so they may sell inexpensive emissions rights to American companies?

Dr. Yellen, as I understand it, after accounting for changes in the baseline emissions calculation and sinks, the U.S. target under the Kyoto Protocol is very close to what the Administration proposed in October. In terms of the economic effects, how does the U.S. target under Kyoto fair relative to what it could have been under the E.U. proposal or under the AOSIS proposal?

Dr. Yellen, many countries pushed for an earlier commitment period than the one the Administration advocated. In the end, the Administration position of a commitment period starting in 2008 was included in the Protocol. What is the economic

rationale for pushing for a later commitment period?

Dr. Yellen, some countries wanted a single year target, while the Administration advocated for a five

-year commitment period. What are the economic benefits of a five

-year average relative to a one

-year target?

Dr. Yellen, many countries wanted the Protocol to address only the three major greenhouse gases, carbon dioxide, methane, and nitrous oxide. The Administration advocated, and won, inclusion of all 6 categories of greenhouse gases. What are the economic benefits of including 6 kinds of gases, instead

of 3?

In addition to the emissions of greenhouse gases from industrial activities, the climate can be affected by activities that take up, or sequester greenhouse gases. These so

-called "carbon sinks" remove some of our emissions of carbon dioxide and can mitigate the effects on the climate. Some countries opposed the inclusion of sinks in the Protocol, but the Administration fought for the right to include the effects of some carbon sinks on achieving our emissions target under the Protocol. Dr. Yellen, why does the inclusion of carbon sinks help lower our costs of complying with the Kyoto Protocol?

Dr. Yellen, the Administration has proposed a domestic permit trading system to reduce emissions of greenhouse gases based on the country's experience with the acid rain trading program. Could you explain why a system of tradeable greenhouse gas permits is superior to other approaches, such as CAFE or appliance energy efficiency standards?

Dr. Yellen, you discuss in your testimony the cost

-savings possible with effective international trading. Since the rules of international trading have not been agreed to, could you describe what you mean by an effective international emissions market?

Dr. Yellen, you state in your testimony that the Kyoto Protocol will not affect aggregate employment. However, we have heard from other economists that this agreement could cost the U.S. millions of jobs. Why is the range of estimates so large?

The Kyoto Protocol does not require countries to meet binding targets until 2008. However, there are certain aspects of the Protocol, such as the Clean Development Mechanism, that allow for emissions reductions to occur as early as the year 2000 that could be used over the 2008

-2012 period. Further, the Administration is pushing for funding for tax incentives and R&D to spur the adoption of energy efficient technology now. Dr. Yellen, why is it important to do these things now?

Dr. Yellen, you state that the need to bring in developing countries into the Protocol is not based on competitiveness concerns. Could you explain why your analysis indicates that developing countries operating without binding commitments will not adversely affect U.S. competitiveness? Could you then further discuss the reasons why these countries should participate?

===== END ATTACHMENT 1 =====

===== ATTACHMENT 2 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D70]MAIL47258406F.026 to ASCII,
The following is a HEX DUMP:

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RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: JONATHAN.GRUBER@MS01.DO.treas.sprint.com@INET@LNGTWY (JONATHAN.GRUBER@MS01.DO.treas.sprint.com@INET@LNGTWY [UNKNOWN])

CREATION DATE/TIME: 2-MAR-1998 03:36:17.00

SUBJECT: comments on lutter draft attached

TO: Janet L. Yellen@eop (Janet L. Yellen@eop [CEA])
READ:UNKNOWN

TO: Randall W. Lutter@eop (Randall W. Lutter@eop [CEA])
READ:UNKNOWN

TO: Peter R. Orszag@eop (Peter R. Orszag@eop [OPD])
READ:UNKNOWN

TO: Jeffrey A. Frankel@EOP (Jeffrey A. Frankel@EOP [CEA])
READ:UNKNOWN

TEXT:

Date: 02/23/1998 08:54 am (Monday)

From: Jonathan Gruber

To: EX.MAIL."lutter_r@a1.eop.gov", EX.MAIL."frankel_j@a1.eop.gov",
orszag, EX.MAIL."yellen_j@a1.eop.gov"

Subject: comments on lutter draft attached

I attach a set of comments on Randy's excellent revision of the
testimony.===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D89]MAIL41029206K.026 to ASCII,
The following is a HEX DUMP:

Comments - Lutter Draft

1) Add a sentence at end of intro (after 6.3 billion mention) that also mentions electricity restructuring.

2) Page 5 - need more on why 7% is only 3%. I realize that you get to this later, but Stu and others seemed adamant that it happen as early in the testimony as possible, and I agree. Here is a paragraph that I sent to Todd on this. This is probably more detailed than we want - there may be something better in Stu's testimony or from Todd's office (you may want to call over to Jonathan Adushek and get the final version of their talking points on this):

This new position is very similar to the President's announced position, because it is based on a redefined measure of net emissions. Previously, our target was based on the 1990 levels of a comprehensive basket of all six greenhouse gases, and it netted out the change in "sinks", or carbon-absorbing human activity. The new target uses instead a 1995 baseline for the three hydrofluorocarbons; with this new baseline, we can reduce to 1% below baseline emissions by 2008-2012 at the same level of effort as our announced position. The new target also does not net out the change in sinks, but rather only counts a limited set of sinks in the 2008-2012 period. Due to the slowing pace of reforestation in the U.S., our sinks are falling over time, so that by not netting out the change in sinks we make it much easier to meet a given target; with this new definition, we can reduce to 3% below baseline emissions by 2008-2012 at the same level of effort as our announced position. Thus, with this new definition, we can reach a reduction of 4% below 1990 levels with no new effort, so that our 7% reduction "on paper" is really, at most, a 3% increase in effort relative to the President's announcement. Moreover, while there is some ambiguity at this time over what the limited set of sinks that are included means for the U.S., our target is likely to be even easier to hit by benefitting from the sinks that do take place in the budget period. Thus, our final position is a reduction of, at most, 3% from our announced position, and probably less.

3) Page 9 - I don't see why you can't beef up the SO₂ discussion here - you can just lift what you had in earlier drafts (in the technology section) and move it to here.

4) Why do we have the paragraph on page 12 about how we are feeding EMF with data for their analysis? This seems to provide an implicit endorsement of EMF, and we may want to back off their results for other reasons later. Why do we need this paragraph? I would suggest we kill it.

5) I believe that we now have the administration consensus required to be a bit more forward leaning on the environmental effects of electricity restructuring on page 13-14. You can say more than just that costs to consumers will fall - you can say that there will be improved efficiencies leading to reduced emissions as well (Peter had some good language about this in his POTUS memo).

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RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 3-MAR-1998 00:39:49.00

SUBJECT: preliminary changes to the written testimony

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Following our discussions this morning, I have made the following changes to the written testimony:

Despite the difficulties, respected researchers have developed estimates of the monetary damages expected from an average worldwide temperature increase. For example, Cline estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of about 1.1 percent of GDP per year on the U.S. economy. That amounts to \$87 billion in today,s terms. (Cline,s original estimate is quoted in 1990 dollars. The figure given above translates this number into 1997 terms by scaling it to current GDP.) William Nordhaus of Yale University has likewise computed estimates of the dollar loss attributable to a doubling of greenhouse gas concentrations. Although he uses methods that differ from Cline,s in several respects, Nordhaus estimates that a slightly larger temperature change of 5.4 degrees Fahrenheit would impose losses equal to about 1 percent of GDP. A third independent estimate reported by Nordhaus is close to Cline,s. It must be noted, however, that this similarity among aggregated estimates masks the true uncertainty associated with forecasts of the damages from given increases in global warming -- the estimates are all fundamentally based on extrapolations from current and past experience, and may not fully incorporate effects that will unfortunately become apparent only with future experience.

The entire section on employment and aggregate output now reads:

Effects on employment and aggregate output

So far we have said nothing about job losses resulting from climate change policy. Although there may be job gains in some sectors and job losses in others, we do not anticipate any significant aggregate

employment effect if we achieve the conditions we have discussed. The effects on energy prices described above will occur only 10 to 14 years in the future. Not only are these effects small relative to historical variations in energy prices, and offset by other policies like electricity restructuring, they would occur sufficiently far in the future to enable monetary policy to keep the economy operating at its potential. In energy-intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors -- many of them high-tech jobs paying high wages. The President is firmly committed to assisting any workers who are adversely affected during the transition to a climate-friendly economy.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 3-MAR-1998 14:05:08.00

SUBJECT: Senate Agriculture Climate Change Testimony

TO: Adele C. Morris (CN=Adele C. Morris/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Sandra F. Daigle (CN=Sandra F. Daigle/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

Attached is the testimony for the Ag committee on Thursday. I have fixed
two minor problems pointed out by Zack and Mark. Otherwise it is
unchanged.===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

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T! 57NXXdd7TESTIMONYOFDR.JANETYELLEN CHAIR,COUNCILOFECONOMICADVISERSBEF
ORETHEU.S.SENATECOMMITTEEONAGRICULTURE,NUTRITION,ANDFORESTRYONTHEECONOMICSO

THE KYOTO PROTOCOL MARCH 5, 1998 Thank you, Mr. Chairman. The President has said that we can work to avert the grave dangers of climate change, while at the same time maintaining the strength of our economy. I agree and am pleased to have this opportunity to appear before the Committee to elaborate on the Administration's views on these issues. The international agreement that was reached in Kyoto this past December is a crucial step forward in addressing global climate change. But it is only one step in a journey. Since the international effort to reduce greenhouse gas emissions is still in some respects a work in progress, it is not yet possible to provide a full authoritative analysis of it. Many of the specifics in several crucial areas are not completely resolved in the diplomatic arena, forcing analysts to make a variety of assumptions about the ultimate form of the international regime. In my testimony today, I will attempt to identify key elements of the agreement and the Administration's policy, such as international emission trading, meaningful developing country participation, inclusion of land use activities that absorb carbon (sinks) and six categories of gases, as well as domestic initiatives, that together can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth. I will explain the reasoning underlying our conclusion that, under these conditions, economic impacts are likely to be modest. The Administration is strongly committed to ensuring that these key elements are reflected in our domestic and international climate change policies. We are firmly committed to meaningful developing country participation, the use of sinks to offset emissions requirements, and emission trading both domestically and internationally. And as you know, the President's FY 1999 budget includes a \$6.3 billion package of tax cuts and R&D investments over the next 5 years; this package makes good sense in terms of energy policy and will jumpstart our efforts. A final component of the President's climate change policy is his support for electricity restructuring in a manner that will offer approximately \$20 billion in cost savings to electricity consumers, while reducing greenhouse gas emissions. I. Basic Economic Rationale of the Kyoto Treaty To begin our analysis, it may be worth stepping back and examining the larger question of the basic rationale, from an economist's perspective, for the Kyoto Protocol. The earth's surface appears to be warming from the accumulation of greenhouse gases from myriad sources worldwide. None of these emitters presently pays the cost to others of warming's adverse effects, a classic externality in the language of economists. As a result of these distorted incentives, disruption of the Earth's climate is likely to proceed at an excessive pace and if left uncontrolled may pose substantial costs in terms of harm to commerce and the environment like. The fundamental economic logic of the Kyoto Protocol is that without such an international agreement, individual nations will not have the proper incentives to address

the threats from global climate change. P(

II. Costs of Climate Change In evaluating efforts to mitigate global warming, the first step is to consider the costs of inaction. These costs and they are significant provide the primary motivation for action to reduce greenhouse gas emissions. The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that the balance of evidence suggests that there is a discernible human influence on global climate. Current concentrations of carbon dioxide, methane, nitrous oxide, and the other so-called greenhouse gases have reached levels well above those of preindustrial times. Of these, carbon dioxide (CO₂) is the most important: net cumulative CO₂ emissions resulting from the burning of fossil fuels and deforestation account for about two-thirds of potential warming from changes in greenhouse gas concentrations related to human activity. Climatic Impact If global emissions continue unabated, the atmospheric concentration of CO₂ will likely double relative to its preindustrial level by midway through the next century and continue to rise thereafter. As a result of the increased concentration of CO₂, the IPCC estimates that global temperatures will increase by between 2 to 6 degrees Fahrenheit in the next 100 years, with

have the best guess of about 3.5 degrees Fahrenheit. While scientists believe that human activities are leading to a gradual warming of the average temperature of the earth, the change in temperature in a given region at a given time may differ substantially from this average. Indeed, models predict warming will be greater in high latitudes than in the tropics, and greater over land than over ocean.

4 Potential consequences associated with this shift in climate include a rise in sea levels, greater frequency of severe weather events, shifts in agricultural growing conditions from changing weather patterns, threats to human health from increased range and incidence of diseases, changes in availability of fresh water supplies, and damage to ecosystems and biodiversity.

Economic and Monetary Damages @ 4 The derivation of quantitative or monetary estimates of the damages from such a change in the climate is extremely difficult given the capacity of today's models. Estimates of the economic damages from climate change fall into the following broad areas: agriculture, sea level rise, air conditioning and heating, water supply, human life and health, air pollution, and other costs (hurricanes, relocation costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss). Although the quantification of these effects is quite demanding, researchers have developed estimates that prompt substantial concern. The IPCC reports that a doubling of carbon dioxide levels would lead to approximately 10,000 estimated additional deaths per year for the current U.S. population from higher summer temperatures, even after netting out the effects of warmer winters and assuming acclimatization. Other researchers have predicted sea level increases of about 20 inches by 2100, with greater increases in subsequent years.

4 Despite the difficulties, researchers have developed estimates of the monetary damages expected from an average worldwide temperature increase. For example, William Cline, then of the Institute for International Economics, estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of about 1.1 percent of GDP per year on the U.S. economy. That amounts to \$89 billion in today's terms. (Cline's original estimate is quoted in 1990 dollars. The figure given above translates this number into 1997 terms by scaling it to current GDP.) William Nordhaus of Yale University has likewise computed estimates of the dollar loss attributable to a doubling of greenhouse gas concentrations. Although he uses methods that differ from Cline's in several respects, Nordhaus estimates that a slightly larger temperature change of 5.4 degrees Fahrenheit would impose losses equal to about 1 percent of GDP. A third independent estimator reported by Nordhaus is close to Cline's. It must be noted, however, that this similarity among aggregated estimates masks the true uncertainty associated with forecasts of the damages from given increases in global warming; the estimates are all fundamentally based on extrapolations from current and past experience, and may not fully incorporate effects that will unfortunately become apparent only with future experience.

4 One key difficulty in interpreting a net monetizing these estimates of damages is uncertainty over the extent that they should be discounted because they occur in the distant future. Since the benefits of stemming future climate change accrue over not only decades but centuries, small changes in the discount rate can produce substantial changes in the results. But the precise discount rate that should be used to evaluate questions as important as the future climate of the planet remains a subject of intense debate. It is safe to say that there is, as yet, no professional consensus on the issue. Indeed there can be no technical answer to the ethical question how we should value the welfare of future generations.

4 A similar difficulty with such estimates is that they do not include potential nonlinearities in the relationships between greenhouse gas concentrations and temperature, between temperature and economic damages, or in the various other complicated relationships governing interactions between greenhouse gas emissions, the climate, and the economy. Current estimates of damages do not, and cannot, accurately reflect the value of reducing the unknown risk of large scale and potentially irreversible discrete events with potentially catastrophic consequences.

4 Two such possibilities serve as illustrations. Warming of Northern tundra may release huge amounts of methane from the permafrost, thereby leading to accelerated warming. We do not know at what point, if any, such potentially unstable activity would be triggered. Second, evidence from climate models suggests that some types

of climate change may lead to changes in ocean currents, including weakening of the Gulf Stream that warms Western Europe. Scientific evidence suggests that abrupt seawater temperature shifts have occurred over periods as short as decades.⁴ To what extent are we willing to take such chances with our planet? There is a strong argument for the Kyoto Protocol as a form of plan-
et insurance. But what numerical weight should be assigned to these catastrophic risks? In other words, what is the value of the insurance policy? Although it is difficult for an economist, or anyone, to know, reductions in the risk of such catastrophic outcomes must be considered in addition to the costs and benefits that can be reasonably quantified. Since human beings are typically averse to risk, such catastrophic risks are especially important in evaluating whether the benefits of a particular climate control policy justify the costs. One must have at least some sympathy with those who criticize economists on the grounds that the effects of climate change are extremely difficult to quantify in a single monetary number. III. Addressing Global Climate Change in an Efficient Manner⁴ The costs of unabated climate change may thus be difficult to quantify, but they are P

nonetheless real and provide the motivation for reducing greenhouse gas emissions. In taking action to reduce those emissions, economic analysis suggests that two elements are absolutely essential: "04 The effort must be global, to address the global externality inherent in the nature of the problem.

4 (#4 (# "04 The effort must be flexible and market based, to ensure that we achieve our objectives in the most efficient manner possible.

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d for Global Action P 4 Climate change is a global problem requiring a global solution. As I mentioned 0 earlier, no single country has an incentive to reduce emissions sufficiently to protect the global environment against climate change. Each has an economic incentive to free-ride on the efforts of others. Even if the United States sharply reduced its emissions unilaterally without an international agreement limiting emissions abroad, greenhouse gas emissions from all other countries would continue to grow, and the risks posed by climate change would not be significantly reduced. It is important to emphasize that emissions of different gases anywhere in the world have very similar effects on global climate.⁴ The threat of disruptive climate change has led to coordinated international efforts to reduce the risks of global warming by reducing emissions of greenhouse gases. A landmark international agreement to address global warming was the Framework Convention on Climate Change signed during the Earth Summit in Rio de Janeiro in 1992. This convention established an objective of limiting greenhouse gas concentrations and called upon industrial countries to return their emissions to 1990 levels by 2000. Since then, it has become clear that the United States and many other participating countries will not meet this voluntary goal; quite the contrary, emission levels have continued to rise not fall among both developed and developing countries.⁴ To address the lack of progress among many industrialized countries toward meeting the Rio objective, the United States and approximately 160 other nations agreed in negotiations held in Kyoto, Japan, last December, to reduce emissions of greenhouse gases. The Kyoto Protocol, which requires the advice and consent of the Senate, would place binding limits on each industrial country's combined emissions of the six principal categories of greenhouse gases: carbon dioxide (CO₂), nitrous oxide (N₂O), methane, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries.⁴ Under the Kyoto Protocol, each industrial country's baseline is its 1990 emissions of CO₂, methane, and N₂O and its choice of 1990 or 1995 level of the other three categories of greenhouse gases. The United States agreed to a target of 7 percent below this baseline by the period between 2008 and 2012. XXXX Given the changes in the definition of the baseline for the three long-lived chemical compounds (HFCs, PFCs and SF₆) from 1990 to 1995 combined with changes in how waysinks are accounted for in the baseline, the actual reduction required in the U.S. is no more than 2-3% more than the President originally proposed as the U.S. negotiating position. #XXXXNR; # The targets for the European Union and Japan are 8 percent and 6 percent below

1990 levels, respectively. Australia, New Zealand, Norway, Russia, and Ukraine all have limits somewhat less ambitious when phrased as cuts relative to their 1990 levels. In sum, over the period from 2008 to 2012, the industrial countries are expected to reduce their average emission of greenhouse gases to about 5 percent below their 1990 levels. XXN`

XNX4 The President has made clear that he will not submit the Kyoto Protocol to the Senate without meaningful participation from key developing countries (who are not included in Annex I). 4 There are several reasons why meaningful participation from developing countries is essential. First, developing countries are projected to contribute a majority of world emissions around 2030 under a continuation of business as usual. Without the participation of developing economies, efforts by the industrialized countries to limit emissions will be the far from adequate protection from climate change. 4 Second, developing country participation is crucial because it would permit relatively low cost emissions reductions to be internationally recognized as a substitute for more expensive emissions reductions that might otherwise be achieved domestically by U.S. companies and those in other industrialized countries. Since greenhouse gas emissions have the same basic "impact on the climate regardless of where they occur, emission reductions in developing countries have the same environmental benefits as reductions in the U.S. But these reductions are much less costly than reductions in the U.S. or in other developed nations, because of the very inefficient and carbon intensive uses of energy in these countries today. It thus makes sense, from both an environmental and an economic perspective, to incorporate emissions reductions in developing countries into the international system. 4 Third, principles of basic fairness suggest that all countries should do their part, depending, in part, on their ability to contribute to the solution. Thus even poor countries should participate, although the lack of resources in such countries may limit the extent of their participation. 4 Some have expressed fear that the Kyoto Protocol might adversely affect the competitive position of American industry. Evaluating how the Kyoto Protocol could affect competitiveness of a few specific manufacturing industries especially those that are especially energy intensive, such as aluminum and chemicals is complex. The answer depends, in part, on the impact of the agreement on energy prices, which we will shortly address. In general it is difficult to undergo a structural change in the economy without having the effect of expanding some sectors and contracting others. But to provide some perspective on this issue, consider the following facts. First, on average, energy constitutes only 2.2 percent of total costs to U.S. industry. Second, energy prices already vary significantly across countries. According to the 1997 Statistical Abstract, for example, in 1996 premium gasoline cost \$1.28 per gallon in the United States but only 8 cents per gallon in Venezuela. Similarly, gas prices were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. Electricity prices also vary significantly: in the U.S. they were 5 cents per kilowatt hour in 1995, a fraction of prices in Switzerland of 13 cents per kilowatt hour. Yet U.S. industry is not moving en masse to Venezuela, nor is Swiss industry moving to the United States. Third, roughly two thirds of all emissions are not in manufacturing at all, but in transportation and buildings, sectors which, by their very nature, are severely limited in their ability to relocate to other countries. We therefore believe we need developing country participation because the problem is global and cost effective solutions are essential, than to avoid adverse effects on competitiveness. Flexibility and Market Mechanisms P

4 A global solution is thus critical to the global problem of climate change. Globalizing the solution is not, however, enough by itself. We must also ensure that our reductions in effort to reduce global greenhouse gas emissions are accomplished in the most efficient manner possible. The nature of the climate change problems suggests three basic methods to lower costs of achieving given levels of environmental protection. They can be characterized in terms of three categories of flexibility: (1) when flexibility; (2) what flexibility; and (3) where flexibility, which may be the most important of all. Such methods have long been championed by economists interested in increasing the efficiency of protection. Indeed, over 2,500 economists from academia, industry, and government alike urged such approaches in a letter they signed last year advocating action on climate change: 04 Economic studies have found that there are many potential policies to reduce greenhouse gas emissions for which the tot

al benefits outweigh the total costs... The most efficient approach to slowing climate change is through market-based policies.

4/#4(# 1. When flexibility (timing) 4 First is when flexibility or timing. Since climate change is a long-term problem, the exact timing of emissions reductions is, within some range, not of primary importance. Thus the freedom to delay or accelerate reductions within an agreed-upon time frame while ensuring credibility of emissions reductions lowers costs. , '* 4 As a result of U.S. leadership, the Kyoto Protocol incorporates this principle of when flexibility in four ways: "04 First, the initial emissions reductions are less severe, and the period over which they p occur ends much later than what had been proposed by many other countries. By adopting a gradual and credible path of reductions in the early years, we can greatly 0 reduce costs such as those from prematurely scrapping coal-fired electricity plants, while attaining the same ultimate environmental goals.

4/#4(# "04 Second, under the Kyoto Protocol, the emission target is not specified in terms of a

specific year, but rather in terms of an average over a five-year period (2008-2012).

Averaging over five years, instead of requiring countries to meet a specific target each year, can lower costs, especially given an uncertain future. The averaging can smooth out the effects of short-term events such as fluctuations in the business cycle and energy demand, or hard winters and hot summers that would increase energy use and emissions.

4/#4(# "04 Third, there is allowance for banking emission reductions within the 2008-2012 @ commitment period, for use in a subsequent commitment period [although the emission target of the subsequent period has not yet been specified].

4/#4(# "04 Fourth, CDM credits achieved between 2000 and 2008 may be banked until 2008 to \$" 2012.

4/#4(# 2. What flexibility (gases and sinks)

4 These second type of flexibility is what flexibility, along two dimensions. XNXXXN The first is 0*%(the inclusion in the agreement of all six greenhouse gases. Emissions of different kinds of gases, , '* not just carbon dioxide, contribute to the greenhouse effect. Since the IPCC has developed conversion factors for all greenhouse gases by estimating their global warming potentials, reductions in emissions of one gas can be used to substitute for increases in emissions of another by an amount that has equivalent environmental effects. Again at U.S. urging, all six gases are included, while Japan and the EU had insisted until the end on covering only three. Thus the U.S. succeeded in having the Kyoto Protocol stipulate that countries with binding targets are to reduce their total greenhouse gas emissions by certain percentages, but does not require specific @ reductions for specific gases. Since a molecule of sulfur hexafluoride is 23,900 times more potent over 100 years than a molecule of CO₂, it may be cheaper to achieve the same environmental benefit by eliminating one molecular unit of SF₆ than nearly 24,000 units of CO₂. 4 Some initial analysis indicates that a strategy of reducing non-CO₂ greenhouse gas p emissions by a greater percent than CO₂ emissions could lower carbon emissions permit prices by as P much as 10 percent. Thus allowing countries flexibility in what gases they reduce essentially trading emissions reductions across gases can help lower significantly the cost of meeting their targets. 4 The second source of what flexibility is the treatment of sinks, i.e., land use activities that promote the removal of carbon from the atmosphere through the growth of plants. At the urging of the U.S. delegation, sinks can be used to offset emission targets. Promoting such sinks through afforestation and reforestation may reduce atmospheric concentrations of CO₂ p & !\$ at much lower costs than reducing emissions of greenhouse gases. XNXX XN3. Where flexibility (international) 0*%(4 The third type of flexibility, and perhaps the most important, is where flexibility , '* (international). As I have already emphasized, emissions have the same environmental consequences regardless of where in the world they occur. Therefore, the least-cost approach to controlling climate change is to reduce emissions wherever such reductions are cheapest. The Kyoto Protocol, because of U.S. insistence and persistence, includes three important cost-saving pr

provision of this nature."04 First, it provides the opportunity for countries that take on binding targets to trade

rights to emit greenhouse gases with each other. This market in emissions permits could ensure that emissions reductions occur where they are least expensive within the industrial countries. In particular, U.S. companies could purchase emissions reductions in other participating countries when doing so would reduce their costs thus lowering costs without affecting the level of environmental protection. While currently only industrialized countries have emissions caps, this mechanism also offers an incentive for developing countries to take on emission targets.

4 (#4 (# "04 Second, the agreement provides for Joint Implementation by Annex I countries. Thus if some countries do not develop programs to trade permits internationally, U.S. firms could nonetheless implement projects in those countries for which they could receive emissions reductions credits in the U.S.

4 (#4 (# "04 Third, the agreement allows industrial countries to invest in clean development " projects in the developing world and use these projects' certified emissions reductions toward meeting their targets. Many such clean development projects may be quite cheap in terms of the cost per ton of emission saved, as has been illustrated by the Joint Implementation pilot program that is already in place in the U.S., " *4 (# 4 Detail of how these provisions will operate will be discussed in future negotiations such as the one in Buenos Aires later this year. Nonetheless, effective international trading of emission credits, Joint Implementation, and the Clean Development Mechanism can lead to substantial reductions in costs relative to alternative policies that do not exploit the power of market incentives. To illustrate briefly the ability of U.S. industry to perform beyond expectations when given appropriate economic incentives, consider further EPA's highly acclaimed sulfur dioxide (SO₂) program, which relies, among other things, on a system of @ tradeable permits to reduce emissions of SO₂ from electric utilities. The SO₂ program has been

successful in several ways: a large number of utilities participate, SO₂ emissions and ambient concentrations have fallen and the costs of reducing emissions are considerably lower than originally forecast. 4 As has been frequently noted, the average cost of SO₂ emissions reductions has P recently been significantly lower than was originally forecast, in part due to the role of incentives in fostering innovation. Emission permit prices, currently at approximately \$100 per ton of SO₂, are well below earlier estimates of around \$250 to \$400 per ton. 4 Trading programs may not always bring cost savings as large as those achieved by the SO₂ program; trading programs will not always be accompanied by the discovery of much " cheaper control strategies. However, the SO₂ experience demonstrates clearly how programs like " international permit trading, Joint Implementation, and the Clean Development Mechanism will

lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs. XN XXXN P (# & # XN XXXN t #

IV. Difficulties of Economic Analysis of the Kyoto Protocol 4 Now that we have a Protocol even if it is not yet fully complete nor ready for the President's submission to the Senate it is possible to examine it in somewhat more detail from an economic perspective. But, once again, the inherent limitations of any such estimates deserve emphasis. Such limitations should not be surprising to you: economists have a difficult enough time projecting the behavior of the economy over the next quarter or year, let alone over the next two decades. The scale of the forecasting exercise is therefore daunting, and any specific results should be treated with substantial caution. 4 The difficulties associated with the economic analysis of climate change fall into three broad categories. First are the uncertainties that still remain over the terms of the ultimate treaty, necessitating assumptions on which the analysis is predicated. Second are the inherent limitations of available models to analyze even short-term costs and benefits. And finally is a topic discussed earlier: the impossibility of putting a single monetary

umber on the long term benefits of climate change mitigation, although there will clearly be economic benefits of emission reductions. Uncertainties in the International Effort to Combat Climate Change " 4 The Kyoto Protocol was an historic accomplishment, delineating the broad terms of the international effort to address climate change. But although we know a lot more than we did before Kyoto about how that international system can work, and that in formal analysis, there is still much that we do not know. 4 First, some provisions raise complex implementation issues. A tissue here is the , '* treatment of so-called sinks activities that affect the rate at which carbon is removed from the atmosphere and sequestered, e.g., by the planting of trees. 4 Second, the details of a number of items primarily concerning international trading, the Clean Development Mechanism, and developing countries are the subject of further discussions including future negotiations in Buenos Aires next fall, because they have not been definitively settled by the end of the Kyoto talks. 4 Finally, and most importantly, we have not yet negotiated international agreements to limit emissions beyond the 2012 window. The emission cuts agreed upon at Kyoto are only a first step on a long journey. The first step that we propose to take over the next 15 years is critical. But the reason it is critical is not that, by itself, it will solve the climate change problem emissions during any given decade are small compared to the cumulative concentrations in the atmosphere. Rather, the first step is critical because we cannot take the second and third steps until we have taken the first. At the same time, any analysis is complicated by the lack of knowledge over what the subsequent steps will be. Inherent Limitations of Models @ 4 In addition to these uncertainties about the details of the international effort to address climate change, are the inherent limitations of the models used to evaluate that effort. Even with a given model, answers depend critically on the precise nature of the question asked. For example, the costs of emissions reduction depend critically on the extent of global participation and international trading that a treaty is assumed to feature. But in addition to the dependence of the results from a given model on the precise assumptions, different models can give different answers even when all the assumptions are specified to be the same a concrete illustration of , '* the range of uncertainty to which we must assign the predictions of any one individual model. 4 One area in which the uncertainty is particularly large is the pace of technological progress especially the diffusion of existing energy efficient technologies, but also the development of new technologies and the extent to which the pace will accelerate in response to government programs. Models and expert opinion on climate change policy tend to have a wide range of disagreement on the scope for speeding the diffusion of existing energy efficient technologies than on any other single issue. 4 Furthermore, each model has strengths and weaknesses; each has questions to which it is better or worse suited to answer. Some, for example, model the energy sector in detail. Some allow for the fact that a coal fired power plant cannot costlessly be converted to one that runs on natural gas. Some show the effects of hypothetical tax cuts made possible by the new revenues earned through the auction of emissions permits. Some are capable of showing recessions and booms. Others include a long term carbon cycle model that can keep track of the accumulation of greenhouse gas concentrations in the atmosphere and their climatological effects. Some break down the rest of the world into regions and so can model international trade. No one model does everything, and therefore we must not rely blindly on the results of any one model or set of models. Professional judgement and economic intuition, along with diplomatic assessments, are also crucial. Benefits of Averting Climate Change p & ! \$ 4 As discussed above, it is evident that the benefits of averting climate change are potentially immense. But we have chosen not to try to quantify them in monetary terms, in light of the difficulties we have enumerated. These include the uncertainty of these benefits, their , '* timing and therefore the extreme sensitivity of the results to the chosen discount rate, and the dependence of benefits on emissions paths after the 2008 to 2012 budget periods specified in Kyoto. V. Assessing the Kyoto Protocol 0 4 In order to evaluate the likely net economic impact of the Kyoto Protocol, excluding the benefit of mitigating climate change itself, we have drawn upon a variety of tools to assess @ the various possible costs and non-climate benefits of the Administration's emissions reduction policy. To give away the punchline, our conclusion is as follows: the net costs of

our policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and we are successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism in future negotiations. That potential small net premium, even excluding the benefit of mitigating climate change, in effect, purchases a partial insurance policy against a serious environmental threat.⁴ Because the results from any model must be treated with caution, the Administration has employed a broad set of economic tools to assess the Kyoto Protocol. We have drawn on the insights of a wider range of models of the energy sector and economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, the work of the OECD on Economic Dimensions and Policy Responses to Global Warming, and the staff level Interagency Analytical Team analysis produced last year. Other tools include simpler relevant statistics, metaanalyses such as work by the World Resources Institute, models, and basic economic reasoning. Drawing on this broad array of analytical tools is crucial to an intelligent evaluation of the policy alternatives.⁴ To our knowledge, no model whether used inside the government or not has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old and remains unfinished. In particular, no model is currently designed to assess Kyoto treatment of sinks, or all six greenhouse gases. Some model builders outside the government tend to take as long as several years to incorporate changes in policy parameters into their models.⁴ Our thinking has been informed, however, by simulations conducted with the Second Generation Model of Battelle Laboratories, one of the leading models in the field. The SGM is one of the models best positioned to analyze the role of international trade in emission permits, which we consider to be a critical element of the Kyoto Treaty. However, the SGM does not cover all six gases included in the Kyoto Protocol or include a role for sinks. We have used the SGM model as one input into our overall assessment of the Kyoto Treaty, but have attempted to supplement its results with additional analysis to account for such special features of the agreement as the inclusion of six gases, a possible trading arrangement that could include as a subset of the Annex I countries and the Clean Development Mechanism. We will share with you today some preliminary results of this analysis. To the extent possible, we have compared results obtained with the SGM model with those of other modelling efforts.⁴ Mindful of the limitations of any single model, we are eager to see features of the Kyoto Protocol assessed by other models to obtain a better feel for the range of possible effects. This work is just beginning and much of it will continue to go on outside the government. For example, the Energy Modeling Forum, based at Stanford University, is a long running model comparison exercise involving many of the leading climate models. EMF is currently studying how features of the Kyoto legal language can be translated into terms recognizable to economic modelers. We expect that the group will conduct a full scale analysis of the Kyoto Protocol. The Energy Modeling Forum believes that its members will need at least until midyear to update their results. VI. Assessing the Potential Costs of Emissions Reductions⁴ I said in Congressional testimony last July that we can do this smart or we can do this dumb. I was referring to the point that the costs of cutting emissions can be much reduced if flexible, market based mechanisms are used. Our economic analysis highlighted the importance of such flexible, market based mechanisms which are therefore reflected, at the President's insistence, in the Kyoto Protocol and our ongoing diplomatic strategy.⁴ Within the Kyoto Protocol, this means an insistence on international trading, Joint Implementation, the Clean Development Mechanism, and, ultimately, on meaningful developing country participation. Domestically, this means that we implement any emissions reduction through a market based system of tradeable emissions permits, which ensures that we achieve "reductions wherever they are least expensive. But this also means taking serious and responsible steps in the short run to prepare us to meet our obligations in the longer term.⁴ The first such step is the inclusion in this year's budget of a aggressive, \$6.3 billion program of tax cuts and R&D investments \$1.3 billion more than the \$5 billion package the President promised in his October 22 speech on this issue. The goal is both to stimulate the development of new energy saving and carbon saving technologies and to encourage the dissemination of those that exist already. The proposed package contains \$3.6

billion over the next 5 years in tax cuts for energy efficient purchases and renewable energy, including tax credit of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles, a 15 percent credit (up to \$2,000) for purchases of rooftop solar equipment, a 20 percent credit (subject to a cap) for purchasing energy efficient building equipment, a credit up to \$2,000 for purchasing energy efficient new homes, an extension of the wind and biomass tax credit, and a 10 percent investment credit for the purchase of combined heat and power systems. The package also contains \$2.7 billion over the next 5 years in additional research and development investments covering the four major carbon-emitting sectors of the economy (buildings, industry, transportation, and electricity), plus carbon removal and sequestration, Federal facilities, and crosscutting analyses and research. One example of the R&D effort is the Partnership for a New Generation of Vehicles (PNGV). PNGV is a government industry effort to develop attractive, affordable cars that meet all applicable safety and environmental standards and get up to three times the fuel efficiency of today's cars. In FY99, the combined proposal for PNGV is \$277 million, up from \$227 million appropriated in FY98. Similar government industry efforts are proposed to develop more efficient diesel engines for both light trucks and heavy trucks.

4. A second responsible step entails industry by industry consultation to prepare emission reduction plans in key industrial sectors. The Administration will work in partnership with industry to identify ways in which the Federal government might remove regulatory hurdles that discourage energy efficiency. In addition, DOE will spearhead a comprehensive effort to improve the energy efficiency of the Federal government's own operations and purchases.

4. The third step is the promotion of an environmentally responsible electricity restructuring bill, which the President identified as part of his domestic climate change package in his address to the National Geographic Society on October 22. A electricity sector freed from government regulation would be a more efficient energy sector. Costs to consumers would fall. In addition, stronger incentives for improved generation efficiency in conjunction with appropriate market based provisions could achieve modest reductions in emissions. A reasonable overall estimate of the contribution of federal electricity restructuring to the rest of the President's program to address climate change is that it would make further progress to the same emission reduction goals at a cost saving of roughly \$20 billion per year. These steps should be taken regardless of Kyoto, because they make sense in terms of energy efficiency. But they have the added benefit of preparing us for Kyoto. Estimated Reduction in Costs from Annex I Trading

4. In the language of the treaty, Annex I, is the set of countries that have agreed to take on binding limitations in emissions of greenhouse gases. Even without meaningful developing country participation which, again, the President has emphasized is essential before the treaty would be submitted for ratification costs could be reduced substantially by emission trading among the Annex I countries. To provide some indication of the possible efficiency improvements, Russia and Ukraine consume six times as much energy per dollar of output as does the United States. Such large international differences in energy efficiency suggest that adoption of existing U.S. technology would yield very large emissions reductions in these countries.

4. Estimates derived from the SGM model confirm that emission trading among Annex I countries can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half relative to a situation in which such trading was not available. This concept of cost savings is meant to capture aggregate resource costs to the U.S. economy, including the cost to domestic firms of purchasing emission permits from other countries where emission reductions may be cheaper than in the United States. Although these estimates reflect idealized international trading in efficient markets, the overall conclusion is clear. The dramatic reduction in costs potentially available from Annex I trading within the SGM model cutting the costs involved by half highlights why the President insisted that international trading be part of the Kyoto Protocol; and why its achievement by our negotiators in Kyoto was such an important accomplishment. Estimated reduction in costs from umbrella trading

4. One possibility that emerged in Kyoto, which none of us foresaw, was the idea developed thereby by the U.S. delegation, that the United States might undertake trading with a subset of Annex I countries, dubbed the umbrella. Countries that have expressed interest in the umbrella include the United

States, Australia, Canada, New Zealand and Russia, with strong indications of interest from some others. This subset of Annex I countries shares a common interest in promoting market-based mechanisms, most specifically, fully flexible rules for international trading of emission permits. It is too early to state the precise form the umbrella will take. But we can envision a number of potential benefits. The umbrella could, for example, greatly reduce costs to the U.S. Results that we have derived from various SGM simulations of efficient international trading suggest that, relative to the situation in which there is no trading at all, the umbrella can reduce costs by an estimated 60-75 percent, depending on whether the former Warsaw Pact countries fall within the umbrella. The Kyoto Protocol classifies these countries outside of the EU bubble for the first budget period 2008-2012. Estimated reduction in costs from developing country participation

4 The next consideration is participation by developing countries. The President has said that he will not submit the treaty for ratification without meaningful participation by key developing countries. Such participation would further reduce the costs involved. 4 The substantial potential gains from meaningful developing country participation are highlighted by the significant benefits that will likely accrue from the limited role that the developing countries have already agreed to: the Clean Development Mechanism (CDM), modeled after the U.S. joint implementation concept. The CDM cannot realistically be expected to yield all the gains of binding targets for developing countries, but it might save costs by roughly another 20 to 25 percent from the reduced costs that result from trading among Annex I countries. 4 Another possibility is that we persuade some of the key developing countries that are the largest emitter to commit to targets, and allow us to buy emission reductions from those paths. Simulations with the SGM models suggest that full participation by non-Annex I countries could cut roughly 55 percent off the reduced costs that result from Annex I trading. The actual cost reduction would depend on the extent of developing country participation that is ultimately obtained, as well as the effectiveness of international trading arrangements. The more participating developing countries that take on modest binding targets and trade in international permit markets, the lower will be costs. 4 These cost-saving opportunities are fundamental tenets of the U.S. position. The promise of Kyoto cannot be achieved without effective emission trading. Moreover, if we do not get meaningful participation by key developing countries, we won't submit the treaty for ratification to the Senate. So, while our analysis may be predicated on some ambitious conditions concerning trading and developing country participation, it is exactly those conditions that form the foundation of the U.S. position in international negotiations including those at Buenos Aires. Accounting for Carbon Sinks

4 The preceding discussion has emphasized the importance of trading arrangements and the CDM. In reaching an overall economic assessment, it is also important to factor in the potential role of carbon sinks. Again, the U.S. delegation obtained a novel concept, that carbon absorbing activities called sinks could be used to offset emissions. The arrangements concerning carbon sinks in the Kyoto Protocol have received less attention than they merit. The Kyoto Protocol specifies that removal of CO₂ by sinks count toward meeting the target. The Kyoto Protocol counts the net emission effect of three sink activities: afforestation, reforestation, and deforestation. Very preliminary estimates of the implications for the United States of the Kyoto provisions on sinks indicate that carbon sinks could comprise a significant portion of the total required emissions reductions. Moreover, decreasing the required emissions reduction by, for example, 10% would likely result in cost savings greater than 10%.

p&!\$

4 Even this estimate of the effect of sinks is conservative in one respect: it is based on an assumption for sink activity in the U.S. over the 2008-2012 period, and no assumed benefits from sinks elsewhere in the world. Very preliminary estimates suggest that incorporating the gains from sinks throughout the world can substantially reduce the costs of meeting the Kyoto target, on top of the gains from trading among Annex I countries. (Furthermore, no model has yet tried to take into account that government policies can help increase the act

ivities qualifying as allowable sinks, like some tree planting.) Because the quantitative uncertainty is so large, we do not yet have an estimate with which we are comfortable. But we expect that complete modelling of the Kyoto provision pertaining to sinks will likely have favorable and potentially large effects on projected costs. Accounting for the role of improvement in energy efficiency

4 Another issue in analyzing the Kyoto protocol concerns future improvements in energy efficiency due to innovation and diffusion of existing technology. The parameter that figures most prominently in an analysis of energy efficiency is the rate of improvement in the so-called Autonomous Energy Efficiency Index (AEEI), that is the rate at which the total use of energy falls relative to GDP. A plausible assumption on the AEEI is an improvement of 1.0 percent per year. Reflecting a conservative interpretation of the 15 year impact of various climate change initiatives, this is only a small increase above the 0.9 percent number in the Energy Information Administration's Annual Energy Outlook. That assumption is not the most optimistic outcome that might occur. Some authorities in the field of energy policy forecast more rapid technological progress. Experts at five national laboratories managed by the Department of Energy, using an engineering approach rather than an economic paradigm, found that a third of the emissions reductions necessary to return to 1990 levels by 2010 could be achieved through the adoption of existing energy efficient technologies at no net resource cost, or even some savings. The National Academy of Sciences reached qualitatively similar conclusions in a 1992 report.⁴ The President's FY 1999 budget, as I have noted, includes a \$6.3 billion package of tax cuts and R&D investments intended to spur the discovery and adoption of new technologies. If the Administration is successful in this effort, the rate of improvement in energy efficiency could rise and such improvements would lower the cost of meeting our Kyoto target. For example, published results based on SGM model simulations with different assumed rates of AEEI suggest that an increase in the AEEI of 25 percent could lead to declines in the permit price of approximately 40 percent.⁴ Our justification for incorporating into our assessment a small assumed impact of Administration technology policies is somewhat analogous to the Administration's rationale for employing mainstream economic assumptions in our budget forecasts: in the presence of uncertainty, we are conservative in our estimates of the speed with which the economy will grow, tax receipts will rise, and the budget will improve. That way, any revisions or surprises that occur are likely to be in the pleasant direction. In this instance, we prudently and conservatively assume that there will be substantial delays between investments in new technology or the diffusion of existing technology, and the return to such investments.⁴ Moreover, at the recent automobile show in Detroit, General Motors announced that it has developed a hybrid based vehicle that can achieve fuel efficiency of 80 miles per gallon, and that this car could be in commercial production within a few years. Ford also exhibited a prototype of a light weight highly fuel efficient sedan that could be in commercial production by the middle of the next decade. These announcements followed an earlier breakthrough announced by DOE and its partners of a fuel cell that could run on gasoline and double current fuel economy while reducing conventional air pollution emissions by 90 percent. These technological advances have been made possible through the efforts of the Partnership for a New Generation of Vehicles between the Administration and the U.S. auto companies and their suppliers.⁴ Such progress may be replicated in other sectors. VCRs and TVs, while switched off, consume about \$1 billion worth of electricity annually. EPA has established a partnership with major manufacturers that has a goal of achieving up to a 70 percent reduction in energy use by VCRs and TVs while they are switched off, without sacrificing product quality, usefulness, or increasing costs. This partnership offers promise of substantial improvements in energy efficiency. Non-Climate Benefits p 4 A final factor that should be included in any comprehensive assessment of the economic implications of the Kyoto protocol are the benefits of the agreement. The literature has emphasized that any relative price shift that proves necessary to reduce emissions should produce non-climate benefits in three areas: traffic congestion, highway accidents, and air pollution unrelated to climate change. These benefits are hard to quantify precisely but are potentially significant: our rough estimate suggests that these three benefits could offset approximately a quarter of the resource cost

of the climate change policy. Synthesis p&1\$ 4 A comprehensive evaluation of-` h4X-the economic impact of the Kyoto Protocol must integrate all of the factors described above: reliance on flexible market-based mechanisms domestically; international trading and Joint Implementation among Annex I countries; the Clean ,`* Development Mechanism; meaningful developing country participation; the potential cost mitigating role of including six gases and land carbon sinks; the benefits of electricity restructuring; and emissions reductions achieved as a consequence of other proposed Administration climate change initiatives. Assuming that effective mechanisms for international trading, Joint Implementation and the Clean Development Mechanism are established, and assuming also that the U.S. achieves meaningful developing country participation, our overall assessment is that the economic cost to the United States in aggregate and to typical households of attaining the targets and timetable specified in the Kyoto Protocol, will be modest. This conclusion that the impact will be modest is not entirely dependent upon, but is fully consistent with, formal model results. I have previously emphasized the limitations of relying on any single model in assessing the economic impact of the Kyoto Protocol, and continue to view any such results as just one input into an overall analysis. But it is worth emphasizing that model results reflecting the details of the Kyoto Protocol are consistent with our conclusion. For example, under the assumption of either trading under the umbrella or within Annex I, the CDM and permit trading with developing countries, estimates derived using the SGM model, which had just for the inclusion of six gases and assumed a little banking of credits beyond 2012, suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to \$7 to \$12 billion per year in 2008 to 2012. This implies that overall costs, excluding not only climate and nonclimate benefits, but also such cost mitigating factors as sinks and payoffs from the President's electricity restructuring and climate change initiatives, would reach roughly one tenth of one percent of projected GDP in 2010. A more tangible measure of costs is the estimated effects on energy prices. Excluding the ,`* impact of electricity restructuring and the ancillary benefits of mitigation and better forest management, the SGM based estimate, corresponding to the gross resource cost estimate cited above, is an emissions price in the range of \$14 to \$23 per ton of carbon equivalent. This translates into an increase in energy prices between 2008 and 2012 at the household level of between 3 and 5 percent, an increase in fuel oil prices of about 5 to 9 percent, natural gas prices of 3 to 5 percent, gasoline prices of 3 to 4 percent (or around 4 to 6 cents per gallon), and electricity prices of 3 to 4 percent. This increase in energy prices at the household level would raise the average household energy bill in ten years by between \$70 and \$110 per year, although such predictions may not be observable because they would be small relative to typical energy price changes, and nearly fully offset by electricity price declines from Federal electricity restructuring. In particular, this increase in energy prices is small relative to the average of year p to year real energy price changes experienced by U.S. consumers since 1960: such annual P changes have averaged 3.8 percent. In addition, by 2008-2012, the anticipated 10 percent decline in electricity prices from the restructuring that is part of our climate change agenda is projected to lead to expenditure reductions of about \$90 per year for the average household.

As highlighted earlier, there are substantial but unavoidable uncertainties surrounding estimates like these. For example, the estimate just discussed is predicated, among other things, on the developing country participation that we are insisting upon as a condition for our ratifying the Kyoto Protocol, but which is not yet part of that Protocol, and on effective international trading. Moreover, other models will yield other answers and much work remains to be done by the modeling community to test the robustness of these results. Preliminary comparisons of the SGM model to the few other models that have attempted to evaluate the Kyoto accord, suggest ,`* that its predictions concerning the impact of the Kyoto Protocol on carbon permit prices are neither the most conservative nor the most optimistic of the models that have been developed. The predictions of the SGM model are robust in the sense that virtually all energy models reveal the potency of effective, flexible, domestic and international trading mechanisms to reduce substantially the cost and energy price impact of meeting the Kyoto targets.

ts. Of course, the most important factor that has been left out of the above assessment is the benefit of mitigating climate change itself. A full cost benefit analysis would include mitigation in the benefits column. The only reason we have not done so, explained repeatedly above, is the difficulty in coming up with a number to capture the monetary benefits. But nobody should lose sight of our ultimate objective: keeping our planet the hospitable home that weenjoy today. Effects on employment and aggregate output p So far we have said nothing about job losses resulting from climate change policy. P Although there may be job gains in some sectors and job losses in others, we do not anticipate any significant aggregate employment effect if we achieve the conditions we have discussed. The effects on energy prices described above will occur only 10 to 14 years in the future. Not only are these effects small relative to historical variations in energy prices, and offset by other policies like electricity restructuring, they would occur sufficiently far in the future to enable monetary policy to keep the economy operating at its potential. In energy intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors many of them high tech jobs paying high wages. The President is firmly committed to assisting any workers who are adversely affected during the ,''* transition to a climate friendly economy . VII. Conclusion p In conclusion, the Kyoto Protocol and the President's general approach to climate change reflect the insight of economic analysis. The Kyoto Protocol includes key provisions on international trading and Clean Development projects. The President's approach relies on market incentives first, with a system of tax cuts and R&D investments, and then later with a market based system of tradeable permits to ensure that our objectives are achieved as efficiently as possible. Our overall conclusion is that the economic impact of the Protocol will be modest under the conditions we have identified. The purpose of this testimony has been to explain the reasoning underlying this conclusion, which draws insights from not only the forecasts of individual models, any one of which has its own strengths and limitations, but also a broad variety of additional analyses. I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Protocol and evaluating the net effects of reducing greenhouse gas emissions. It is my hope that economic analysis will continue to play a key role in designing policies in this area. I welcome your questions.===== END ATTACHMENT 1 =====

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 3-MAR-1998 01:10:35.00

SUBJECT: comments on agriculture climate change testimony

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Keith O. Fuglie (CN=Keith O. Fuglie/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Adele C. Morris (CN=Adele C. Morris/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

Oops -- I forgot to cc you.

----- Forwarded by Joseph E. Aldy/CEA/EOP on 03/03/98

01:12 AM -----

Joseph E. Aldy

03/03/98 01:06:51 AM

Record Type: Record

To: Mark A. Weatherly/OMB/EOP

cc:

Subject: comments on agriculture climate change testimony

Mark,

Attached is a WP6.1 file with our comments on the ag testimony. If you have any questions, please feel free to contact me at x51455.

Joe Aldy

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D67]MAIL489640161.026 to ASCII,
The following is a HEX DUMP:

MEMORANDUM

TO: Mark Weatherly

FROM: Joe Aldy

DATE: March 3, 1998

RE: Agriculture Oversight Testimony on Kyoto Climate Treaty

We appreciate the opportunity to review the Department of Agriculture's climate change testimony. In general, we found it to be a good review of the literature on the effects of climate change on agriculture. We have one major comment regarding the Administration's economic analysis, and several other comments.

Administration's Economic Analysis

On page 7, last paragraph, second sentence, we request the following edit to ensure consistency with Dr. Yellen's testimony:

"Based on the illustrative estimates of a tradeable permit price in the range of \$14 to \$23 per ton of carbon equivalent, which excludes the positive effects of electricity deregulation, the likely impacts on U.S. agriculture will be modest."

Other Comments

- 1) p. 2: Change "Interagency" to "Intergovernmental" in first full paragraph.
- 2) p. 3: Change "naturally" to "natural" in last paragraph.
- 3) p. 6: We suggest changing the second sentence of the bullet paragraph to start: "At double the pre-industrial concentration of carbon dioxide..."
- 4) p. 8: We suggest inserting "certain" before "actions" in the second sentence of the second paragraph.
- 5) p. 9: The estimate of future sequestration does not appear to conform to the definition of sinks under the Protocol. Further, 177 MMTC is closer to 12% of the base year commitment under the Protocol. We suggest substituting an estimate for the 2008-2012 period that reflects the Protocol definition.
- 6) pp. 9-11: The discussion of agricultural soil sinks does not appear to be consistent with the Protocol definition of sinks. We suggest that the section be deleted to avoid confusion over the activities that are included in the sinks definition.

7) p. 12: The discussion of the hypothetical commercial biomass program appears to be premised on a set of very optimistic assumptions. Since for example, the assumption that fossil fuel prices rise over the next 25 years is not substantiated by the 1998 Annual Energy Outlook, it may be appropriate to delete this paragraph. Further, it may spur concerns about the effects of biomass energy production displacing agricultural land and raising food prices.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 3-MAR-1998 18:57:53.00

SUBJECT: last version of oral testimony

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Alice H. Williams (CN=Alice H. Williams/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Attached is the final (?) version of the oral testimony. Dan read through the oral and compared it with the written testimony to ensure that every sentence in the oral appears in the written. In the few cases where there were differences, we made some changes. In addition, I made a couple of editorial changes. These are the changes relative to CCJYORAL.5:

- 1) p. 2: inserted "and thereby leading to accelerated warming" at end of sentence about the warming of the Northern tundra.
- 2) p. 3: changed "methods" to "approaches" after "suggests three basic" in next to last sentence in first full paragraph.
- 3) p. 4: inserted "total" before greenhouse gas emissions in first line on page.
- 4) p. 4: added an "s" to "target" at end of first full sentence on page.
- 5) p. 5: changed "the SGM" to "Battelle's Second Generation Model"

If everyone can live with these changes, then I think the running header that indicates this document is still a draft can be deleted. It's time to ROCK AND ROLL!

Joe===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D27]MAIL49981816F.026 to ASCII,
The following is a HEX DUMP:

**ORAL TESTIMONY OF DR. JANET YELLEN
CHAIR, COUNCIL OF ECONOMIC ADVISERS
BEFORE THE HOUSE COMMERCE COMMITTEE
ON THE ECONOMICS OF THE KYOTO PROTOCOL
MARCH 4, 1998**

Thank you, Mr. Chairman. The President has said that we can work to avert the grave dangers of climate change, while at the same time maintaining the strength of our economy. I agree and am pleased to have this opportunity to appear before the Committee to elaborate on the Administration's views on these issues.

The international agreement that was reached in Kyoto this past December is a crucial step forward in addressing global climate change. But it is only one step in a long journey. Since the international effort to reduce greenhouse gas emissions is still in some respects a work-in-progress, it is not yet possible to provide a full authoritative analysis of it. In my testimony today, I will attempt to identify key elements of the agreement and the Administration's policy, such as international emissions permit trading, meaningful developing country participation, the inclusion of land-use activities that absorb carbon ("sinks") and six categories of gases, as well as domestic initiatives, that can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth.

Effects of Climate Change

The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that "the balance of evidence suggests that there is a discernible human influence on global climate." Current concentrations of carbon dioxide, methane, nitrous oxide, and the other

so-called greenhouse gases have reached levels well above those of preindustrial times. As a result of the increased concentration of greenhouse gases, the IPCC estimates that global temperatures will increase by between 2 to 6 degrees Fahrenheit in the next 100 years, with a best guess of about 3.5 degrees Fahrenheit. The IPCC reports that a doubling of carbon dioxide levels would lead to approximately 10,000 additional deaths per year for the current U.S. population from higher summer temperatures, even after netting out the effects of warmer winters and acclimatization. The IPCC also predicts sea level increases of about 20 inches by 2100, with greater increases in subsequent years. Despite the difficulties of deriving quantitative assessments of the damages from climate change, researchers have nonetheless developed monetary estimates of damages that prompt substantial concern, and range in tens of billions of dollars per year for temperature changes projected to occur in the next century. If left uncontrolled, disruption of the Earth's climate may thus pose substantial costs in terms of harm to commerce and the environment alike. These costs--and they are significant--provide the primary motivation for actions to reduce greenhouse gas emissions.

These estimates do not, and cannot, accurately reflect the value of reducing the unknown risk of large-scale and potentially irreversible events with potentially catastrophic consequences, such as warming of the Northern tundra sufficient to release very large amounts of methane from the permafrost and thereby leading to accelerated warming. There is thus a strong argument for the Kyoto Protocol as a form of insurance against a serious environmental threat.

Kyoto Protocol

To address climate change, the United States and approximately 160 other nations

agreed in negotiations held in Kyoto, Japan, last December, to reduce emissions of greenhouse gases. The Kyoto Protocol, which requires the advice and consent of the Senate, would place binding limits on each industrial country's combined emissions of the six principal categories of greenhouse gases. These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries.

In taking action to reduce emissions, economic analysis suggests that two elements are absolutely essential: the effort must be flexible and market-based, to ensure that we reduce emissions in the most efficient way; and the effort must be global, for without global emissions reductions the effort would be ineffective. The nature of the climate change problem--that greenhouse gas emissions have the same effect on the climate regardless of how, where, and, within limits, when they occur--suggests three basic approaches to lower the cost of achieving given levels of environmental protection. We term these “when”, “what”, and “where” flexibility.

As a result of U.S. diplomatic efforts, all three forms of flexibility are broadly reflected in the Kyoto Protocol. The choice of a multi-year budget period, ending later than many countries proposed, with allowance for “banking” of emissions reductions, constitute key elements of “when flexibility.” These provisions mitigate costs by permitting reductions at times when they are less rather than more costly. The inclusion of all six greenhouse gases and certain sink activities that promote removal of carbon from the atmosphere provide substantial “what flexibility”. The U.S. succeeded in having the Kyoto Protocol stipulate that countries with

binding targets are to reduce total greenhouse gas emissions by certain percentages, but does not require specific reductions for specific gases. Moreover, sinks can be used to offset emissions targets. The inclusion of international emissions trading among countries that take on binding targets, coupled with an agreement allowing industrial countries to receive emissions reduction credit for certified investments in “clean development” projects in the developing world, are the critical forms of “where” flexibility incorporated in the Kyoto Protocol. Although details of these provisions need to be finalized in negotiations in Buenos Aires later this year, we believe that these mechanisms can produce substantial reductions in the costs of attaining our environmental objectives.

The problem of climate change is global and so requires a global solution. Around 2030, under a continuation of business as usual, a majority of world emissions are projected to come from developing countries. Without developing country participation we cannot achieve adequate climate protection. In addition, developing country participation would permit relatively low-cost emissions reductions to be internationally recognized as a substitute for more expensive reductions in many industrial countries. The President has made clear that he will not submit the Kyoto Protocol to the Senate without meaningful participation from key developing countries (who are not included in Annex I).

Economic Effects

An economic analysis of climate change faces three broad categories of difficulties. First are the uncertainties that still remain over the terms of the ultimate treaty. Second are the inherent limitations of available models to analyze even short-term costs and benefits. And

finally is the impossibility of putting a single monetary number on the long-term benefits of climate change mitigation.

Mindful of the limitations of any single model as a tool for evaluating the economic impact of the Kyoto Protocol, we have employed a broad array of techniques to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. Ignoring the benefits of mitigating climate change itself, our conclusion is that the net costs of our policies to reduce emissions are likely to be small if those reductions are undertaken in an efficient manner and we are successful in securing meaningful developing country participation as well as effective international trading and clean-development mechanisms in future negotiations. As I explain in my written testimony, this conclusion is not entirely dependent on, but is fully consistent with, formal model results. For example, given the factors, such as trading, delineated above, but excluding the benefits of acting and the impact of electricity restructuring, estimates derived using Battelle's Second Generation Model suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to just \$7 to \$12 billion per year in 2008 to 2012 -- or just 0.1 percent of projected GDP. That small net premium, in effect, purchases a partial insurance policy against a serious environmental threat.

A comprehensive economic evaluation of the Administration's climate change policies must also take into account the potential payoffs from the full package of proposed Administration climate change initiatives. As you know, the President's FY 1999 budget includes a \$6.3 billion package of tax cuts and R&D over the next 5 years; this package makes good sense in terms of energy policy and will jumpstart our efforts. A second responsible step

entails industry-by-industry consultations to prepare emission reduction plans in key industrial sectors. A final component of the President's climate change policy is his support for electricity restructuring in a manner that will offer approximately \$20 billion in cost savings to electricity consumers, while offering modest reductions in greenhouse gas emissions.

I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Protocol and evaluating the effects of reducing greenhouse gas emissions.

I welcome your questions.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 3-MAR-1998 09:37:16.00

SUBJECT: Climate change testimony

TO: Morrismt (Morrismt @ ssonwpob.us-state.gov @ inet [UNKNOWN])

READ:UNKNOWN

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===== ATTACHMENT 1 =====

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ny of the specifics in several crucial areas are not completely resolved in the diplomaticare
na, forcing analysts to make a variety of assumptions about the ultimate form of the internati
onal regime. In my testimony today, I will attempt to identify key elements of the agreement and

the Administration's policy, such as international emission trading, meaningful developing country participation, inclusion of land use activities that absorb carbon (sinks) and six categories of gases, as well as domestic initiatives, that together can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth. I will explain the reasoning underlying our conclusion that, under these conditions, economic impacts are likely to be modest. The Administration is strongly committed to ensuring that these key elements are reflected in our domestic and international climate change policies. We are firmly committed to meaningful developing country participation, the use of sinks to offset emissions requirements, and emission trading both domestically and internationally. And as you know, the President's FY 1999 budget includes a \$6.3 billion package of tax cuts and R&D investment over the next 5 years; this package makes good sense in terms of energy policy and will jumpstart our efforts. A final component of the President's climate change policy is his support for electricity restructuring in a manner that will offer approximately \$20 billion in costs saving to electricity consumers, while reducing greenhouse gas emissions. I. Basic Economic Rationale of the Kyoto Treaty To begin our analysis, it may be worth stepping back and examining the larger question of the basic rationale, from an economist's perspective, for the Kyoto Protocol. T@4

<DL!T\$&)\>+-0d24XT4 The earth's surface appears to be warming from the accumulation of greenhouse gases from myriad sources worldwide. None of these emitters presently pays the cost to others of warming's adverse effects, a classic externality in the language of economists. As a result of these distorted incentives, disruption of the Earth's climate is likely to proceed at an excessive pace and if left uncontrolled may pose substantial costs in terms of harm to commerce and the environment alike. The fundamental economic logic of the Kyoto Protocol is that without such an international agreement, individual nations will not have the proper incentives to address the threats from global climate change. II. Costs of Climate Change 4 In evaluating efforts to mitigate global warming, the first step is to consider the costs of inaction. These costs and they are significant provide the primary motivation for action to reduce greenhouse gas emissions. 4 The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that the balance of evidence suggests that there is a discernible human influence on global climate. Current concentrations of carbon dioxide, methane, nitrous oxide, and the other so-called greenhouse gases have reached levels well above those of preindustrial times. Of these, carbon dioxide (CO₂) is the most important: net cumulative CO₂ emissions resulting from the burning of fossil fuels and deforestation account for about two-thirds of potential warming from changes in greenhouse gas concentration related to human activity. Climatic Impact p 4 If global emissions continue unabated, the atmospheric concentration of CO₂ will likely double relative to its preindustrial level by midway through the next century and continue to rise thereafter. As a result of the increased concentration of CO₂, the IPCC estimates that global temperatures will increase by between 2 to 6 degrees Fahrenheit in the next 100 years, with a best guess of about 3.5 degrees Fahrenheit. While scientists believe that human activities are leading to a gradual warming of the average temperature of the earth, the change in temperature in a given region at a given time may differ substantially from this average. Indeed, models predict warming will be greater in high latitude than in the tropics, and greater over land than ocean. 4 Potential consequences associated with this shift in climate include a rise in sea levels, greater frequency of severe weather events, shifts in agricultural growing conditions from changing weather patterns, threats to human health from increased range and incidence of diseases, changes in availability of fresh water supplies, and damage to ecosystems and biodiversity. Economic and Monetary Damages P

4 The derivation of quantitative or monetary estimates of the damages from such a change in the climate is extremely difficult given the capacity of today's models. Estimates of the economic damages from climate change fall into the following broad areas: agriculture, sea level rise, air conditioning and heating, water supply, human life and health, air pollution,

and other costs (hurricanes, relocation costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss). Although the quantification of these effects is quite demanding, researchers have developed estimates that prompt substantial concern. The IPCC reports that a doubling of carbon dioxide levels would lead to approximately 10,000 estimated additional deaths per year for the current U.S. population from higher summer temperatures, even after netting out the effects of warmer winters and assuming acclimatization. Other researchers have predicted sea level increases of about 20 inches by 2100, with greater increases in subsequent years.⁴ Despite the difficulties, respected researchers have developed estimates of the monetary damages expected from an average world wide temperature increase. For example, William Cline, then of the Institute for International Economics, estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of about 1.1 percent of GDP per year on the U.S. economy. That amount is \$89 billion in today's terms. (Cline's original estimate is quoted in 1990 dollars. The figure given above translates this number into 1997 dollars, by scaling it to current GDP.) William Nordhaus of Yale University has likewise computed estimates of the dollar loss attributable to a doubling of greenhouse gas concentrations. Although he uses methods that differ from Cline's in several respects, Nordhaus estimates that a slightly larger temperature change of 5.4 degrees Fahrenheit would impose losses equal to about 1 percent of GDP. A third independent estimate reported by Nordhaus is close to Cline's. It must be noted, however, that this similarity among aggregated estimates masks the true uncertainty associated with forecasts of the damages from given increases in global warming; the estimates are all fundamentally based on extrapolations from current and past experience, and may not fully incorporate effects that will unfortunately become apparent only with future experience.⁴ One key difficulty in interpreting and monetizing these estimates of damages is uncertainty over the extent that they should be discounted because they occur in the distant future. Since the benefits of stemming future climate change accrue over not only decades but centuries, small changes in the discount rate can produce substantial changes in the results. But the precise discount rate that should be used to evaluate questions as important as the future climate of the planet remains a subject of intense debate. It is safe to say that there is, as yet, no professional consensus on the issue. Indeed there can be no technical answer to the ethical question how we should value the welfare of future generations.⁴ A similar difficulty with such estimates is that they do not include potential nonlinearities in the relationships between greenhouse gas concentrations and temperature, between temperature and economic damages, or in the various other complicated relationships governing interactions between greenhouse gas emissions, the climate, and the economy. Current estimates of damages do not, and cannot, accurately reflect the value of reducing the unknown risk of large scale and potentially irreversible discrete events with potentially catastrophic consequences.⁴ Two such possibilities serve as illustrations. Warming of Northern tundra may release huge amounts of methane from the permafrost, thereby leading to accelerated warming. We do not know at what point, if any, such potentially unstable activity would be triggered. Second, evidence from climate models suggests that some types of climate change may lead to changes in ocean currents, including weakening of the Gulf Stream that warms Western Europe. Scientific evidence suggests that abrupt sea water temperature shifts have occurred over periods as short as decades.⁴ To what extent are we willing to take such chances with our planet? There is a strong argument for the Kyoto Protocol as a form of planet insurance. But what numerical weight should be assigned to these catastrophic risks? In other words, what is the value of the insurance policy? Although it is difficult for an economist, or anyone, to know, reductions in the risk of such catastrophic outcomes must be considered in addition to the costs and benefits that can be reasonably quantified. Since human beings are typically averse to risk, such catastrophic risks are especially important in evaluating whether the benefits of a particular climate control policy justify the costs. One must have at least some sympathy with those who criticize economists on the ground that the effects of climate change are extremely difficult to quantify in a single

monetary number. P(

III. Addressing Global Climate Change in an Efficient Manner
4 The costs of unabated climate change may thus be difficult to quantify, but they are nonetheless real and provide the motivation for reducing greenhouse gas emissions. Intaking action to reduce those emissions, economic analysis suggests that two elements are absolutely essential: "04 The effort must be global, to address the global externality inherent in the nature of @ the problem.

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#4("04 The effort must be flexible and market based, to ensure that we achieve our objectives in the most efficient manner possible.

4(#4(# Need for Global Action p 4 Climate

change is a global problem requiring a global solution. As I mentioned P earlier, no single country has an incentive to reduce emissions sufficiently to protect the global environment against climate change. Each has an economic incentive to free ride on the efforts of others. Even if the United States sharply reduced its emissions unilaterally without an international agreement limiting emissions abroad, greenhouse gas emissions from all other countries would continue to grow, and the risks posed by climate change would not be significantly reduced. It is important to emphasize that emissions of different gases anywhere in the world have very similar effects on global climate. 4 The threat of disruptive climate change has led to coordinated international efforts to reduce the risks of global warming by reducing emissions of greenhouse gases. A landmark international agreement to address global warming was the Framework Convention on Climate Change, signed during the Earth Summit in Rio de Janeiro in 1992. This convention established an objective of limiting greenhouse gas concentrations and called upon industrial countries to return their emissions to 1990 levels by 2000. Since then, it has become clear that the United States and many other participating countries will not meet this voluntary goal; quite the contrary, emission levels have continued to rise not fall among both developed and developing countries. 4 To address the lack of progress among many industrialized countries toward meeting the Rio objective, the United States and approximately 160 other nations agreed in negotiations held in Kyoto, Japan, last December, to reduce emissions of greenhouse gases. The Kyoto Protocol, which requires the advice and consent of the Senate, would place binding limits on each industrial country's combined emissions of these principal categories of greenhouse gases: carbon dioxide (CO₂), nitrous oxide (N₂O), methane, sulfur hexafluoride, perfluorocarbons, and P hydrofluorocarbons. These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries. 4 Under the Kyoto Protocol, each industrial country's baseline is its 1990 emissions of CO₂, methane, and N₂O and its choice of 1990 or 1995 level of the other three categories of " gases. The United States agreed to a target of 7 percent below this baseline by the period between 2008 and 2012. XXXX Given the changes in the definition of the baseline for the three p&!\$ long-lived chemical compounds (HFCs, PFCs and SF₆) from 1990 to 1995 combined with a change in the ways sinks are accounted for in the baseline, the actual reduction required in the U.S. is no more than 2-3% more than the President originally proposed as the U.S. negotiating , '* position. #XXXX<# The targets for the European Union and Japan are 8 percent and 6 percent below 1990 levels, respectively. Australia, New Zealand, Norway, Russia, and Ukraine all have limits somewhat less ambitious when phrased as cuts relative to their 1990 levels. In sum, over the period from 2008 to 2012, the industrial countries are expected to reduce their average emissions of greenhouse gases to about 5 percent below their 1990 levels. XX 0 XX 4 The President has made clear that he will not submit the Kyoto Protocol to the Senate

without meaningful participation from key developing countries (who are not included in Annex I). 4 There are several reasons why meaningful participation from developing countries is essential. First, developing countries are projected to contribute a majority of world emissions around 2030 under a continuation of business as usual. Without the participation of developing economies, efforts by the industrialized countries to limit emissions will therefore not provide adequate protection from climate change. 4 Second, developing country participation is crucial because it would permit relatively low cost emissions reductions to

be internationally recognized as a substitute for more expensive emissions reductions that might otherwise be achieved domestically by U.S. companies and those in other industrialized countries. Since greenhouse gas emissions have the same basic "impact on the climate regardless of where they occur, emission reductions in developing countries have the same environmental benefits as reductions in the U.S. But these reductions are much less costly than reductions in the U.S. or in other developed nations, because of the very inefficient and carbon intensive uses of energy in these countries today. It thus makes sense, from both an environmental and an economic perspective, to incorporate emissions reductions in "developing countries into the international system. 4 Third, principles of basic fairness suggest all countries should do their part, depending, in part, on their ability to contribute to the solution. Thus even poor countries should participate, although the lack of resources in such countries may limit the extent of their participation. 4 Some have expressed fear that the Kyoto Protocol might adversely affect the competitive position of American industry. Evaluating how the Kyoto Protocol could affect competitiveness of a few specific manufacturing industries especially those that are especially energy intensive, such as aluminum and chemical, is complex. The answer depends, in part, on the impact of the agreement on energy prices, which we will shortly address. In general it is difficult to undergo a structural change in the economy without having the effect of expanding some sectors and contracting others. But to provide some perspective on this issue, consider the following facts. First, on average, energy constitutes only 2.2 percent of total costs to U.S. industry. Second, energy prices already vary significantly across countries. According to the 1997 Statistical Abstract, for example, in 1996 premium gasoline cost \$1.28 per gallon in the @ United States but only 8 cents per gallon in Venezuela. Similarly, gas prices were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. Electricity prices also vary significantly: in the U.S. they were 5 cents per kilowatt hour in 1995, a fraction of prices in Switzerland of 13 cents per kilowatt hour. Yet U.S. industry is not moving en masse to Venezuela, nor is Swiss industry moving to the United States. Third, roughly two thirds of all emissions are not in manufacturing at all, but in transportation and buildings, sectors which, by their very nature, are severely limited in their ability to relocate to other countries. We therefore believe we need "developing country participation because the problem is global and cost effective solutions are essential, than to avoid adverse effects on competitiveness. XXXXXXXX Flexibility and Market Mechanisms p 4A

Global solution is thus critical to the global problem of climate change. Globalizing the solution is not, however, enough by itself. We must also ensure that our efforts to reduce global greenhouse gas emissions reductions in the most efficient manner possible. The nature of the climate change problems suggests three basic methods to lower costs of achieving given levels of environmental protection. They can be characterized in terms of three categories of flexibility: (1) when flexibility; (2) what flexibility; and (3) where flexibility, which may be the most important to fall. Such methods have long been championed by economists interested in increasing the efficiency of protection. Indeed, over 2,500 economists from academia, industry, and government alike urged such approaches in a letter they signed last year advocating action on climate change: 04 Economic studies have found that there are many potential policies to reduce greenhouse gas emissions for which the total benefits outweigh the total costs... The most efficient approach to slowing climate change is through market based policies.

4 (#4 (# 1. When flexibility (timing) 4 First is when flexibility or timing. Since climate change is a long-term problem, the exact timing of emissions reductions is, within some range, not of primary importance. Thus the freedom to delay or accelerate reductions within an agreed upon time frame while ensuring credibility of emissions reductions lowers costs. 4 As a result of U.S. leadership, the Kyoto Protocol incorporates this principle of when "flexibility in four ways: "04 First, the initial emissions reductions are less severe, and the period over which they occur ends much later than what had been proposed by many other countries. By adopting a gradual and credible path of reductions in the early years, we can greatly P reduce costs such as those from prematurely scrapping coal fired electricity plants, while

attaining the same ultimate environmental goals.

4(#4(# "04Second, under the Kyoto Protocol,

the emission target is not specified in terms of a @ specific year, but rather in terms of an average over a five-year period (2008-2012). Averaging over five years, instead of requiring countries to meet a specific target each year, can lower costs, especially given uncertainty about the future. The averaging can smooth out the effects of short-term events such as fluctuations in the business cycle and energy demand, or hard winters and hot summers that would increase energy use and emissions.

4(#4(# "04Third, there is an allowance for banking emission reductions

within the 2008-2012 commitment period, for use in a subsequent commitment period [although the emission targets of the subsequent period have not yet been specified].

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(# "04Fourth, CDM credits achieved between 2000 and 2008 may be banked until 2008 to " 2012.

4(#4(# 2. What flexibility (gases and sinks) 4 These second type of flexibility is what flexibility, along two dimensions. XXXX The first is P(#& the inclusion in the agreement

of all six greenhouse gases. Emissions of different kinds of gases, not just carbon dioxide, contribute to the greenhouse effect. Since the IPCC has developed, " * conversion factors for all greenhouse gases by estimating their global warming potentials, reductions in emissions of one gas can be used to substitute for increases in emissions of another by an amount that has equivalent environmental effects. Against U.S. urging, all six gases are included, while Japan and the EU had insisted until the end on covering only three. Thus the U.S. succeeded in having the Kyoto Protocol stipulate that countries with binding targets are to reduce their total greenhouse gas emissions by certain percentages, but does not require specific

reductions for specific gases. Since a molecule of sulfur hexafluoride is 23,900 times more potent over 100 years than a molecule of CO₂, it may be cheap to achieve the same environmental benefit by eliminating one molecular unit of SF₆ than nearly 24,000 units of CO₂.

4 S Some initial analysis indicates that a strategy of reducing non-CO₂ greenhouse gas emissions by a greater percent than CO₂ emissions could lower and reduce prices by as much as 10 percent. Thus allowing countries flexibility in what gases they reduce essentially trading emissions reductions across gases can help lower significantly the costs of meeting their targets.

4 These second source of what flexibility is the treatment of sinks, i.e., land use activities that promote the removal of carbon from the atmosphere through the growth of plants. At the urging of the U.S. delegation, sinks can be used to offset emission targets. Promoting such sinks through afforestation and reforestation may reduce atmospheric concentrations of CO₂ at much lower costs than reducing emissions of greenhouse gases. XXX X3. Where flexibility (international) p&!\$ 4 The third type of flexibility, and perhaps the most important, is where flexibility (international). As I have already emphasized, emissions have the same environmental consequences regardless of where in the world they occur. Therefore, the least-cost approach to " * controlling climate change is to reduce emissions wherever such reductions are cheapest. The Kyoto Protocol, because of U.S. insistence and persistence, includes three important cost-saving provisions of this nature. "04 First, it provides the opportunity for countries that take on binding targets to trade

P rights to emit greenhouse gases with each other. This market in emissions permits could ensure that emission reductions occur where they are least expensive within the industrial countries. In particular, U.S. companies could purchase emission reductions in other participating countries when doing so would reduce their costs thus lowering costs without affecting the level of environmental protection. While currently only industrialized countries have emissions caps, this mechanism also offers an incentive for developing countries to take on emission targets.

4(#4(# "04Second, the agreement provides for Joint Implementation by

Annex I countries. Thus P if some countries do not develop programs to trade permits internationally, U.S. firms could nonetheless implement projects in those countries for which the

you could receive emissions reductions credits in the U.S.

4.4 Third, the agreement

allows industrial countries to invest in clean development projects in the developing world and use these projects' certified emissions reductions toward meeting their targets. Many such clean development projects may be quite cheap in terms of the cost per ton of emission saved, as has been illustrated by the Joint Implementation pilot program that is already in place in the U.S.

4.4 Detail of how these provisions will operate will be discussed

in future negotiations such as the one in Buenos Aires later this year. Nonetheless, effective international trading of emission credits, Joint Implementation, and the Clean Development Mechanism can lead to substantial reductions in costs relative to alternative policies that do not exploit the power of market incentives. To illustrate briefly the ability of U.S. industry to perform beyond expectations when given appropriate economic incentives, consider further EPA's highly acclaimed sulfur dioxide (SO₂) program, which relies, among other things, on a system of tradable permits to reduce emissions of SO₂ from electric utilities. The SO₂ program has been

successful in several ways: a large number of utilities participate, SO₂ emissions and ambient concentrations have fallen and the costs of reducing emissions are considerably lower than originally forecast. As has been frequently noted, the average cost of SO₂ emissions reductions has recently been significantly lower than was originally forecast, in part due to the role of incentives in fostering innovation. Emission permit prices, currently at approximately \$100 per ton of SO₂, are well below earlier estimates of around \$250 to \$400 per ton. Trading programs may not always bring cost savings as large as those achieved by the SO₂ program; trading programs will not always be accompanied by the discovery of much cheaper control strategies. However, the SO₂ experience demonstrates clearly how programs like international permit trading, Joint Implementation, and the Clean Development Mechanism will lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs. XXXX \$/ton. Difficulties of Economic Analysis of the Kyoto Protocol

4.4 Now that we have a Protocol even if it is not yet fully complete nor ready for the President's submission to the Senate it is possible to examine it in somewhat more detail from an economic perspective. But, once again the inherent limitations of any such estimates deserve emphasis. Such limitations should not be surprising to you: economists have a difficult enough time projecting the behavior of the economy over the next quarter or year, let alone over the next two decades. The scale of the forecasting exercise is therefore daunting, and any specific results should be treated with substantial caution. The difficulties associated with the economic analysis of climate change fall into three broad categories. First are the uncertainties that still remain over the terms of the ultimate treaty, necessitating assumptions on which the analysis is predicated. Second are the inherent limitations of available models to analyze even short-term costs and benefits. And finally is a topic discussed earlier: the impossibility of putting a single monetary number on the long-term benefits of climate change mitigation, although there will clearly be economic benefits of emission reductions. Uncertainties in the International Effort to Combat Climate Change 4 The Kyoto Protocol was a historic accomplishment, delineating the broad terms of the international effort to address climate change. But although we know a lot more than we did before Kyoto about how that international system can work, and that informs our analysis, there is still much that we do not know. 4 First, some provisions raise complex implementation issues. At issue here is the treatment of so-called sinks activities that affect the rate at which carbon is removed from the atmosphere and sequestered, e.g., by the planting of trees. 4 Second, the details of a number of items primarily concerning international trading, the Clean Development Mechanism, and developing countries are the subject of further discussions including future negotiations in Buenos Aires next fall, because they had not been definitively settled by the end of the Kyoto talks. 4 Finally, and most importantly, we have not yet negotiated an international agreement to limit emissions beyond the 2012 window. The emission cuts agreed upon at Kyoto are only a first step on a long journey. The first step that we propose to take over the next 15 years is cri

tical. But the reason it is critical is not that, by itself, it will solve the climate change problem

emissions during any given decade are small compared to the cumulative concentrations in the atmosphere. Rather, the first step is critical because we cannot take these second and third steps until we have taken the first. At the same time, any analysis is complicated by the lack of knowledge over what the subsequent steps will be. Inherent Limitations of Models p 4 In addition to these uncertainties about the details of the international effort to address climate change, are the inherent limitations of the models used to evaluate that effort. Even within a given model, answers depend critically on the precise nature of the question asked. For example, the costs of emissions reductions depend critically on the extent of global participation and international trading that a treaty is assumed to feature. But in addition to the dependence of the results from a given model on the precise assumptions, different models can give different answers even when all the assumptions are specified to be the same. A concrete illustration of the range of uncertainty to which we must assign the predictions of any one individual model. 4 One area in which the uncertainty is particularly large is the pace of technological progress, especially the diffusion of existing energy-efficient technologies, but also the development of new technologies and the extent to which the pace will accelerate in response to government programs. Models and expert opinion on climate change policy tend to have a wide range of disagreement on the scope for speeding the diffusion of existing energy-efficient technologies than on any other single issue. 4 Furthermore, each model has strengths and weaknesses; each has questions to which it is better or worse suited to answer. Some, for example, model the energy sector in detail. Some allow for the fact that a coal-fired power plant cannot cost less simply be converted to one that runs on natural gas. Some show the effects of hypothetical tax cuts made possible by the new revenues earned through the auction of emissions permits. Some are capable of showing recessions and booms. Others include a long-term carbon cycle model that can keep track of the accumulation of greenhouse gas concentrations in the atmosphere and the resulting climate effects. Some break down the rest of the world into regions and so can model international trade. No one model does everything, and therefore we must not rely blindly on the results of any one model or set of models. Professional judgement and economic intuition, along with diplomatic assessments, are also crucial. Benefits of Averting Climate Change @ 4 As discussed above, it is evident that the benefits of averting climate change are potentially immense. But we have chosen not to try to quantify them in monetary terms, in light of the difficulties we have enumerated. These include the uncertainty of these benefits, their timing and therefore the extreme sensitivity of the results to the chosen discount rate, and the dependence of benefits on emissions paths after the 2008 to 2012 budget periods specified in Kyoto.

,'* V. Assessing the Kyoto Protocol 4 In order to evaluate the likely net economic impact of the Kyoto Protocol, excluding the benefits of mitigating climate change itself, we have drawn upon a variety of tools to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. To give away the punchline, our conclusion is as follows: the net costs of four policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and we are successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism in future negotiations. That potential small net premium, even excluding the benefit of mitigating climate change, in effect, purchases a partial insurance policy against a serious environmental threat. 4 Because the results from many models must be treated with caution, the Administration has employed a broad set of economic tools to assess the Kyoto Protocol. We have drawn on the insights of a wider range of models of the energy sector and the economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, the work of the OECD on Economic Dimensions and Policy Responses to Global Warming, and the staff level Interagency Analytical Team analysis produced last year. Other tools include simple relevant statistics, meta-analyses such as work by the World Resources Institute, models, and basic economic reasoning. Drawing on this broad array of analytical tools is crucial to an intelligent evaluation of the policy alternatives. 4 To our knowledge

ge, no model whether used inside the government or not has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old and remains unfinished. In particular, no model is currently designed to assess Kyoto's treatment of sinks, or all six greenhouse gases. Some model builders outside the government tend to take as long as several years to incorporate changes in policy parameters into their models.⁴ Our thinking has been informed, however, by simulations conducted with the Second Generation Model of Battelle Laboratories, one of the leading models in the field. The SGM is one of the models best positioned to analyze the role of international trade in emission permits, which we consider to be a critical element of the Kyoto Treaty. However, the SGM does not cover all six gases included in the Kyoto Protocol or include a role for sinks. We have used the SGM model as one input into our overall assessment of the Kyoto treaty, but have attempted to supplement its results with additional analysis to account for such special features of the agreement as the inclusion of six gases, a possible trading arrangement that could include as a subset of the Annex I countries and the Clean Development Mechanism. We will share with you today some preliminary results of this analysis. To the extent possible, we have compared results obtained with the SGM model with those of other modeling efforts.⁴ Mindful of the limitations of any single model, we are eager to see features of the Kyoto Protocol assessed by other models to obtain a better feel for the range of possible effects. This work is just beginning and much of it will continue to go on outside the government. For example, the Energy Modeling Forum, based at Stanford University, is already running a model

comparison exercise involving many of the leading climate models. EMF is currently studying how features of the Kyoto legal language can be

translated into terms recognizable to economic modelers. We expect that the group will conduct a full scale analysis of the Kyoto Protocol. The Energy Modeling Forum believes that its members will need at least until mid-year to update their results. VI. Assessing the Potential Costs of Emissions Reductions I said in Congressional testimony last July that we can do this smart or we can do this dumb. I was referring to the point that the costs of cutting emissions can be much reduced if flexible, market-based mechanisms are used. Our economic analysis highlighted the importance of such flexible, market-based mechanisms which are therefore reflected, at the President's insistence, in the Kyoto Protocol and our ongoing diplomatic strategy.⁴ Within the Kyoto Protocol, this means an insistence on international trading, Joint Implementation, the Clean Development Mechanism, and, ultimately, on meaningful development in all country participation. Domestically, this means that we implement any emissions reduction through a market-based system of tradeable emissions permits, which ensures that we achieve reductions wherever they are least expensive. But this also means taking serious and responsible steps in the short run to prepare us to meet our obligations in the longer term.⁴ The first such step is the inclusion in this year's budget of an aggressive, \$6.3 billion program of tax cuts and R&D investments \$1.3 billion more than the \$5 billion package the President promised in his October 22 speech on this issue. The goal is both to stimulate the development of new energy saving and carbon saving technologies and to encourage the dissemination of those that exist already. The proposed package contains \$3.6 billion over the next 5 years in tax cuts for energy efficient purchases and renewable energy, including tax credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles, a 15 percent credit (up to \$2,000) for purchases of rooftop solar equipment, a 20 percent credit (subject to a cap) for purchasing energy efficient building equipment, a credit up to \$2,000 for purchasing energy efficient new homes, an extension of the wind and biomass tax credit, and a 10 percent investment credit for the purchase of combined heat and power systems. The package also contains \$2.7 billion over the next 5 years in additional research and development investments covering the four major carbon-emitting sectors of the economy (buildings, industry, transportation, and electricity), plus carbon removal and sequestration, Federal facilities, and cross-cutting analyses and research. One example of the R&D effort is the Partnership for a New Generation of Vehicles (PNGV). PNGV is a government industry effort to develop attractive, affordable

dable cars that meet all applicable safety and environmental standards and get up to three times the fuel efficiency of today's cars. In FY99, the combined proposal for PNGV is \$277 million, up from \$227 million appropriated in FY98. Similar government industry efforts are proposed to develop more efficient diesel engines for both light trucks and heavy trucks.⁴ A second responsible step entails industry by industry consultation to prepare emission reduction plans in key industrial sectors. The Administration will work in partnership with industry to identify ways in which the Federal government might remove regulatory hurdles that discourage energy efficiency. In addition, DOE will spearhead a comprehensive effort to improve the energy efficiency of the Federal government's own operations and purchases.⁴ XXX X The third step is the promotion of an environmentally responsible electricity 0*%(restructuring bill, which the President identified as part of his domestic climate change package ,''* in his address to the National Geographic Society on October 22. An electricity sector freed from government regulation would be a more efficient energy sector. Costs to consumers would fall. In addition, stronger incentives for improved generation efficiency in conjunction with appropriate market based provisions could achieve modest reductions in emissions. A reasonable overall estimate of the contribution of federal electricity restructuring to the rest of the President's program to address climate change is that it would make further progress toward the same emission reduction goals at a cost saving of roughly \$20 billion per year. These steps should be taken regardless of Kyoto, because they make sense in terms of energy efficiency. But they have the added benefit of preparing us for Kyoto. Estimated Reduction in Costs from Annex I Trading 4 In the language of the treaty, Annex I, is the set of countries that have agreed to 0 p take on binding limitations in emissions of greenhouse gases. Even without meaningful developing country participation which, again, the President has emphasized is essential before the treaty would be submitted for ratification costs could be reduced substantially by emission trading among the Annex I countries. To provide some indication of the possible efficiency improvements, Russia and Ukraine consume six times as much energy per dollar of output as does the United States. Such large international differences in energy efficiency suggest that adoption of existing U.S. technology would yield very large emissions reductions in the two countries.⁴ Estimates derived from the SGM model confirm that emission trading among Annex I countries can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half relative to a situation in which such trading was not available. This ,''* concept of costs is meant to capture aggregate resource costs to the U.S. economy, including the cost to domestic firms of purchasing emission permits from other countries where emission reductions may be cheaper than in the United States. Although these estimates reflect idealized international trading in efficient markets, the overall conclusion is clear. The dramatic reduction P incosts potentially available from Annex I trading within the SGM model cutting the costs involved by half highlights why the President insisted that international trading be part of the Kyoto Protocol; and why its achievement by our negotiators in Kyoto was such an important @ accomplishment. Estimated reduction in costs from umbrella trading 4 One possibility that emerged in Kyoto, which none of us foresaw, was the idea developed thereby by the U.S. delegation, that the United States might undertake trading with a subset of Annex I countries, dubbed the umbrella. Countries that have expressed interest in the umbrella include the United States, Australia, Canada, New Zealand and Russia, with strong indications of interest from some others. This subset of Annex I countries shares a common interest in promoting market based mechanisms, most specifically, fully flexible rules for international trading of emission permits.⁴ It is too early to state the precise form the umbrella will take. But we can envision a number of potential benefits. The umbrella could, for example, greatly reduce cost to the U.S. Results that we have derived from various SGM simulations of efficient international trading p&!\$ suggest that, relative to the situation in which there is no trading at all, the umbrella can reduce costs by an estimated 60-75 percent, depending on whether the former Warsaw Pact countries 0*%(fall within the umbrella. The Kyoto Protocol classifies these countries outside of the EU bubble ,''* for the first budget period 2008-2012. Estimated reduction in costs from developing country participation 4 The next consideration is participati

only by developing countries. The President has said that he will not submit the treaty for ratification without meaningful participation by key developing countries. Such participation would further reduce the costs involved. The substantial potential gains from meaningful developing country participation are highlighted by the significant benefits that will likely accrue from the limited role that the developing countries have already agreed to: the Clean Development Mechanism (CDM), modeled after the U.S. joint implementation concept. The CDM cannot realistically be expected to yield all the gains of binding targets for developing countries, but it might have costs by roughly another 20 to 25 percent from the reduced cost that result from trading among Annex I countries. Another possibility is that we persuade some of the key developing countries that are the largest emitters to commit to targets, and allow us to buy emission reductions from those paths. Simulations with the SGM models suggest that full participation by non-Annex I countries could cut roughly 55 percent off the reduced costs that result from Annex I trading. The actual cost reduction would depend on the extent of developing country participation that is ultimately obtained, as well as the effectiveness of international trading arrangements. The more developing countries that take on more binding targets and trade in international permit markets, the lower will be costs. The cost savings opportunities are fundamental tenets of the U.S. position. The promise of Kyoto cannot be achieved without effective emission trading. Moreover, if we do not get meaningful participation by key developing countries, we won't submit the treaty for ratification to the Senate. So, while our analysis may be predicated on some ambitious conditions concerning trading and developing country participation, it is exactly those conditions that form the foundation of the U.S. position in international negotiations including those at Buenos Aires.

Accounting for Carbon Sinks

The preceding discussion has emphasized the importance of trading arrangements and the CDM. In reaching an overall economic assessment, it is also important to factor in the potential role of carbon sinks. Again, the U.S. delegation obtained a novel concept, that carbon absorbing activities called sinks could be used to offset emissions. The arrangements concerning carbon sinks in the Kyoto Protocol have received less attention than they merit. The Kyoto Protocol specifies that removal of CO₂ by sinks count toward meeting the target. The Kyoto Protocol counts the net emission effect of three sink activities: afforestation, reforestation, and deforestation. Very preliminary estimates of the implications for the United States of the Kyoto provisions indicate that carbon sinks could comprise a significant portion of the total required emissions reductions. Moreover, decreasing the required emissions reduction by, for example, 10% would likely result in cost savings greater than 10%.

Even this estimate of the effect of sinks is conservative in one respect: it is based on an assumption for sink activity in the U.S. over the 2008-2012 period, and no assumed benefits from sinks elsewhere in the world. Very preliminary estimates suggest that incorporating the gains from sinks throughout the world can substantially reduce the costs of meeting the Kyoto target, on top of the gains from trading among Annex I countries. (Furthermore, no model has yet even tried to take into account that government policies can help increase the activities qualifying as allowable sinks, like some tree planting.) Because the quantitative uncertainty is so large, we do not yet have an estimate with which we are comfortable. But we expect that complete modeling of the Kyoto provision pertaining to sinks will likely have favorable and potentially large effects on projected costs. Accounting for the role of improvements in energy efficiency

Another issue in analyzing the Kyoto protocol concerns future improvements in energy efficiency due to innovation and diffusion of existing technology. The parameter that figures most prominently in analysis of energy efficiency is the rate of improvement in the so-called Autonomous Energy Efficiency Index (AEEI), that is the rate at which the total use of energy falls relative to GDP. A plausible assumption on the AEEI is an improvement of 1.0 percent per year. Reflecting a conservative interpretation of the 15-year impact of various climate change initiatives, this is only a small increase above the 0.9 percent number in the Energy Information Administration's Annual Energy Outlook. That assumption is not the most optimistic

outcome that might occur. Some authorities in the field of energy policy forecast more rapid technological progress. Experts at five national laboratories managed by the Department of Energy, using an engineering approach rather than an economic paradigm, found that a third of the emissions reductions necessary to return to 1990 levels by 2010 could be achieved through the adoption of existing energy efficient technologies at net resource cost, or even some savings. The National Academy of Sciences reached qualitatively similar conclusions in a 1992 report.⁴ The President's FY 1999 budget, as I have noted, includes a \$6.3 billion package of tax cuts and R&D investments intended to spur the discovery and adoption of new technologies. If the Administration is successful in this effort, the rate of improvement in energy efficiency could rise and such improvements would lower the cost of meeting our Kyoto target. For example, published results based on SGM model simulations with different assumed rates of AEE suggest that an increase in the AEE of 25 percent could lead to declines in the permit price of approximately 40 percent.⁴ Our justification for incorporating into our assessment a small assumed impact of Administration technology policies is somewhat analogous to the Administration's rationale for employing mainstream economic assumptions in our budget forecasts: in the presence of uncertainty, we are conservative in our estimates of the speed with which the economy will grow, tax receipts will rise, and the budget will improve. That way, any revisions or surprises that occur are likely to be in the pleasant direction. In this instance, we prudently and conservatively assume that there will be substantial delays between investments in new technology or the diffusion of existing technology, and the return to such investments.⁴ Moreover, at the recent automobile show in Detroit, General Motors announced that it has developed a hybrid based vehicle that can achieve fuel efficiency of 80 miles per gallon, and that this car could be in commercial production within a few years. Ford also exhibited a prototype of a lightweight highly fuel efficient sedan that could be in commercial production by the middle of the next decade. These announcements followed an earlier breakthrough announced by DOE and its partners of a fuel cell that could run on gasoline and double current fuel economy while reducing conventional air pollution emissions by 90 percent. These technological advances have been made possible through the efforts of the Partnership for a New Generation of Vehicles between the Administration and the U.S. auto companies and their suppliers.⁴ Such progress may be replicated in other sectors. VCRs and TVs, while switched off, consume about \$1 billion worth of electricity annually. EPA has established a partnership with major manufacturers that has a goal of achieving up to a 70 percent reduction in energy use by VCRs and TVs while they are switched off, without sacrificing product quality, usefulness, or increasing costs. This partnership offers promise of substantial improvements in energy efficiency. Non-Climate Benefits ⁴A final factor that should be included in any comprehensive assessment of the economic implications of the Kyoto protocol are the benefits of the agreement. The literature has emphasized that any relative price shifts that prove necessary to reduce emissions should produce non-climate benefits in three areas: traffic congestion, highway accidents, and air pollution unrelated to climate change. These benefits are hard to quantify precisely but are potentially significant: our rough estimates suggest that these three benefits could offset approximately a quarter of the resource cost of the climate change policy. Synthesis ⁴A comprehensive evaluation of the economic impact of the Kyoto Protocol must integrate all of the factors described above: reliance on flexible market based mechanisms domestically; international trading and Joint Implementation among Annex I countries; the Clean Development Mechanism; meaningful developing country participation; the potential cost mitigating role of including six gases and carbon sinks; the benefits of electricity restructuring; and emissions reductions achieved as a consequence of other proposed Administration climate change initiatives. Assuming that effective mechanisms for international trading, Joint Implementation and the Clean Development Mechanism are established, and assuming also that the U.S. achieves meaningful developing country participation, our overall assessment is that the economic cost to the United States in aggregate and to typical households of attaining the targets and timetable specified in the Kyoto Protocol, will be modest. This conclusion that the impact will be modest is not entirely dependent upon, but is fully consistent with, formal model results. I have previously emphasized the limita-

tionsofrelyingonany single model in assessing the economic impact of the Kyoto Protocol, and continue to view any such results as just one input into an overall analysis. But it is worth emphasizing that model results reflecting the details of the Kyoto Protocol are consistent with our conclusion. For example, under the assumption of either trading under the umbrella or within Annex I, the CDM and permitting trading with developing countries, estimates derived using the SGM model, which had just for the inclusion of six gases and assumed little banking of credits beyond 2012, suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to \$7 to \$12 billion per year in 2008 to 2012. This implies that overall costs, excluding not only climate and nonclimate benefits, but also such cost mitigating factors as sinks and payoffs from the President's electricity restructuring and climate change initiatives, would reach roughly one tenth of one percent of projected GDP in 2010. A more tangible measure of costs is the estimated effect on energy prices. Excluding the impact of electricity restructuring and the ancillary benefits of mitigation and better forest management, the SGM based estimate, corresponding to the gross resource cost estimate cited above, is an emissions price in the range of \$14 to \$23 per ton of carbon equivalent. This translates in to an increase in energy prices between 2008 and 2012 at the household level of between 3 and 5 percent, an increase in fuel oil prices of about 5 to 9 percent, natural gas prices of 3 to 5 percent, gasoline prices of 3 to 4 percent (or around 4 to 6 cents per gallon), and electricity prices of 3 to 4 percent. This increase in energy prices at the household level would raise the average household's energy bill in ten years by between \$70 and \$110 per year, although such predictions may not be observable because they would be small relative to typical energy price changes, and nearly fully offset by electricity price declines from Federal electricity restructuring. In particular, this increase in energy prices is small relative to the average of year to year real energy price changes experienced by U.S. consumers since 1960: such annual changes have averaged 3.8 percent. In addition, by 2008 to 2012, the anticipated 10 percent decline in electricity prices from the restructuring that is part of four climate change agenda is projected to lead to expenditure reductions of about \$90 per year for the average household.

As highlighted earlier, there are substantial but unavoidable uncertainties surrounding estimates like these. For example, the estimate just discussed is predicated, among other things, on the developing country participation that we are insisting upon as a condition for our ratifying the Kyoto Protocol, but which is not yet part of that Protocol, and on effective international trading. Moreover, other models will yield other answers and much work remains to be done by the modeling community to test the robustness of these results. Preliminary comparisons of the SGM model to the few other models that have attempted to evaluate the Kyoto accord, suggest that its predictions concerning the impact of the Kyoto Protocol on carbon permit prices are neither the most conservative nor the most optimistic of the models that have been developed. The predictions of the SGM model are robust in the sense that virtually all energy models reveal the potency of effective, flexible, domestic and international trading mechanisms to reduce substantially the cost and energy price impact of meeting the Kyoto targets. Of course, the most important factor that has been left out of the above assessment is the benefit of mitigating climate change itself. A full cost benefit analysis would include mitigation in the benefits column. The only reason we have not done so, explained repeatedly above, is the difficulty in coming up with a number to capture the monetary benefits. But nobody should lose sight of our ultimate objective: keeping our planet the hospitable home that we enjoy today. Effects on employment and aggregate output. So far we have said nothing about job losses resulting from climate change policy. Although there may be job gains in some sectors and job losses in others, we do not anticipate any significant aggregate employment effect if we achieve the conditions we have discussed. The effects on energy prices described above will occur only 10 to 14 years in the future. Not only are these effects small relative to historical variations in energy prices, and offset by other policies like electricity restructuring, they would occur sufficiently far in the future to enable monetary policy to keep the economy operating at its potential. In energy intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most such sectors are

cap to be minimal. Furthermore, a large number of jobs will be created in other sectors many of them high tech jobs paying high wages. The President is firmly committed to assisting any workers who are adversely affected during the transition to a climate friendly economy. , '* V

II. Conclusion In conclusion, the Kyoto Protocol and the President's general approach to climate change reflect the insight of economic analysis. The Kyoto Protocol includes key provisions on international trading and Clean Development projects. The President's approach relies on market incentives first, with a system of tax cuts and R&D investments, and then later with a market based system of tradeable permits to ensure that our objectives are achieved as efficiently as possible. Our overall conclusion is that the economic impact of the Protocol will be modest under the conditions we have identified. The purpose of this testimony has been to explain the reasoning underlying this conclusion, which draws insights from not only the forecasts of individual models, any one of which has its own strengths and limitations, but also a broad variety of additional analyses. I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Protocol and evaluating the net effects of reducing greenhouse gas emissions. It is my hope that economic analysis will continue to play a key role in designing policies in this area. I welcome your questions. ===== END ATTACHMENT 1 =====

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you, Mr. Chairman. The President has said that we can work to avert the grave dangers of climate change, while at the same time maintaining the strength of our economy. I agree and am pleased to have this opportunity to appear before the Committee to elaborate on the Administration's views on these issues. The international agreement that was reached in Kyoto this past December is a crucial step forward in addressing global climate change. But it is only one step in a journey. Since the international effort to reduce greenhouse gas emissions is still in some respects a work in progress, it is not yet possible to provide a full authoritative analysis of it. Many of the specifics in several crucial areas are not completely resolved in the diplomatic arena, forcing analysts to make a variety of assumptions about the ultimate form of the international regime. In my testimony today, I will attempt to identify key elements of the agreement and the Administration's policy, such as international emission trading, meaningful developing country participation, inclusion of land use activities that absorb carbon (sinks) and six categories of gases, as well as domestic initiatives, that together can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth. I will explain the reasoning underlying our conclusion that, under these conditions, economic impacts are likely to be modest. The Administration is strongly committed to ensuring that these key elements are

reflected in our domestic and international climate change policies. We are firmly committed to meaningful developing country participation, the use of sinks to offset emissions requirements, and emission trading both domestically and internationally. And as you know, the President's FY 1999 budget includes a \$6.3 billion package of tax cuts and R&D investment over the next 5 years; this package makes good sense in terms of energy policy and will jumpstart our efforts. A final component of the President's climate change policy is his support for electricity restructuring in a manner that will offer approximately \$20 billion in costs saving to electricity consumers, while reducing greenhouse gas emissions. I. Basic Economic Rationale of the Kyoto Treaty To begin our analysis, it may be worth stepping back and examining the larger question of the basic rationale, from an economist's perspective, for the Kyoto Protocol. The earth's surface appears to be warming from the accumulation of greenhouse gases from myriads of sources worldwide. None of these emitters presently pays the cost to others of warming's adverse effects, a classic externality in the language of economists. As a result of these distorted incentives, disruption of the Earth's climate is likely to proceed at an excessive pace and if left uncontrolled may pose substantial costs in terms of harm to commerce and the environment like. The fundamental economic logic of the Kyoto Protocol is that without such an international agreement, individual nations will not have the proper incentives to address the threats from global climate change. II. Costs of Climate Change In evaluating efforts to mitigate global warming, the first step is to consider the costs of inaction. These costs and they are significant provide the primary motivation for actions to reduce greenhouse gas emissions. The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that the balance of evidence suggests that there is a discernible human influence on global climate. Current concentrations of carbon dioxide, methane, nitrous oxide, and the others so-called greenhouse gases have reached levels well above those of preindustrial times. Of these, carbon dioxide (CO₂) is the most important: net cumulative CO₂ emissions resulting from the burning of fossil fuels and deforestation account for about two-thirds of potential warming from changes in greenhouse gas concentrations related to human activity. Climatic Impact If global emissions continue unabated, the atmospheric concentration of CO₂ will likely double relative to its preindustrial level by midway through the next century and continue to rise thereafter. As a result of the increased concentration of CO₂, the IPCC estimates that global temperatures will increase by between 2 to 6 degrees Fahrenheit in the next 100 years, with a best guess of about 3.5 degrees Fahrenheit. While scientists believe that human activities are leading to a gradual warming of the average temperature of the earth, the change in temperature in a given region at a given time may differ substantially from this average. Indeed, models predict warmi

ng will be greater in high latitudes than in the tropics, and greater over land than over ocean. 4 Potential consequences associated with this shift in climate include a rise in sea level, greater frequency of severe weather events, shifts in agricultural growing conditions from changing weather patterns, threats to human health from increased range and incidence of diseases, changes in availability of freshwater supplies, and damage to ecosystems and biodiversity. Economic and Monetary Damages @ 4 The derivation of quantitative or monetary estimates of the damages from such a change in the climate is extremely difficult given the capacity of today's models. Estimates of the economic damages from climate change fall into the following broad areas: agriculture, sea level rise, air conditioning and heating, water supply, human life and health, air pollution, and other costs (hurricanes, relocation costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss). Although the quantification of these effects is quite demanding, researchers have developed estimates that prompt substantial concern. The IPCC reports that a doubling of carbon dioxide levels would lead to approximately 10,000 estimated additional deaths per year for the current U.S. population from higher summer temperatures, even after netting out the effects of warmer winters and assuming acclimatization. Other researchers have predicted sea level increases of about 20 inches by 2100, with greater increases in subsequent years. 4 Despite the difficulties, respected researchers have developed estimates of the monetary damages expected from an average world wide temperature increase. For example, William Cline, then of the Institute for International Economics, estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of about 1.1 percent of GDP per year on the U.S. economy. That amounts to \$89 billion in today's terms. (Cline's original estimate is quoted in 1990 dollars. The figure given above translates this number into 1997 terms by scaling it to current GDP.) William Nordhaus of Yale University has likewise computed estimates of the dollar loss attributable to a doubling of greenhouse gas concentrations. Although he uses methods that differ from Cline's in several respects, Nordhaus estimates that a slightly larger temperature change of 5.4 degrees Fahrenheit would impose losses equal to about 1 percent of GDP. A third independent estimate reported by Nordhaus is close to Cline's. It must be noted, however, that this similarity among aggregated estimates masks the true uncertainty associated with forecasts of the damages from given increases in global warming; the estimates are all fundamentally based on extrapolations from current and past experience, and may not fully incorporate effects that will unfortunately become apparent only with future experience. 4 One key difficulty in interpreting and monetizing these estimates of damages is uncertainty over the extent that they should be discounted because they occur in the distant future. Since the benefits of stemming future climate change accrue over not only decades but centuries, small changes in the discount rate can produce substantial changes in the results. But the precise discount rate that should be used to evaluate questions as important as the future climate of the planet remains a subject of intense debate. It is a fact to say that there is, as yet, no professional consensus on the issue. Indeed there can be no technical answer to the ethical question how we should value the welfare of future generations. 4 A similar difficulty with such estimates is that they do not include potential nonlinearities in the relationships between greenhouse gas concentrations and temperature, between temperature and economic damages, or in the various other complicated relationships governing interactions between greenhouse gas emissions, the climate, and the economy. Current estimates of damages do not, and cannot, accurately reflect the value of reducing the unknown risk of large scale and potentially irreversible discrete events with potentially catastrophic consequences. 4 Two such possibilities serve as illustrations. Warming of the Northern tundra may release huge amounts of methane from the permafrost, thereby leading to accelerated warming. We do not know at what point, if any, such potentially unstable activity would be triggered. Second, evidence from climate models suggests that some types of climate change may lead to changes in ocean currents, including weakening of the Gulf Stream that warms Western Europe. Scientific evidence suggests that abrupt seawater temperature shifts have occurred over periods as short as decades. 4 To what extent are we willing to take such chances with our planet

? There is a strong argument for the Kyoto Protocol as a form of planet insurance. But what numerical weight should one assign to these catastrophic risks? In other words, what is the value of the insurance policy? Although it is difficult for an economist, or anyone, to know, reduction in the risk of such catastrophic outcomes must be considered in addition to the costs and benefits that can be reasonably quantified. Since human beings are typically averse to risk, such catastrophic risks are especially important in evaluating whether the benefits of a particular climate control policy justify the costs. One must have at least some sympathy with those who criticize economists on the grounds that the effects of climate change are extremely difficult to quantify in a single monetary number. III. Addressing Global Climate Change in an Efficient Manner 4 The costs of unabated climate change may thus be difficult to quantify, but they are nonetheless real and provide the motivation for reducing greenhouse gas emissions. In taking action to reduce those emissions, economic analysis suggests that two elements are absolutely essential: "04 The effort must be global, to address the global externality inherent in the nature of (the problem.

4 (#4 (# "04 The effort must be flexible and market based, to ensure that we achieve our objectives in the most efficient manner possible.

4 (#4 (# Need for Global Action 4 Climate change is a global problem requiring a global solution. As I mentioned earlier, no single country has an incentive to reduce emissions sufficiently to protect the global environment against climate change. Each has an economic incentive to free ride on the efforts of others. Even if the United States sharply reduced its emissions unilaterally without an international agreement limiting emissions abroad, greenhouse gas emissions from all other countries would continue to grow, and the risks posed by climate change would not be significantly reduced. It is important to emphasize that emissions of different gases in any place in the world have very similar effects on global climate.

4 The threat of disruptive climate change has led to coordinated international effort to reduce the risks of global warming by reducing emissions of greenhouse gases. A landmark international agreement to address global warming was the Framework Convention on Climate Change signed during the Earth Summit in Rio de Janeiro in 1992. This convention established an objective of limiting greenhouse gas concentrations and called upon industrial countries to return their emissions to 1990 levels by 2000. Since then, it has become clear that the United States and many other participating countries will not meet this voluntary goal; quite the contrary, emission levels have continued to rise not fall among both developed and developing countries. 4 To address the lack of progress among many industrialized countries toward meeting the Rio objective, the United States and approximately 160 other nations agreed in negotiations held in Kyoto, Japan, last December, to reduce emissions of greenhouse gases. The Kyoto Protocol, which requires the advice and consent of the Senate, would place binding limits on each industrial country's combined emissions of the six principal categories of greenhouse gases: carbon dioxide (CO₂), nitrous oxide (N₂O), methane, sulfur hexafluoride, perfluorocarbons, and HFC hydrofluorocarbons. These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries. 4 Under the Kyoto Protocol, each industrial country's baseline is its 1990 emissions of CO₂, methane, and N₂O and its choice of 1990 or 1995 level of the other three categories of H gases. The United States agreed to a target of 7 percent below this baseline by the period between 2008 and 2012. XXXX Given the changes in the definition of the baseline for the three long-lived chemical compounds (HFCs, PFCs and SF₆) from 1990 to 1995 combined with a change in the ways sinks are accounted for in the baseline, the actual reduction required in the U.S. is no more than 2-3% more than the President originally proposed as the U.S. negotiating position. XXXX; # The targets for the European Union and Japan are 8 percent and 6 percent below 1990

levels, respectively. Australia, New Zealand, Norway, Russia, and Ukraine all have limits somewhat less ambitious when phrased as cuts relative to their 1990 levels. In sum, over the period from 2008 to 2012, the industrial countries are expected to reduce their average emissions of greenhouse gases to about 5 percent below their 1990 levels. XX XX 4 Th

ePresident has made clear that he will not submit the Kyoto Protocol to the Senate without meaningful participation from key developing countries (who are not included in Annex I).⁴ There are several reasons why meaningful participation from developing countries is essential. First, developing countries are projected to contribute a majority of world emissions around 2030 under a continuation of business as usual. Without the participation of developing economies, efforts by the industrialized countries to limit emissions will therefore not provide adequate protection from climate change.⁴ Second, developing country participation is crucial because it would permit relatively low-cost emissions reductions to be internationally recognized as a substitute for more expensive emissions reductions that might otherwise be achieved domestically by U.S. companies and those in other industrialized countries. Since greenhouse gas emissions have the same basic impact on the climate regardless of where they occur, emission reductions in developing countries have the same environmental benefits as reductions in the U.S. But these reductions are much less costly than reductions in the U.S. or in other developed nations, because of the very inefficient and carbon-intensive uses of energy in these countries today. It thus makes sense, from both an environmental and an economic perspective, to incorporate emissions reductions in developing countries into the international system.⁴ Third, principles of basic fairness suggest all countries should do their part, depending, in part, on their ability to contribute to the solution. Thus even poor countries should participate, although the lack of resources in such countries may limit the extent of their participation.⁴ Some have expressed fear that the Kyoto Protocol might adversely affect the competitive position of American industry. Evaluating how the Kyoto Protocol could affect competitiveness of a few specific manufacturing industries especially those that are especially energy-intensive, such as aluminum and chemicals is complex. The answer depends, in part, on the impact of the agreement on energy prices, which we will shortly address. In general it is difficult to undergo a structural change in the economy without having the effect of expanding some sectors and contracting others. But to provide some perspective on this issue, consider the following facts. First, on average, energy constitutes only 2.2 percent of total costs to U.S. industry. Second, energy prices already vary significantly across countries. According to the 1997 Statistical Abstract, for example, in 1996 premium gasoline cost \$1.28 per gallon in the United States but only 8 cents per gallon in Venezuela. Similarly, gas prices were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. Electricity prices also vary significantly: in the U.S. they were 5 cents per kilowatt-hour in 1995, a fraction of prices in Switzerland of 13 cents per kilowatt-hour. Yet U.S. industry is not moving en masse to Venezuela, nor is Swiss industry moving to the United States. Third, roughly two-thirds of all emissions are not in manufacturing at all, but in transportation and buildings, sectors which, by their very nature, are severely limited in their ability to relocate to other countries. We therefore believe we need developing country participation because the problem is global and cost-effective solutions are essential, than to avoid adverse effects on competitiveness.

XXXXXXXXXXXXXXXX Flexibility and Market Mechanisms

4 A global solution is thus critical to the global problem of climate change. Globalizing the solution is not, however, enough by itself. We must also ensure that our efforts to reduce global greenhouse gas emissions reductions in the most efficient manner possible. The nature of the climate change problems suggests three basic methods to lower costs of achieving given levels of environmental protection. They can be characterized in terms of three categories of flexibility: (1) when flexibility; (2) what flexibility; and (3) where flexibility, which may be the most important to fall. Such methods have long been championed by economists interested in increasing the efficiency of protection. Indeed, over 2,500 economists from academia, industry, and government alike urged such approaches in a letter they signed last year advocating action on climate change.⁰⁴ Economic studies have found that there are many potential policies to reduce greenhouse gas emissions for which the total benefits outweigh the total costs... The most efficient approach to slowing climate change is through market-based policies.

4 (#4 (#

4 (#4 (# 1. When flexibility (timing) 4 First is wh

enflexibility or timing. Since climate change is a long-term problem, the exact timing of emissions reductions is, within some range, not of primary importance. Thus the freedom to delay or accelerate reductions within an agreed-upon time frame while ensuring credibility of emissions reductions lowers costs.⁴ As a result of U.S. leadership, the Kyoto Protocol incorporates this principle of when flexibility in four ways: "04 First, the initial emissions reductions are less severe, and the period over which they occur ends much later than what had been proposed by many other countries. By adopting a gradual and credible path of reductions in the early years, we can greatly reduce costs such as those from prematurely scrapping coal-fired electricity plants, while attaining the same ultimate environmental goals.

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"04 Second, under the Kyoto Protocol, the emission target is not specified in terms of a specific year, but rather in terms of an average over a five-year period (2008-2012). Averaging over five years, instead of requiring countries to meet a specific target each year, can lower costs, especially given an uncertain future. The averaging can smooth out the effects of short-term events such as fluctuations in the business cycle and energy demand, or hard winters and hot summers that would increase energy use and emissions.

4(#4(# "04 Third, the

ere is allowance for banking emission reductions within the 2008-2012 commitment period, for use in a subsequent commitment period [although the emission target of the subsequent period has not yet been specified].

4(#4(# "04 Fourth, CDM credits

achieved between 2000 and 2008 may be banked until 2008 to 2012.

4(#4(# 2. What flexibility (gases and sinks) 4 The second type of flexibility is

what flexibility, along two dimensions. XXXX The first is the inclusion in the agreement of all six greenhouse gases. Emissions of different kinds of gases, not just carbon dioxide, contribute to the greenhouse effect. Since the IPCC has developed conversion factors for all greenhouse gases by estimating their global warming potentials, reductions in emissions of one gas can be used to substitute for increases in emissions of another by an amount that has equivalent environmental effects. Against U.S. urging, all six gases are included, while Japan and the EU had insisted until then on covering only three. Thus the U.S. succeeded in having the Kyoto Protocol stipulate that countries with binding targets are to reduce their total greenhouse gas emissions by certain percentages, but does not require specific reductions for specific gases. Since a molecule of sulfur hexafluoride is 23,900 times more potent over 100 years than a molecule of CO₂, it may be cheap to achieve the same environmental benefit by eliminating one molecular unit of SF₆ than nearly 24,000 units of CO₂. *#& 4 Some initial analysis indicates that a strategy of reducing non-CO₂ greenhouse gases by a greater percent than reductions of CO₂ emissions could lower prices by as much as 10 percent.

h Thus allowing countries flexibility in what gases they reduce essentially trading emissions reductions across gases can help lower significantly the costs of meeting their targets. 4 The second source of what flexibility is the treatment of sinks, i.e., land use activities that promote the removal of carbon from the atmosphere through the growth of plants. At the urging of the U.S. delegation, sinks can be used to offset emission targets. Promoting such sinks through afforestation and reforestation may reduce atmospheric concentrations of CO₂ @ at much lower cost than reducing emissions of greenhouse gases. XXX X3. What

ere flexibility (international) h 4 The third type of flexibility, and perhaps the most important, is where flexibility (international). As I have already emphasized, emissions have the same environmental consequences regardless of where in the world they occur. Therefore, the least-cost approach to controlling climate change is to reduce emissions wherever such reductions are cheapest. The Kyoto Protocol, because of U.S. insistence and persistence, includes three important cost-saving provisions of this nature. "04 First, it provides the opportunity for countries that take on binding targets to trade " rights to emit greenhouse gases with each other. This market in emissions permits could ensure that emissions reductions occur where they are least expensive within the industrial countries. In particular, U.S.

companies could purchase emissions reductions in other participating countries when doing so would reduce their costs thus lowering costs without affecting the level of environmental protection. While +%(currently only industrialized countries have emissions caps, this mechanism also offers an incentive for developing countries to take on emission targets.

4(#4(# "04 Second, the agreement provides for Joint Implementation by Annex I countries.

Thus (if some countries do not develop programs to trade permits internationally, U.S. firms could nonetheless implement projects in those countries for which they could receive emissions reductions credits in the U.S.

4(#4(# "04 Third, the agreement allows industrial countries to invest in clean development @ projects in the developing world and use these projects' certified emissions reductions toward meeting their targets. Many such clean development projects may be quite cheap in terms of the cost per ton of emissions avoided, as has been illustrated by the Joint Implementation pilot program that is already in place in the U.S.

4(#4(# Detail of how these provisions will operate will be discussed in future negotiations such as the one in Buenos Aires later this year. Nonetheless, effective international trading of emission credits, Joint Implementation, and the Clean Development Mechanism can lead to substantial reductions in costs relative to alternative policies that do not exploit the power of market incentives. To illustrate briefly the ability of U.S. industry to perform beyond expectations when given appropriate economic incentives, consider further EPA's highly acclaimed sulfur dioxide (SO₂) program, which relies, among other things, on a system of "H&" tradeable permits to reduce emissions of SO₂ from electric utilities. The SO₂ program has been ((! \$ successful in several ways: a large number of utilities participate, SO₂ emissions and ambient *#& concentrations have fallen and the costs of reducing emissions are considerably lower than +%(originally forecast. 4 As has been frequently noted, the average cost of SO₂ emissions reductions has H recently been significantly lower than was originally forecast, in part due to the role of incentives in fostering innovation. Emission permit prices, currently at approximately \$100 per ton of SO₂, are well below earlier estimates of around \$250 to \$400 per ton. 4 Trading programs may not always bring cost savings as large as those achieved by the `

SO₂ program; trading programs will not always be accompanied by the discovery of much @ cheaper control strategies. However, the SO₂ experience demonstrates clearly how programs like

international permit trading, Joint Implementation, and the Clean Development Mechanism will lead firms to find cheaper ways of reducing emissions that can lead to unexpectedly low costs. XXXX H #XXXXt#IV. Difficulties of Economic Analysis of the Kyoto Protocol

4 Now that we have a Protocol even if it is not yet fully complete nor ready for the President's submission to the Senate it is possible to examine it in somewhat more detail from an economic perspective. But, once again the inherent limitations of any such estimates deserve emphasis. Such limitations should not be surprising to you: economists have a difficult enough time projecting the behavior of the economy over the next quarter or year, let alone over the next two decades. The scale of the forecasting exercise is therefore daunting, and any specific result should be treated with substantial caution. 4 The difficulties associated with the economic analysis of climate change fall into three broad categories. First are the uncertainties that still remain over the terms of the ultimate treaty, +%(necessitating assumptions on which the analysis is predicated. Second are the inherent limitations of available models to analyze even short-term costs and benefits. And finally is a topic discussed earlier: the impossibility of putting a single monetary number on the long-term benefits of climate change mitigation, although there will clearly be economic benefits of emission reductions. Uncertainties in the International Effort to Combat Climate Change `

4 The Kyoto Protocol was an historic accomplishment, delineating the broad terms of the international effort to address climate change. But although we know a lot more than we did before Kyoto about how that international system can work, and that informs our analysis, there is

till much that we do not know. 4 First, some provisions raise complex implementation issues. A issue here is the treatment of so-called sinks activities that affect the rate at which carbon is removed from the atmosphere and sequestered, e.g., by the planting of trees. 4 Second, the details of a number of items primarily concerning international trading, the Clean Development Mechanism, and developing countries are the subject of further discussions including future negotiations in Buenos Aires next fall, because they had not been definitively settled by the end of the Kyoto talks. 4 Finally, and most importantly, we have not yet negotiated international agreements to limit emissions beyond the 2012 window. The emission cuts agreed upon at Kyoto are only a first step on a long journey. The first step that we propose to take over the next 15 years is critical. But the reason it is critical is not that, by itself, it will solve the climate change problem. +%(emissions during any given decade are small compared to the cumulative concentrations in the atmosphere. Rather, the first step is critical because we cannot take the second and third steps until we have taken the first. At the same time, any analysis is complicated by the lack of knowledge over what the subsequent steps will be. Inherent Limitations of Models

4 In addition to these uncertainties about the details of the international effort to address climate change, are the inherent limitations of the models used to evaluate that effort. Even within a given model, answers depend critically on the precise nature of the question asked. For example, the costs of emissions reductions depend critically on the extent of global participation and international trading that a treaty is assumed to feature. But in addition to the dependence of the results from a given model on the precise assumptions, different models can give different answers even when all the assumptions are specified to be the same. A concrete illustration of the range of uncertainty to which we must assign the predictions of any one individual model. 4 One area in which the uncertainty is particularly large is the pace of technological progress, especially the diffusion of existing energy efficient technologies, but also the development of new technologies and the extent to which the pace will accelerate in response to government programs. Models and expert opinion on climate change policy tend to have a wide range of disagreement on the scope for speeding the diffusion of existing energy efficient technologies than on any other single issue. 4 Furthermore, each model has strengths and weaknesses; each has questions to which it is better or worse suited to answer. Some, for example, model the energy sector in detail. +%(Some allow for the fact that a coal-fired power plant cannot costlessly be converted to one that runs on natural gas. Some show the effects of hypothetical tax cuts made possible by the new revenues earned through the auction of emissions permits. Some are capable of showing recessions and booms. Others include a long-term carbon cycle model that can keep track of the accumulation of greenhouse gas concentrations in the atmosphere and their climatological effects. Some break down the rest of the world into regions and so can model international trade. No one model does everything, and therefore we must not rely blindly on the results of any one model or set of models. Professional judgement and economic intuition, along with diplomatic assessments, are also crucial. Benefits of Averting Climate Change H 4 As discussed above, it is evident that the benefits of averting climate change are potentially immense. But we have chosen not to try to quantify them in monetary terms, in light of the difficulties we have enumerated. These include the uncertainty of these benefits, their timing and therefore the extreme sensitivity of the results to the discount rate, and the dependence of benefits on emissions paths after the 2008 to 2012 budget periods specified in Kyoto. V. Assessing the Kyoto Protocol H & " 4 In order to evaluate the likely net economic impact of the Kyoto Protocol, excluding (!\$ the benefits of mitigating climate change itself, we have drawn upon a variety of tools to assess *#& the various possible costs and nonclimate benefits of the Administration's emissions reduction +%(policy. To give away the punchline, our conclusion is as follows: the net costs of four policies to reduce emissions are likely to be small, assuming those reductions are undertaken in an efficient manner and we are successful in securing meaningful developing country participation as well as effective international trading, and the Clean Development Mechanism in future negotiations. That potential small net premium, even excluding the benefits of mitigating climate change, in effect, purchases a partial insurance policy against a serious environmental

threat.⁴ Because the results from any model must be treated with caution, the Administration has employed a broad set of economic tools to assess the Kyoto Protocol. We have drawn on the insights of a wider range of models of the energy sector and economy over the next 25 years, including but not limited to the results of the Stanford Energy Modeling Forum exercises, the IPCC's review of the economic and social dimensions of climate change, the work of the OECD on Economic Dimensions and Policy Responses to Global Warming, and the staff level Interagency Analytical Team analysis produced last year. Other tools include simple relevant statistics, meta-analyses such as work by the World Resources Institute, models, and basic economic reasoning. Drawing on this broad array of analytical tools is crucial to an intelligent evaluation of the policy alternatives.

To our knowledge, no model whether used inside the government or not has yet been set up to analyze the implications of the Kyoto Protocol, since this agreement is only a few months old and remains unfinished. In particular, no model is currently designed to assess Kyoto's treatment of sinks, or all six greenhouse gases. Some model builders outside the government tend to take as long as several years to incorporate changes in policy parameters into their models.

Our thinking has been informed, however, by simulations conducted with the Second Generation Model of Battelle Laboratories, one of the leading models in the field. The SGM is one of the models best positioned to analyze the role of international trade in emission permits, which we consider to be a critical element of the Kyoto Treaty. However, the SGM does not cover all six gases included in the Kyoto Protocol or include a role for sinks. We have used the SGM model as one input into our overall assessment of the Kyoto treaty, but have attempted to supplement its results with additional analysis to account for such special features of the agreement as the inclusion of six gases, a possible trading arrangement that could include a subset of the Annex I countries and the Clean Development Mechanism. We will share with you today some preliminary results of this analysis. To the extent possible, we have compared results obtained with the SGM model with those of other modeling efforts.

Mindful of the limitations of any single model, we are eager to see features of the Kyoto Protocol assessed by other models to obtain a better feel for the range of possible effects. This work is just beginning and much of it will continue to go on outside the government. For example, the Energy Modeling Forum, based at Stanford University, is a long running model comparison exercise involving many of the leading climate models. EMF is currently studying how features of the Kyoto legal language can be translated into terms recognizable to economic modelers. We expect that the group will conduct a full scale analysis of the Kyoto Protocol. The Energy Modeling Forum believes that its members will need at least until mid-year to update their results.

VI. Assessing the Potential Costs of Emissions Reductions

I said in Congressional testimony last July that we can do this smart or we can do this dumb. I was referring to the point that the costs of cutting emissions can be much reduced if flexible, market based mechanisms are used. Our economic analysis highlighted the importance of such flexible, market based mechanisms which are therefore reflected, at the President's insistence, in the Kyoto Protocol and our ongoing diplomatic strategy.

Within the Kyoto Protocol, this means an insistence on international trading, Joint Implementation, the Clean Development Mechanism, and, ultimately, on meaningful developing country participation. Domestically, this means that we implement any emissions reductions through a market based system of tradeable emissions permits, which ensure that we achieve reductions wherever they are least expensive. But this also means taking serious and responsible steps in the short run to prepare us to meet our obligations in the longer term.

The first such step is the inclusion in this year's budget of an aggressive, \$6.3 billion program of tax cuts and R&D investments \$1.3 billion more than the \$5 billion package the President promised in his October 22 speech on this issue. The goal is both to stimulate the development of new energy saving and carbon saving technologies and to encourage the dissemination of those that exist already. The proposed package contains \$3.6 billion over the next 5 years in tax cuts for energy efficient purchases and renewable energy, including tax credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles, a 15 percent credit (up to \$2,000) for purchases of rooftop solar equipment, a 20 percent credit (subject to a cap) for purchasing energy efficient building equipment, a credit up to \$2,000 for purchasing energy efficient new homes, an extensi-

on of the wind and biomass tax credit, and a 10 percent investment credit for the purchase of combined heat and power systems. The package also contains \$2.7 billion over the next 5 years in additional research and development investments covering the four major carbon-emitting sectors of the economy (buildings, industry, transportation, and electricity), plus carbon removal and sequestration, Federal facilities, and crosscutting analyses and research. One example of the R&D effort is the Partnership for a New Generation of Vehicles (PNGV). PNGV is a government industry effort to develop attractive, affordable cars that meet all applicable safety and environmental standards and get up to three times the fuel efficiency of today's cars. In FY99, the combined proposal for PNGV is \$277 million, up from \$227 million appropriated in FY98. Similar government industry efforts are proposed to develop more efficient diesel engines for both light trucks and heavy trucks. 4 A second responsible step entails industry by industry consultation to prepare emission reduction plans in key industrial sectors. The Administration will work in partnership with industry to identify ways in which the Federal government might remove regulatory hurdles that discourage energy efficiency. In addition, DOE will spearhead a comprehensive effort to improve the energy efficiency of the Federal government's own operations and purchases. 4 XXXX X The third step is the promotion of an environmentally responsible electricity "H&" restructuring bill, which the President identified as part of his domestic climate change package in his address to the National Geographic Society on October 22. An electricity sector freed from government regulation would be a more efficient energy sector. Costs to consumers would +%(fall. In addition, stronger incentives for improved generation efficiency in conjunction with appropriate market based provisions could achieve modest reductions in emissions. A reasonable overall estimate of the contribution of federal electricity restructuring to the rest of the President's program to address climate change is that it would make further progress to the same emission reduction goal at a cost saving of roughly \$20 billion per year. These steps should be taken regardless of Kyoto, because they make sense in terms of energy efficiency. But they have the added benefit of preparing us for Kyoto. Estimated Reduction in Costs from Annex I Trading

4 In the language of the treaty, Annex I, is the set of countries that have agreed to a hard take on binding limitations in emissions of greenhouse gases. Even without meaningful developing country participation which, again, the President has emphasized is essential before the treaty would be submitted for ratification costs could be reduced substantially by emission trading among the Annex I countries. To provide some indication of the possible efficiency improvements, Russia and Ukraine consume six times as much energy per dollar of output as does the United States. Such large international differences in energy efficiency suggest that adoption of existing U.S. technology would yield very large emissions reductions in these countries. 4 Estimates derived from the SGM model confirm that emission trading among Annex I countries can reduce the cost to the United States of achieving its targets for 2008-2012 emissions by about half relative to a situation in which such trading was not available. This concept of costs is meant to capture aggregate resource costs to the U.S. economy, including the +%(cost to domestic firms for purchasing emission permits from other countries where emission reductions may be cheaper than in the United States. Although these estimates reflect idealized international trading in efficient markets, the overall conclusion is clear. The dramatic reduction in costs potentially available from Annex I trading within the SGM model cutting the costs involved by half highlights why the President insisted that international trading be part of the Kyoto Protocol; and why its achievement by our negotiators in Kyoto was such an important

accomplishment. Estimated reduction in costs from umbrella trading

4 One possibility

is that emerged in Kyoto, which none of us foresaw, was the idea that developed thereby the U.S. delegation, that the United States might undertake trading with a subset of Annex I countries, dubbed the umbrella. Countries that have expressed interest in the umbrella include the United States, Australia, Canada, New Zealand and Russia, with strong indications of interest from some others. This subset of Annex I countries shares a common interest in promoting market

based mechanisms, most specifically, fully flexible rules for international trading of emissions permits. It is too early to state the precise form the umbrella will take. But we can envision a number of potential benefits. The umbrella could, for example, greatly reduce costs to the U.S. Results that we have derived from various SGM simulations of efficient international trading (H&M) suggest that, relative to the situation in which there is no trading at all, the umbrella can reduce costs by an estimated 60-75 percent, depending on whether the former Warsaw Pact countries (Russia and others) fall within the umbrella. The Kyoto Protocol classifies these countries outside of the EU bubble (Russia and others) for the first budget period 2008-2012. Estimated reduction in costs from developing country participation (H&M) 4 The next consideration is participation by developing countries. The President has (H&M) said that he will not submit the treaty for ratification without meaningful participation by key developing countries. Such participation would further reduce the costs involved. 4 The substantial potential gains from meaningful developing country participation are highlighted by the significant benefits that will likely accrue from the limited role that the developing countries have already agreed to: the Clean Development Mechanism (CDM), modeled after the U.S. joint implementation concept. The CDM cannot realistically be expected to yield all the gains of binding targets for developing countries, but it might save costs by roughly another 20 to 25 percent from the reduced costs that result from trading among Annex I countries. 4 Another possibility is that we persuade some of the key developing countries that are the largest emitters to commit to targets, and allow us to buy emission reductions from those countries. Simulations with the SGM models suggest that full participation by non-Annex I countries (H&M) could cut roughly 55 percent off the reduced costs that result from Annex I trading. The actual cost reduction would depend on the extent of developing country participation that is ultimately obtained, as well as the effectiveness of international trading arrangements. The more (H&M) developing countries that take on modest binding targets and trade in international permit markets, the lower will be costs. 4 These cost-saving opportunities are fundamental tenets of the U.S. position. The (H&M) promise of Kyoto cannot be achieved without effective emission trading. Moreover, if we do not get meaningful participation by key developing countries, we won't submit the treaty for ratification to the Senate. So, while our analysis may be predicated on some ambitious conditions concerning trading and developing country participation, it is exactly those conditions that form the foundation of the U.S. position in international negotiations including those at Buenos Aires. Accounting for Carbon Sinks (H&M) 4 The preceding discussion has emphasized the importance of trading arrangements and the CDM. In reaching an overall economic assessment, it is also important to factor in the potential role of carbon sinks. Again, the U.S. delegation obtained an novel concept, that carbon absorbing activities called sinks could be used to offset emissions. The arrangements concerning carbon sinks in the Kyoto Protocol have received less attention than they merit. The Kyoto Protocol specifies that removal of CO₂ by sinks count toward meeting the target. The Kyoto Protocol counts the net emission effect of three sink activities: afforestation, reforestation, and deforestation. Very preliminary estimates of the implications for the United States of the Kyoto provisions on sinks indicate that carbon sinks could comprise a significant portion of the total required emissions reductions. Moreover, decreasing the required emissions reduction by, for example, 10% would likely result in cost savings greater than 10%.

H&M

4 Even this estimate of the effect of sinks is conservative in one respect: it is based on (H&M) an assumption for sink activity in the U.S. over the 2008-2012 period, and no assumed benefits from sinks elsewhere in the world. Very preliminary estimates suggest that incorporating the (H&M) gains from sinks throughout the world can substantially reduce the costs of meeting the Kyoto target, on top of the gains from trading among Annex I countries. (Furthermore, no model has yet even tried to take into account that government policies can help increase the activities qualifying as allowable sinks, like some tree planting.) Because the quantitative uncertainty is so large, we do not yet have an estimate with which we are comfortable. But we expect that a complete modeling of the Kyoto provision pertaining to sinks will likely have favorable

and potentially large effects on projected costs. Accounting for the role of improvements in energy efficiency

4 Another issue in analyzing the Kyoto protocol concerns future improvements in energy efficiency due to innovation and diffusion of existing technology. The parameter that figures most prominently in an analysis of energy efficiency is the rate of improvement in the so-called Autonomous Energy Efficiency Index (AEEI), that is the rate at which the total use of energy falls relative to GDP. A plausible assumption on the AEEI is an improvement of 1.0 percent per year. Reflecting a conservative interpretation of the 15 year impact of various climate change initiatives, this is only a small increase above the 0.9 percent number in the Energy Information Administration's Annual Energy Outlook. That assumption is not the most "optimistic" outcome that might occur. Some authorities in the field of energy policy forecast more rapid technological progress. Experts at five national laboratories managed by the Department of Energy, using an engineering approach rather than an economic paradigm, found that a third of the emissions reductions necessary to return to 1990 levels by 2010 could be achieved through the adoption of existing energy efficient technologies at no net resource cost, +%(oreven some savings. The National Academy of Sciences reached qualitatively similar conclusions in a 1992 report.⁴ The President's FY 1999 budget, as I have noted, includes a \$6.3 billion package of tax cuts and R&D investments intended to spur the discovery and adoption of new technologies. If the Administration is successful in this effort, the rate of improvement in energy efficiency could rise and such improvements would lower the cost of meeting our Kyoto target. For example, published results based on SGM model simulations with different assumed rates of AEEI suggest that an increase in the AEEI of 25 percent could lead to a decline in the permit price of approximately 40 percent.⁴ Our justification for incorporating in our assessment a small assumed impact of Administration technology policies is somewhat analogous to the Administration's rationale for employing mainstream economic assumptions in our budget forecasts: in the presence of uncertainty, we are conservative in our estimates of the speed with which the economy will grow, tax receipts will rise, and the budget will improve. That way, any revisions or surprises that occur are likely to be in the pleasant direction. In this instance, we prudently and conservatively assume that there will be substantial delay between investments in new technology or the diffusion of existing technology, and the return to such investments.⁴ Moreover, at the recent automobile show in Detroit, General Motors announced that it has developed a hybrid based vehicle that can achieve fuel efficiency of 80 miles per gallon, and that this car could be in commercial production within a few years. Ford also exhibited a prototype of a lightweight highly fuel efficient sedan that could be in commercial production by +%(the middle of the next decade. These announcements followed an earlier breakthrough announced by DOE and its partners of a fuel cell that could run on gasoline and double current fuel economy while reducing conventional air pollution emissions by 90 percent. These technological advances have been made possible through the efforts of the Partnership for a New Generation of Vehicles between the Administration and the U.S. auto companies and their suppliers.⁴ Such progress may be replicated in other sectors. VCRs and TVs, while switched off, consume about \$1 billion worth of electricity annually. EPA has established a partnership with major manufacturers that has a goal of achieving up to a 70 percent reduction in energy use by VCRs and TVs while they are switched off, without sacrificing product quality, usefulness, or increasing costs. This partnership offers promise of substantial improvement in energy efficiency. Non-Climate Benefits 4 A final factor that should be included in any comprehensive assessment of the economic implications of the Kyoto protocol are the benefits of the agreement. The literature has emphasized that any relative price shifts that prove necessary to reduce emissions should produce non-climate benefits in three areas: traffic congestion, highway accidents, and air pollution unrelated to climate change. These benefits are hard to quantify precisely but are potentially significant: our rough estimates suggest that these three benefits could offset approximately a quarter of the resource cost of the climate change policy. Synthesis +%(4 A comprehensive evaluation of -` h4X- the economic impact of the Kyoto Protocol must integrate all of the factors described above: reliance on flexible market based mechanisms domestically; international trading and Joint Implementa

tion among Annex I countries; the Clean Development Mechanism; meaningful developing country participation; the potential cost mitigating role of including six gases and carbon sinks; the benefit of electricity restructuring; and emissions reductions achieved as a consequence of other proposed Administration climate change initiatives. Assuming that effective mechanisms for international trading, Joint Implementation and the Clean Development Mechanism are established, and assuming also that the U.S. achieves meaningful developing country participation, our overall assessment is that the economic cost to the United States in aggregate and to typical households of attaining the targets and timetable specified in the Kyoto Protocol, will be modest. This conclusion that the impact will be modest is not entirely dependent upon, but is fully consistent with, formal model results. I have previously emphasized the limitations of relying on any single model in assessing the economic impact of the Kyoto Protocol, and continue to view any such results as just one input into an overall analysis. But it is worth emphasizing that model results reflecting the details of the Kyoto Protocol are consistent with our conclusion. For example, under the assumption of either trading under the umbrella or within Annex I, the CDM and permitting trading with developing countries, estimates derived using the SGM model, which adjust for the inclusion of six gases and assume a little banking of credits beyond 2012, suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to \$7 to \$12 billion per year in 2008 to 2012. This implies that overall costs, excluding not only +%(climate and nonclimate benefits, but also such cost mitigating factors as sinks and payoffs from the President's electricity restructuring and climate change initiatives, would reach roughly one tenth of one percent of projected GDP in 2010. A more tangible measure of costs is the estimated effect on energy prices. Excluding the impact of electricity restructuring and the ancillary benefits of mitigation and better forest management, the SGM based estimate, corresponding to the gross resource cost estimate cited above, is an emissions price in the range of \$14 to \$23 per ton of carbon equivalent. This translates into an increase in energy prices between 2008 and 2012 at the household level of between 3 and 5 percent, an increase in fuel oil prices of about 5 to 9 percent, natural gas prices of 3 to 5 percent, gasoline prices of 3 to 4 percent (or around 4 to 6 cents per gallon), and electricity prices of 3 to 4 percent. This increase in energy prices at the household level would raise the average household energy bill in ten years by between \$70 and \$110 per year, although such predictions may not be observable because they would be small relative to typical energy price changes, and nearly fully offset by electricity price declines from Federal electricity restructuring. In particular, this increase in energy prices is small relative to the average of year @ to year real energy price changes experienced by U.S. consumers since 1960: such annual " changes have averaged 3.8 percent. In addition, by 2008 to 2012, the anticipated 10 percent decline in electricity prices from the restructuring that is part of our climate change agenda is projected to lead to expenditure reductions of about \$90 per year for the average household.

As highlighted earlier, there are substantial but unavoidable uncertainties surrounding *#& estimates like these. For example, the estimate just discussed is predicated, among other things, +%(on the developing country participation that we are insisting upon as a condition for our ratifying the Kyoto Protocol, but which is not yet part of that Protocol, and on effective international trading. Moreover, other models will yield other answers and much work remains to be done by the modeling community to test the robustness of these results. Preliminary comparisons of the SGM model to the few other models that have attempted to evaluate the Kyoto accord, suggest that its predictions concerning the impact of the Kyoto Protocol on carbon permit prices are neither the most conservative nor the most optimistic of the models that have been developed. The predictions of the SGM model are robust in the sense that virtually all energy models reveal the potency of effective, flexible, domestic and international trading mechanisms to reduce substantially the cost and energy price impact of meeting the Kyoto targets. Of course, the most important factor that has been left out of the above assessment is the benefit of mitigating climate change itself. A full cost benefit analysis would include mitigation in the benefits column. The only reason we have not done so, explained repeatedly above

, is the difficulty in coming up with a number to capture the monetary benefits. But nobody should lose sight of our ultimate objective: keeping our planet the hospitable home that we enjoy today. Effect on employment and aggregate output " So far we have said nothing about job losses resulting from climate change policy. Although there may be job gains in some sectors and job losses in others, we do not anticipate any significant aggregate employment effect if we achieve the conditions we have discussed. The effects on energy prices described above will occur only 10 to 14 years in the future. Not only are these effects small relative to historical variations in energy prices, and offset by other policies like electricity restructuring, they would occur sufficiently far in the future to enable monetary policy to keep the economy operating at its potential. In energy-intensive sectors some employment reduction could occur, although given the very small predicted change in energy prices, impacts in most sectors are apt to be minimal. Furthermore, a large number of jobs will be created in other sectors; many of them high-tech jobs paying high wages. The President is firmly committed to assisting any workers who are adversely affected during the transition to a climate-friendly economy.

VII. Conclusion In conclusion, the Kyoto Protocol and the President's general approach to climate change reflect the insight of the economic analysis. The Kyoto Protocol includes key provisions on international trading and Clean Development projects. The President's approach relies on market incentives first, with a system of tax cuts and R&D investments, and then later with a market-based system of tradeable permits to ensure that our objectives are achieved as efficiently as possible. Our overall conclusion is that the economic impact of the Protocol will be modest under the conditions we have identified. The purpose of this testimony has been to explain the reasoning underlying this conclusion, which draws insights from not only the forecasts of individual models, any one of which has its own strengths and limitations, but also a broad variety of additional analyses. I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Protocol and evaluating the net effects of reducing greenhouse gas emissions. It is my hope that the economic analysis will continue to play a key role in designing policies in this area. I welcome your questions. ===== END ATTACHMENT 1 =====

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**ORAL TESTIMONY OF DR. JANET YELLEN
CHAIR, COUNCIL OF ECONOMIC ADVISERS
BEFORE THE HOUSE COMMERCE COMMITTEE
ON THE ECONOMICS OF THE KYOTO PROTOCOL
MARCH 4, 1998**

Thank you, Mr. Chairman. The President has said that we can work to avert the grave dangers of climate change, while at the same time maintaining the strength of our economy. I agree and am pleased to have this opportunity to appear before the Committee to elaborate on the Administration's views on these issues.

The international agreement that was reached in Kyoto this past December is a crucial step forward in addressing global climate change. But it is only one step in a long journey. Since the international effort to reduce greenhouse gas emissions is still in some respects a work-in-progress, it is not yet possible to provide a full authoritative analysis of it. In my testimony today, I will attempt to identify key elements of the agreement and the Administration's policy, such as international emissions permit trading, meaningful developing country participation, the inclusion of land-use activities that absorb carbon ("sinks") and six categories of gases, as well as domestic initiatives, that can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth.

Effects of Climate Change

The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that "the balance of evidence suggests that there is a discernible human influence on global climate." Current concentrations of carbon dioxide, methane, nitrous oxide, and the other

so-called greenhouse gases have reached levels well above those of preindustrial times. As a result of the increased concentration of greenhouse gases, the IPCC estimates that global temperatures will increase by between 2 to 6 degrees Fahrenheit in the next 100 years, with a best guess of about 3.5 degrees Fahrenheit. The IPCC reports that a doubling of carbon dioxide levels would lead to approximately 10,000 additional deaths per year for the current U.S. population from higher summer temperatures, even after netting out the effects of warmer winters and acclimatization. The IPCC also predicts sea level increases of about 20 inches by 2100, with greater increases in subsequent years. Despite the difficulties of deriving quantitative assessments of the damages from climate change, researchers have nonetheless developed monetary estimates of damages that prompt substantial concern, and range in tens of billions of dollars per year for temperature changes projected to occur in the next century. If left uncontrolled, disruption of the Earth's climate may thus pose substantial costs in terms of harm to commerce and the environment alike. These costs--and they are significant--provide the primary motivation for actions to reduce greenhouse gas emissions.

These estimates do not, and cannot, accurately reflect the value of reducing the unknown risk of large-scale and potentially irreversible events with potentially catastrophic consequences, such as warming of the Northern tundra sufficient to release very large amounts of methane from the permafrost. There is thus a strong argument for the Kyoto Protocol as a form of insurance against a serious environmental threat.

Kyoto Protocol

To address climate change, the United States and approximately 160 other nations

agreed in negotiations held in Kyoto, Japan, last December, to reduce emissions of greenhouse gases. The Kyoto Protocol, which requires the advice and consent of the Senate, would place binding limits on each industrial country's combined emissions of the six principal categories of greenhouse gases. These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries.

In taking action to reduce emissions, economic analysis suggests that two elements are absolutely essential: the effort must be flexible and market-based, to ensure that we reduce emissions in the most efficient way; and the effort must be global, for without global emissions reductions the effort would be ineffective. The nature of the climate change problem--that greenhouse gas emissions have the same effect on the climate regardless of how, where, and, within limits, when they occur--suggests three basic methods to lower the cost of achieving given levels of environmental protection. We term these “when”, “what”, and “where” flexibility.

As a result of U.S. diplomatic efforts, all three forms of flexibility are broadly reflected in the Kyoto Protocol. The choice of a multi-year budget period, ending later than many countries proposed, with allowance for “banking” of emissions reductions, constitute key elements of “when flexibility.” These provisions mitigate costs by permitting reductions at times when they are less rather than more costly. The inclusion of all six greenhouse gases and certain sink activities that promote removal of carbon from the atmosphere provide substantial “what flexibility”. The U.S. succeeded in having the Kyoto Protocol stipulate that countries with binding targets are to reduce greenhouse gas emissions by certain percentages, but does not

require specific reductions for specific gases. Moreover, sinks can be used to offset emissions target. The inclusion of international emissions trading among countries that take on binding targets, coupled with an agreement allowing industrial countries to receive emissions reduction credit for certified investments in “clean development” projects in the developing world, are the critical forms of “where” flexibility incorporated in the Kyoto Protocol. Although details of these provisions need to be finalized in negotiations in Buenos Aires later this year, we believe that these mechanisms can produce substantial reductions in the costs of attaining our environmental objectives.

The problem of climate change is global and so requires a global solution. Around 2030, under a continuation of business as usual, a majority of world emissions are projected to come from developing countries. Without developing country participation we cannot achieve adequate climate protection. In addition, developing country participation would permit relatively low-cost emissions reductions to be internationally recognized as a substitute for more expensive reductions in many industrial countries. The President has made clear that he will not submit the Kyoto Protocol to the Senate without meaningful participation from key developing countries (who are not included in Annex I).

Economic Effects

An economic analysis of climate change faces three broad categories of difficulties. First are the uncertainties that still remain over the terms of the ultimate treaty. Second are the inherent limitations of available models to analyze even short-term costs and benefits. And finally is the impossibility of putting a single monetary number on the long-term benefits of

climate change mitigation.

Mindful of the limitations of any single model as a tool for evaluating the economic impact of the Kyoto Protocol, we have employed a broad array of techniques to assess the various possible costs and non-climate benefits of the Administration's emissions reduction policy. Ignoring the benefits of mitigating climate change itself, our conclusion is that the net costs of our policies to reduce emissions are likely to be small if those reductions are undertaken in an efficient manner and we are successful in securing meaningful developing country participation as well as effective international trading and clean-development mechanisms in future negotiations. As I explain in my written testimony, this conclusion is not entirely dependent on, but is fully consistent with, formal model results. For example, given the factors, such as trading, delineated above, but excluding the benefits of acting and the impact of electricity restructuring, estimates derived using the SGM model suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to just \$7 to \$12 billion per year in 2008 to 2012 -- or just 0.1 percent of projected GDP. That small net premium, in effect, purchases a partial insurance policy against a serious environmental threat.

A comprehensive economic evaluation of the Administration's climate change policies must also take into account the potential payoffs from the full package of proposed Administration climate change initiatives. As you know, the President's FY 1999 budget includes a \$6.3 billion package of tax cuts and R&D over the next 5 years; this package makes good sense in terms of energy policy and will jumpstart our efforts. A second responsible step entails industry-by-industry consultations to prepare emission reduction plans in key industrial

sectors. A final component of the President's climate change policy is his support for electricity restructuring in a manner that will offer approximately \$20 billion in cost savings to electricity consumers, while offering modest reductions in greenhouse gas emissions.

I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Protocol and evaluating the effects of reducing greenhouse gas emissions.

I welcome your questions.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 3-MAR-1998 00:39:40.00

SUBJECT:

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

See edits please.===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D45]MAIL47223016S.026 to ASCII,
The following is a HEX DUMP:

BACKGROUND FOR TESTIMONY ON CLIMATE CHANGE

March 4, 1998

draft

President Clinton is committed to addressing the problem of global climate change while maintaining a strong economy. President Clinton has said that we can work to avert the grave dangers of climate change, while at the same time maintaining the strength of our economy.

The Kyoto Protocol is a form of insurance against a serious environmental threat. It is difficult to put a price tag on the cost of doing nothing to address the problem of climate change. But researchers have nonetheless developed troubling cost estimates of not acting --ranging in the tens of billions of dollars per year for the United States. And, these estimates do not even fully reflect the value of the insurance against the unknown risk of large-scale and potentially irreversible catastrophic events, such as a shifting of the Gulfstream.

Doing it smart: The Kyoto Protocol is based upon measures that reduce costs. The least-cost approach to controlling climate change is to reduce emissions where and when such reductions are cheapest. Dr. Yellen's testimony highlights the substantial cost reductions that are associated with international emissions permit trading, joint implementation by Annex I countries, the Clean Development Mechanism, and other aspects of the Kyoto Protocol. Because of U.S. insistence, the Kyoto Protocol includes many such cost-saving provisions -- and economic analyses that ignore these provisions do not accurately reflect the economic impact of the Kyoto Protocol. In addition, the Administration supports federal electricity restructuring legislation that could achieve modest emissions reductions and will provide consumers with substantial savings.

Conclusion: Costs will be modest, even without accounting for benefits of electricity restructuring or the value of insurance against a serious environmental threat. With effective mechanisms for international emissions permit trading, joint implementation, and the Clean Development Mechanism, as well as meaningful developing country participation and flexible timetables, the Administration's overall assessment is that the economic cost to the United States will be modest.

This conclusion is not entirely dependent on, but fully consistent with, formal model results. Despite the limitations of any single model in assessing the economic impact of the Kyoto Protocol, economic model results are fully consistent with this conclusion. For example, given the factors, such as international permit trading, delineated above, but excluding the benefits of reducing emissions and the impact of electricity restructuring, estimates derived using the Second Generation Model (SGM) suggest that the resource costs of attaining the Kyoto targets for emission reductions might amount to just \$7 to \$12 billion per year in 2008 to 2012 -- or just 0.1 percent of projected GDP.

Modest impact on family energy costs. With a successful international trading regime, the SGM-based estimate suggests an emissions price in the range of \$14 to \$23 per ton of carbon equivalent. Not including the impact of Federal electricity restructuring, that would translate into an increase in the average family's energy bill of between \$70 - \$110 per year in 2010. But, the energy price declines from Federal electricity restructuring would likely be enough to offset the impact described above -- so that the net effect on family energy bills, of the Administration's policies, including the impact of electricity restructuring, would be negligible in 2010.

Cost estimates do not reflect \$6.3 billion package of insurance against the environmental threat. The figures cited in Dr. Yellen's testimony exclude not only climate and non-climate benefits, but also such cost-mitigating factors as carbon sinks and increases in energy efficiency from the President's \$6.3 billion climate change initiative.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 4-MAR-1998 18:57:31.00

SUBJECT: want to go to China? CEA-SPC

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Jon D. Haveman (CN=Jon D. Haveman/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: HOPKINS_M (HOPKINS_M @ A1 @ CD @ VAXGTWY [UNKNOWN]) (CEA)

READ:UNKNOWN

CC: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

Lael Brainard (CN=Lael Brainard/OU=CEA/O=EOP [CEA])

READ:UNKNOWN

TEXT:

Janet

We will try to discuss this at 2:30 tomorrow. Logically, you would reciprocate their visit here of last June by going sometime between May and August (Joe went in August 2 years ago). The State Dept. (DAS Susan Shirk) is eager to use this venue to advance US-China dialog/advice in light of the Asian crisis. She is leaving town Friday, China-bound. If you are sure you don't want to go to Beijing, then we should tell her now, so that she doesn't stir anything up while she is over there.

JF

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 4-MAR-1998 20:09:42.00

SUBJECT: mtg. Fri. to discuss LDCs and GCC

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

CC: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

CC: Adele C. Morris (CN=Adele C. Morris/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

CC: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

Alice H. Williams (CN=Alice H. Williams/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

Lisa D. Branch (CN=Lisa D. Branch/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TEXT:

Janet,

I would like us five to meet sometime Friday to discuss what should be the CEA position on emission targets for developing countries. I enclose a write-up of the two key points I think we have to offer in the inter-agency process. After we have discussed them, and revised them along whatever lines you suggest, I propose that we circulate them soon as a memo. (I also propose we attach the cross-country plot of emissions per capita against GDP per capita, with regression line, that Joe did in November. The point of this is that if we offer some evidence that we have thought with some degree of rigor about this problem, it might put our arguments a notch above those of the ten other agencies who presume at meetings that anybody's idea is as good as anybody else's).

The status quo on this subject is that State is drawn to negotiate bilateral deals with Argentina, South Africa, etc. one-by-one, with ad hoc definitions of meaningful participation that are not necessarily desirable from our point of view. The closest thing to a systematic approach to emission targets is the unedifying USAID paper, which among other things implies that we should make no demands on small countries.

Recall that I am away next week (and you thereafter).

JF===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D12]MAIL41062036R.026 to ASCII,
The following is a HEX DUMP:

Proposal for CEA position on targets for developing countries (i.e., the strong form of “developing country participation”)¹

1. It would be useful to get LDCs to agree to binding limits, even if they involved no (or little) cuts below BAU. Reasons:

- We want to forestall increases over BAU, in response to Annex I cuts (leakage)
- The ability for Annex I countries to buy reductions from LDCs would greatly reduce the costs of meeting our targets (as CEA testimony showed).
- *With targets close to BAU, the LDCs would benefit from the ability to sell emission permits. This actually gives them a genuine economic incentive to join, which is otherwise lacking.*
- Agreement on modest targets in the nearer term is the first step to drawing LDCs into the system, where larger cuts relative to BAU may be possible in the longer term (in some proportion to the cuts made by richer countries that have gone before them).

¹ There is no presumption that LDCs are likely to agree to this, or that the Administration would necessarily hold out for such an ambitious definition of meaningful participation before submitting the treaty. This is simply an alternative track to CDM, etc.. We think the U.S. should have an answer ready if some small country asks: “Suppose we were willing to consider a binding commitment. What emissions target does the U.S. think is fair?”

2. It might be useful to phrase LDC targets as a formula (intended approximately to replicate BAU on an ex ante basis²). Reasons:

- It is hard to know what the right BAU estimate for a given small poor country is, ex ante.
- Even if we think we know, it will be hard to get agreement. It would require protracted self-serving negotiations with each country one-by-one. Simpler and fairer to agree on a uniform formula that generalizes.
- *Even an optimal forecast ex ante could turn out very poor ex post -- e.g. unintentionally stringent.* Ten years ago one would have predicted that Korean growth in the coming century would be far more rapid than Slovenia's growth; looking forward from today, the opposite could be true. If countries' future growth rates turn out to be very different from what was anticipated when a binding BAU path was established, they will simply refuse to abide by them.
- Such a formula would constitute tangible proof that we are not preventing them from growing rapidly
- Compared to pragmatic alternative approaches that determine future targets from past emissions, a formula that puts less weight on past emissions minimizes the incentive for countries to maximize emissions in the near term in order to have a higher base allocation in the future.

² An example of such a formula, which we have fit econometrically to actual data, expresses future emissions per capita as a log-linear combination of GDP per capita and current emissions per capita.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 5-MAR-1998 13:52:38.00

SUBJECT: electricity restructuring

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

CC: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Peter O mentioned that the final electricity memo went to the President. He expects that there will be a meeting about it because the Vice President is siding with CEQ on the cap and trade issue. He thinks that DOE will be amply represented, and that EPA will probably be invited. He thought that Larry might also be invited. I suggested that you should be invited because of your testimony, but he said that someone else would be deciding who gets to attend.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Sanders D. Korenman (CN=Sanders D. Korenman/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 5-MAR-1998 10:31:13.00

SUBJECT: Gingrich testimony on EEOC funding

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Rebecca M. Blank (CN=Rebecca M. Blank/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

CC: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

In case you missed it, Newt Gingrich spoke before the House Subcommittee on Employer-Employee Relations Tuesday in support of Administration proposals to substantially increase EEOC's funding. However, he conditioned it on reforms (some of which the Administration proposed) AND "an agreement by the EEOC not to use its scarce resources for employment testers."

He argued that the use of testers undermines the credibility of the EEOC, causes innocent business to waste resources (interviewing candidates not interested in actual employment), "but also puts the government in the business of entrapment."

EEOC has supported the use of testers, but recently became actively involved in financial support of a testing program last December.

Gingrich acknowledged in the hearing that in some circumstances, where a number of charges has been filed with the commission, the use of testers might be plausible.

The reaction of an EEOC commissioner interviewed for a DLR article was that dropping a tiny, "fledgling" testing program was a small price to pay for a sorely needed 15% increase in their budget.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 9-MAR-1998 13:09:41.00

SUBJECT: EPC Meeting

TO: Jeremy B. Rudd (CN=Jeremy B. Rudd/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

I will be away all next week and am thus eager to plan for the EPC meeting this week. Are any of the documents available at this time? If we can get the Main Issues paper we could schedule a meeting with the rest of the delegation and divvy up responsibilities. At any rate, I need to talk to you as soon as possible about how we will handle things to prepare. If you have time this afternoon, it would be good to chat.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 9-MAR-1998 23:25:55.00

SUBJECT: CEA answers for Senate Foreign Relations Questions

TO: Adele C. Morris (CN=Adele C. Morris/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

State Department asked us to answer several of the questions they received from Senate Foreign Relations after Stu's first hearing. Apparently, they are under a lot of pressure to get answers back soon, and would like to hear from us ASAP. Michele and Janet, I would like for you to look over these (especially the first and last questions -- there are only 4). Feel free to drop off a marked up version with your comments, or email/call me and I'll stop by to discuss. Thanks.

Joe

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D96]MAIL43005876Z.026 to ASCII,
The following is a HEX DUMP:

CEA Responses to Written Questions Submitted by the Senate Committee on Foreign Relations

Hagel

10. Last year, the Administration abandoned a year and half-long effort to develop an economic model that would show that we could make major cuts in energy use in this country without harming our economy. The Chair of the Council of Economic Advisers went so far as to call economic modeling “futile.” On February 4, 1998 the Chair of the Council on Environmental Quality, Kathleen McGinty said before the House Science Committee, “The Administration is working on a more detailed economic analysis of the impacts of the targets reached in Kyoto. Council of Economic Advisers Chair Janet Yellen will be prepared to discuss the analysis at a hearing next week before the Senate Foreign Relations Committee.” Can you tell me why the Administration did not produce either Janet Yellen as a witness or the promised detailed economic model or analysis?

Option 1: Dr. Yellen could not participate in this hearing because of her obligations associated with the release of the Economic Report of the President. It would not be appropriate for the Administration to submit the economic analysis to the Committee without also providing a witness to give an oral and a written statement explaining its details and to answer questions. Dr. Yellen did testify before the House Commerce Committee and the Senate Agriculture Committee on the Administration’s economic analysis.

Option 2: Dr. Yellen was prepared to give an oral and a written statement on the Administration’s economic analysis, however, last minute Committee staff restrictions on her testimony, which would not allow adequate time for interagency review of the testimony, made it impossible for her to testify. It would not be appropriate for the Administration to submit the economic analysis to the Committee without also providing a witness to give an oral and a written statement explaining its details and to answer questions. Dr. Yellen did testify before the House Commerce Committee and the Senate Agriculture Committee on the Administration’s economic analysis.

12B. Is there currently in place any interagency body within the Executive Branch that has the responsibility to analyze the economic implications to the nation of the emissions reduction requirements specified in the Kyoto Protocol for the United States and of alternative domestic policies to achieve those reduction requirements?

No. (Is there anything else we would like to say?)

12B.1. If yes, what is the name of that interagency body? Who is the chair of that body? Are you a member of that body?

Not applicable.

33.1. Do you believe that, until the Conference of the Parties makes all of the decisions that it is empowered to make under those Articles of the Kyoto Protocol, it will be impossible for either the Administration or the Congress to know the extent to which those articles -- in reality -- would or could reduce the nation's cost of complying with the emissions reduction requirement set forth in the Protocol?

The Kyoto Protocol establishes international trading of emissions rights across Annex I countries. The Administration's policy is to secure rules that ensure an effective international market for emissions rights. It is impossible to know exactly the magnitude of the cost reduction associated with international trading, because of many uncertainties.

Some of these uncertainties will be addressed in subsequent negotiations, however, many uncertainties are associated with the inability to precisely predict the state of the U.S. and global economies a decade from now. It is possible to draw from the economic literature on trading, descriptive statistics of Annex I economies, and the results from modeling exercises to illustrate the substantial gains possible through international trading. The finding that effective international trading can significantly reduce compliance costs is quite robust.

Helms

In addition to your assertions of increased energy efficiency, and international emissions trading, please detail how the Administration intends to reach these enormous commitments without constraining U.S. economic growth?

(Should we simply attach a copy of Janet's testimony before Commerce/Ag?)

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Aaron S. Edlin (CN=Aaron S. Edlin/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 9-MAR-1998 18:37:36.00

SUBJECT: auto choice

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

Janet,

What do you think of These revisions to that memo, particularly the paragraph for the recommendation section, that follows the bold type.

Proposed changes to the second paragraph on page three of the Auto Choice memo to the President.

The Per-mile premium option addresses this problem and could decrease driving substantially, leading to fewer accidents and automobile fatalities, less congestion and large environmental benefits. Nonetheless, we believe that we could not sustain support for it in its current form. While we would argue that the average premium for drivers would fall under CEA's proposal, and that only those who chose the no-fault option would pay by the mile, opponents would counter that we are "taxing" each mile that families drive.

Paragraph on CEA position on CEA proposal for recommendation section.

The CEA believes that the benefits from switching auto insurance from a per-year basis to a per-mile basis from reduced premiums, reduced pollution, and reduced fatalities would be dramatic, and would make Auto Choice good policy if it were packaged with per-mile premiums. The politics suggest that for now we work to develop ways to facilitate the voluntary adoption of per-mile premiums, and thereby avoid the potential political pitfalls of being charged with "taxing" miles.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:10-MAR-1998 10:43:05.00

SUBJECT: Re: EPC Meeting

TO: Jeremy B. Rudd (CN=Jeremy B. Rudd/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

That probably makes sense, although I am not sure what it accomplished.

We could just confer with John Weeks directly if we want him to participate in some way, couldn't we?

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:10-MAR-1998 11:26:56.00

SUBJECT: Answers to Foreign Relations Committee testimony.

TO: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Michele Jolin (CN=Michele Jolin/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Joseph E. Aldy (CN=Joseph E. Aldy/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

Attached are my suggested edits. ===== ATTACHMENT 1 =====
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D75]MAIL49428486B.026 to ASCII,
The following is a HEX DUMP:

CEA Responses to Written Questions Submitted by the Senate Committee on Foreign Relations

Hagel

10. Last year, the Administration abandoned a year and half-long effort to develop an economic model that would show that we could make major cuts in energy use in this country without harming our economy. The Chair of the Council of Economic Advisers went so far as to call economic modeling "futile." On February 4, 1998 the Chair of the Council on Environmental Quality, Kathleen McGinty said before the House Science Committee, "The Administration is working on a more detailed economic analysis of the impacts of the targets reached in Kyoto. Council of Economic Advisers Chair Janet Yellen will be prepared to discuss the analysis at a hearing next week before the Senate Foreign Relations Committee." Can you tell me why the Administration did not produce either Janet Yellen as a witness or the promised detailed economic model or analysis?

Dr. Yellen was unable to complete preparation of testimony by the Committee's deadline with adequate time for interagency review and to participate in this hearing because of her obligations associated with the release of the Economic Report of the President. Dr. Yellen did testify before the House Commerce Committee and the Senate Agriculture Committee on the Administration's economic analysis.

12B. Is there currently in place any interagency body within the Executive Branch that has the responsibility to analyze the economic implications to the nation of the emissions reduction requirements specified in the Kyoto Protocol for the United States and of alternative domestic policies to achieve those reduction requirements?

No, there is no interagency team charged with this analysis. However, the National Economic Council has coordinated and continues to coordinate, interagency discussions of various aspects of the Administration's climate initiative.

12B.1. If yes, what is the name of that interagency body? Who is the chair of that body? Are you a member of that body?

Not applicable.

33.1. Do you believe that, until the Conference of the Parties makes all of the decisions that it is empowered to make under those Articles of the Kyoto Protocol, it will be impossible for either the Administration or the Congress to know the extent to which those articles -- in reality -- would or could reduce the nation's cost of complying with the emissions reduction requirement set forth in the Protocol?

The Kyoto Protocol establishes international trading of emissions rights across Annex I countries. The Administration's policy is to secure rules that ensure an effective

international market for emissions rights. It is impossible to know exactly the magnitude of the cost reduction associated with international trading, because of many uncertainties.

Some of these uncertainties will be addressed in subsequent negotiations, however, many uncertainties are associated with the inability to precisely predict the state of the U.S. and global economies a decade from now. It is possible to draw from the economic literature on trading, descriptive statistics of Annex I economies, and the results from modeling exercises to illustrate the substantial gains possible through international trading. The finding that effective international trading can significantly reduce compliance costs is quite robust.

Helms

In addition to your assertions of increased energy efficiency, and international emissions trading, please detail how the Administration intends to reach these enormous commitments without constraining U.S. economic growth?

In addition to increased energy efficiency and international emissions trading among Annex I countries, substantial cost reductions are possible if key developing countries can be persuaded to commit to quantitative targets enabling them to participate in international emissions trading arrangements. Significant benefits should also accrue from the more limited role that developing countries have already agreed to: the Clean Development Mechanism. A number of additional factors can also play a role in enabling the United States to meet its target without constraining economic growth. These include the use of carbon absorbing sinks to offset greenhouse gas emissions and the flexibility allowed by the Kyoto Protocol to meet the U.S. target through reductions in all six greenhouse gases and not just CO₂ alone. The President has also indicated his support for legislation to unleash competition in the electricity industry. Such legislation could lower electricity prices significantly for American consumers and also reduce greenhouse gas emissions. [Further details concerning the Administration's analysis of how the Kyoto targets can be attained without constraining U.S. economic growth are contained in the attached testimony of Janet Yellen before the House Commerce Committee.]

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Jeremy B. Rudd (CN=Jeremy B. Rudd/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:10-MAR-1998 10:47:19.00

SUBJECT: Re: EPC Meeting

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

My impression was that Main Treasury was going to brief John Weeks for the meeting; I don't know whether that really happened. (In any case, I don't recall John speaking at any time during the meeting.) I can ask someone in Joe Gagnon's office how they feel; my main concern is not to have Treasury feel as though it's being shut out in any way.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Rebecca M. Blank (CN=Rebecca M. Blank/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:11-MAR-1998 11:59:02.00

SUBJECT: Today's WEB

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])

READ:UNKNOWN

TEXT:

Janet --

I know you're going to sit down this afternoon to be sure you've got everything for today's WEB. Just a minor suggestion -- if I were you, in introducing the topic of disadvantaged youth, I'd pull together a few of the statistics from recent WEBs and data releases on unemployment rates, idleness rates, and (especially among minority youth) incarceration rates, just to provide an impetus for why we care. But you may already be planning this.

Becky

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:12-MAR-1998 16:06:38.00

SUBJECT: OECD notes from November

TO: Jeremy B. Rudd (CN=Jeremy B. Rudd/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

===== ATTACHMENT 1 =====

ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D30]MAIL40200607I.026 to ASCII,
The following is a HEX DUMP:

ELECTION OF VICE CHAIRMAN

- It is my pleasure to open our fall meeting of the Economic Policy Committee. We have an extremely stimulating agenda for this meeting. Before we move into that agenda, our very first order of business this morning is the election of a Vice Chairman of our Committee to replace Mr. Buenger of Germany. I would therefore like to open the floor for nominations. I would like to call upon Mr. Schatz of Germany to make a nomination to this post.
- Mr. Schatz nominates Mr. Okita of Japan.
- I would like to call upon Mr. Budd to second that nomination.
- I would like to congratulate Mr. Okita and say that the committee is fortunate that he is willing to serve in the capacity of Vice Chair. He brings considerable expertise and a wealth of experience to this post and we all look forward to working with him.

OPENING REMARKS

Now, let's turn to our agenda.

- Let me say at the outset that I look forward to interesting and productive discussions over the next two days about the state of the world economy and about the work of the Economic Policy Committee.
- A large share of our discussion at this meeting will focus on the economic outlook and policy requirements facing policymakers in the major regions of the world. Since our last meeting, it is heartening to see that, with the exception of Japan, the prospects for strong growth have firmed in much of the OECD area. According to the Secretariat's forecast, most countries in the OECD region are expected to grow strongly enough to eliminate excess capacity. Inflation is low almost everywhere. In some countries, such as the United States, where unemployment is already low and growth continues unabated, we must address the possibility that inflation could rise absent policy intervention. However, our meeting comes at a time of substantial turbulence in global financial markets. And we must face the challenge, over the next two days, of evaluating the economic implications for the OECD countries of the developments in Southeast Asia, and in global financial markets more broadly.
- This meeting also provides an opportunity to revisit issues of perennial concern, in particular the secular tendency in many of our economies, even those that have been growing strongly--toward widening inequality in the distribution of income. We will have the chance to share ideas about how policymakers can most effectively meet the challenge of mitigating the trend toward inequality without compromising growth and efficiency.
- I hope that over the next two days we will also have the chance to discuss with one another and with Mr. Visco, the new head of the Economics Department, and the OECD Secretariat what our priorities should be in the Economic Policy Committee, in our working parties, and in turn in the Economics Division of the OECD. These are particularly critical questions in this time of budgetary stringency.
- Before turning to Mr. Visco for his report on the recent activities of Working Party 3 I would like to make two points concerning participation in this meeting.
 - **First**, interventions will be limited to 5 minutes and enforced by a system of traffic lights. I would, however, like to encourage as many two-handed interventions as possible. If you want to respond directly to what a delegate says or address a question to a delegate, please raise both your hands and the Chair will recognize you to speak for 1 minute. I believe that these interventions are a very useful way of promoting interaction and turning these meetings into more of a

discussion and less of a set of speeches.

- **Second**, I would urge the delegates to avoid describing in too much detail the circumstances in your own particular countries. Instead, the discussions are most useful to the participants if the participants try to generalize from their own experiences to come up with coherent analyses and recommendations.

Report on the recent activities of Working Party 3 (Mr. Visco)

I'd like to now turn to Mr. Visco for a report on the recent activities of WP3.

Report of the Chairman of Working Party on Short Term Economic Prospects (Mr. Potter)

I'd like to welcome Mr. Potter to give us the report of the Working Party on Short Term Economic Prospects.

Policy Requirements in the United States and other Countries with Mature Expansions.

- In this session we will discuss the economic outlook and policy requirements in the United States and several other countries, including the United Kingdom and Canada where growth has been strong enough that the output gap has either completely disappeared or is closing very rapidly. The United States, for example, has enjoyed four successive quarters of growth exceeding 3 percent. This contrasts with estimates of potential output growth that typically lie in the neighborhood of 2.5%. And yet, even with unemployment at or below 5% for over six months--a level below almost all estimates of NAIRU--inflation has thus far not risen.
- Against this background I would like to invite the delegates to focus in their discussions on the key factors influencing the inflationary outlook in the United States and other countries with mature expansions.

Key questions include:

- Have underlying structural relationships determining the inflationary outlook changed? And if so why?
- If the inflation outlook is more favorable going forward are the factors at work transitory or permanent ones?
- Given the uncertainties, how should monetary policy respond to emerging developments? Is a preemptive tightening needed?
- What should be the role of fiscal policy going forward?
- And how do recent developments in equity markets and in exchange rates influence the outlook?

I look forward to hearing the comments of Mr. Rossi of the Italian delegation on these issues. Afterwards, the American delegation will respond and then I will open up the floor to general discussion.

Governor Meyer will lead off in responding to questions concerning the inflation outlook and monetary policy on behalf of the American delegation. Next, I would like to take off my hat as chair and follow up with some comments on the stance of fiscal policy and structural policies in the United States that are designed to enhance the prospects for long term growth.

I would like to give the floor next to delegates from the United Kingdom and Canada to comment on their own economic situations and policy requirements.

The current economic situation and policy requirements in the prospective euro area.

- In our next session we will turn to the economic situation and policy requirements in the prospective euro area. As the Secretariat has noted, the cyclical positions of countries that are likely participants in EMU diverge at the present time, although the gaps are projected to narrow over the next two years.
- Looking forward, the major policy challenge for the countries committed to joining in the first round of EMU, will be how to deal with divergent developments across countries and regions when there is only one single monetary policy available for the euro area as a whole. A key issue, that delegates may therefore want to address, is how differing cyclical needs of participants in the euro area can be addressed on an ongoing basis after EMU.
- Will fiscal policy eventually be available as a tool to address cyclical needs? Given the obligations of countries under the Stability and Growth Pact, how far must fiscal consolidation proceed in order to provide the scope simply to permit the automatic stabilizers to work or, more ambitiously, to allow some flexibility for fiscal policy to be used in an active way to address cyclical needs?
- The absence of monetary policy as a tool to deal with country specific needs also makes improvements in the functioning of labor markets more urgent. The delegates could usefully address the question of whether labor markets are sufficiently flexible to provide effective adjustment mechanisms for the euro area. In this regard, what progress has been made to improve the ability of labor markets to adjust to cushion shocks?
- It is my pleasure to recognize Mr. Okita to lead off the discussion of the economic situation in the prospective euro area followed by Mr. Saurer of Switzerland. Following these presentations, I will recognize the delegates from Germany for comments and response. We will then break for lunch and when we return the floor will be open for general discussion.

Macroeconomic policy requirements in Japan

- In this session, we will focus on the macroeconomic outlook and policy requirements in Japan. The Secretariat's forecast suggests that Japanese growth is unlikely to be rapid enough to reduce the large output gap that currently exists. Domestic demand growth has been sluggish and the projected slowdown in Southeast Asia may also disproportionately affect the Japanese outlook. Against a backdrop characterized by continuing problems afflicting the Japanese financial sector, and with short and long term interest rates at extremely low levels, delegates have been invited to address particularly issues regarding the Japanese fiscal policy.
- What is the likely impact of continuing fiscal consolidation on the chances of recovery? Is there a possible role for fiscal policy, particularly a cut in taxation, in addressing current cyclical weakness in the context of a medium term program of fiscal consolidation?
- In addition it would be useful for delegates to focus on the prospects for the Japanese external sector and the yen in light of the likely negative impact of developments in Southeast Asia on Japan's trade performance. Would a further weakening of the yen be desirable or undesirable? Would further widening of Japan's external surplus create international trade tensions?
- And finally, what are the prospects for the Japanese banking sector? Are the banks acting aggressively enough to write off bad loans and add to capital?

It is my pleasure to recognize Governor Meyer, who will introduce the discussion of this topic. Following his presentation, I will recognize the Japanese delegation for a response and discussion.

Other international issues

We have now had an extensive discussion of the current situation and policy requirements in three of the major areas of the OECD. At this stage, it is useful to focus on the interaction of the policy orientations in the three major OECD regions. By now, it is a cliché that our economies are increasingly interdependent and the choices made in one place have a huge effect elsewhere. Hopefully we can use this next hour to make this cliché somewhat more concrete by addressing the spillovers of policy among the different OECD regions and the impacts of policy changes in some regions on performance in other regions. I would also invite delegates to comment on the likely impact on the economic performance of the major regions of the recent economic turmoil in Asia and in financial markets worldwide. How serious are the likely feedbacks from these difficulties to the OECD economic outlook. How large are the risks? And what if any policy responses are appropriate?

I would like to call upon Mr. Potts of Australia to begin our discussion of this topic.

Report of Mr. Moe, Chairman of WP1

It is my pleasure to next welcome Mr. Moe for his report on the activities of WP-1.

Policy Implications of CPI Bias

Our next topic this morning concerns biases in the CPI, a subject that was discussed during the most recent WP-1 meeting on the basis of country submissions. As most of you know, this is a topic that has recently been of considerable interest in the United States. Indexation of the tax and transfer system in the United States implies that biases in the CPI can have significant ramifications for the government's budget; similar budget effects exist for other countries as well. Countries with widespread wage indexation in the private sector must also be concerned with the possible presence of bias in their price statistics. Finally, accurate price measurement is a precondition for accurate measurement of other economic statistics, including real output and productivity.

I would like to invite Mr. Murray of Canada to lead off the discussion, and then to open the floor to all delegates for a general discussion of the topic. *Some of the issues on which delegates might wish to comment include the following:*

- *Given that rates of inflation are currently very low in many OECD countries, does this make CPI bias of more concern to policymakers?*
- *Do policymakers see CPI bias as problematic in terms of the conduct of monetary and fiscal policy? In terms of wage indexation?*
- *How concerned are policymakers with the possibility that CPI bias spills over into the measurement of other statistics, such as real output?*

Income Distribution and Poverty

In this session, we will consider issues related to income distribution and poverty, particularly in the context of policy responses to income inequality. Following the productivity slowdown in the early 1970s, income inequality and poverty began to rise in many OECD countries; this trend has been a major concern of policymakers. More recently, the dictates of fiscal consolidation and general perception that antipoverty and income redistribution programs have had only limited success in attaining their goals in a cost-effective manner have led many countries to rethink how they assist their neediest citizens.

The Secretariat's paper documents trends in inequality and poverty across a number of OECD countries, and discusses a number of issues related to how governments have responded to these trends. I would invite delegates to pay especial attention to the latter topic, with a focus on the lessons they have learned from their own countries' experiences. In particular, delegates might wish to address the following questions:

- How can governments mitigate the economic disincentives associated with tax-transfer programs? Are transfers targetted on the basis of nonincome criteria a reasonable solution? What sorts of problems might nonincome transfers face?
- What is the scope for proactive policies, such as training and education programs, in mitigating income inequality?
- Can wage subsidies improve the position of low-wage workers? Does the type of subsidy--that is, employer-based *versus* employee-based--make a difference?
- What place, if any, does a statutory minimum wage have in an antipoverty program?

I would like to invite Mr. Delbecque of Belgium to open up our discussion concerning income distribution and poverty. Following the introduction, we will have a general discussion of the topic.

EPC Meeting - Comments on the U.S. Economic Situation

I would like to follow up Governor Meyer's discussion of the current economic situation and policy requirements with some comments on the prospects for growth over the medium to longer term.

Let me begin by emphasizing that, from the perspective of growth, the current "high-pressure", low unemployment environment in the United States is likely to yield some dividends, assuming that it can be maintained without an increase in inflation. A tight labor market is encouraging participation by those who might otherwise sit on the sidelines, and is making it easier to absorb less-productive workers--such as those who are less-skilled, or younger workers--into the workforce. It is also motivating firms to invest in workers in order to develop the skills that they find in short supply. The consequence is that labor-market entrants are receiving much-needed on the job training, and a chance to acquire the skills required in order to hold down a job successfully in the future. Tight labor markets are also improving workers' prospects for upward mobility, by giving them the ability to "trade up" by moving to a different job for which they are better suited. One concrete benefit we have seen is that the unemployment rate among African-Americans, which has historically stayed stuck at double-digit levels, has been hovering near its lowest level in over two decades. The tight labor market is also helping to make welfare reform work. Since August 1996, when the welfare legislation was signed, the number of recipients has fallen by nearly 2 million (from 12.2 to 10.5 million). , This decline is even larger--3.6 million--since January 1993. Indirect evidence suggests that a significant fraction, although not all, of this caseload decline can be traced to the economy's strength. It seems plausible that short-term economic conditions can affect

long-term structural unemployment, and although the idea that the natural rate of unemployment can increase as the result of a recession is typically invoked to explain labor-market conditions in European countries, the same phenomenon might well exist in reverse in the United States, albeit perhaps in a less widespread and more hidden form.

Next let me turn to the issue of productivity growth. As the Secretariat mentions in its analysis, some analysts have advanced the so called "New Age" hypothesis--that the American economy's potential rate of growth has increased. Although there are some recent hopeful signs on the productivity front, the Council of Economic Advisers has resisted incorporating into Administration budgetary forecasts an assumption of faster productivity growth until it is more firmly established in the data. However, Administration policies do remain squarely focused on raising productivity growth through tried and true methods: through investments in physical and human capital, in R&D, in infrastructure, and through policies to open markets and increase competition both domestically and through international trade.

A notable feature of the current expansion, unlike the situation that prevailed during the 1980s, is that private--not public--demand has been the motive force driving the economy's growth: in particular, real business investment has soared over the past four years, growing at an average rate of nine percent per year. I believe that a significant share of the credit for this achievement rests with the government's pursuit of a more responsible fiscal policy together with the stronger economic performance to which it contributed. The past four years have seen the Federal government make great strides toward finally bringing its budget into balance. Since 1992, the budget deficit has been cut from its record level of \$290 billion to \$22.6 billion in 1997. This means that the deficit has fallen from 4.7 percent of GDP to only 0.3 percent--the

lowest the deficit has been since 1974. The recently concluded budget agreement will finish the job we set out to do over four years ago. According to our projections, the budget will move into surplus in 2002. This will be the first balanced budget since 1969, and only the ninth since World War Two.

Fiscal consolidation has promoted growth by freeing up private savings to flow into capital investment. This investment has expanded capacity sufficiently, I believe, to have dampened inflation even during the current expansion. More important, it is laying a foundation for more rapid long-run growth. But, in pursuing fiscal consolidation, the Administration has been careful to ensure that it has not merely encouraged private investment at the expense of public investment, particularly in education and human capital. For that reason, our recently concluded budget agreement contains expanded spending and tax initiatives for education and training (many of which are extended to *workers* in recognition of the fact that learning and training must be lifelong activities in a contemporary industrial economy).

An important priority for future budget policy will be to address the long-run issue of entitlement reform, namely reform to our old-age pension and government-run medical insurance systems. I believe that these problems, particularly the reform of our Social Security system, are far from insurmountable, and we are currently making important progress toward identifying our options. But the time is coming when we will have to make choices as well.

In addition to fiscal consolidation, the U.S. government has continued to pursue two additional initiatives aimed at placing future economic growth on a firmer footing. The first has been in the area of regulatory reform, which has most recently involved the areas of telecommunications, electricity, and financial markets (mainly banking). Regulation is one of

the most intrusive forms of government activity, and the current administration has attempted to ensure that the necessary regulatory duties of government are pursued in a manner that has the smallest adverse effect on economic efficiency. In practice, this involves: first, constructing regulatory initiatives that complement--rather than oppose--the market; second, recognizing the effects of government regulation on economic incentives; and third, making the regulatory process responsive to innovation, which is imperative in industries where technological change is rapid.

In addition to opening domestic markets through regulatory reform, the present administration has also acted to open up markets abroad through the aggressive pursuit of freer international trade. Free trade encourages economic efficiency (thus raising the *level* of output) and may even encourage innovation (thus affecting economic *growth*). At present, a major Administration initiative in the area of free trade involves the renewal of its "fast track" authority for negotiating trade agreements; this will be used both to expand existing trade agreements as well as to negotiate new agreements in such areas as government procurement and information technology.

Question on Policy in the EMU area

I would like to ask two questions related to policy developments in the prospective Euro area.

The first is quite specific, and pertains to the recent increase in the repurchase rate by the Bundesbank. My question is whether this rate increase was seen as warranted by the current German economic situation, that is, whether the increase represents a “preemptive strike” against incipient price acceleration, or, rather, if this step was taken with EMU in mind. And, how will the twin policy considerations of domestic stabilization and EMU convergence be balanced going forward?

My second question is more general, and relates to the pace of structural reform in prospective EMU countries. For the United States, which has a relatively high degree of labor market flexibility, evidence indicates that negative demand shocks do not induce wage adjustments that are large enough to counter adverse employment effects. Since labor market rigidities are arguably more significant in many European countries, one might reasonably expect that the adjustment process to a demand shock would be even more painful. Because EMU will constrain the role that monetary and/or fiscal policy will be able to play in cushioning shocks, this would seem to suggest that the pursuit of policies that promote labor market flexibility is essential for prospective EMU countries.

I would therefore like to ask whether the pace of structural reform in EMU countries is proceeding at a sufficiently rapid pace, and in a sufficiently balanced manner. I would also like to enquire as to whether workweek-reduction policies such as those that have been advanced in two prospective EMU countries can reasonably be seen as contributing to labor market flexibility, or if the motivation behind these policies is unrelated to the goal of long-run structural reform.

Steven Braun

Remarks on the CPI for use at the EPC Meeting (11-6-97)

The U.S. Experience

The U.S. has been through a three-year period in which the accuracy of the CPI and its links to the government budget have received intense scrutiny. As a consequence, many more Americans have become aware (if they weren't already) that

- 1) the CPI is not a true cost-of-living index,
- 2) that there is a plausible case that the CPI overstates increases in the cost of living;
- 3) that the upward bias in the CPI may have large and significant budget consequences because our tax, government pension, and social security systems are indexed to the CPI. If the CPI were biased upwards by one percent per year, then this bias would cost the Federal budget almost \$700 billion dollars over the next ten years.

- (4) And the existence of a bias means that we are constantly underrating both the pace of real economic growth and the magnitude of real wage gains.

On the surface, pricing a fixed market basket, is a simple and transparent concept. But one thing that we have learned from the American experience is that the CPI is neither as simple nor as transparent as it appears.

For example, what happens when a surveyor from the statistical agency looks for a

designated product on the shelf and finds that it has gone? This is a very common experience that, each year affects almost half of the 70,000 items quoted in our CPI. If a new product is selected, what should the agency do with the difference in price between the new and the old product? It turns out that the possible responses to this problem are largely responsible for the so-called “quality bias” or lack of it. And it is a subject about which much has been written, and to which much research is now being directed.

A second example of the complexity of the CPI is the recent discovery and correction by our statistical agency of a bias in linking the new stores rotating into the sample. The problem was so obscure and esoteric that it was invisible--until it was discovered by a few dedicated civil servants at our statistical agency.

A third example of complexity is the quality adjustment of medical care. We have had a system that largely measures the price of medical inputs--such as an hour of a physicians’ time, an overnight stay in the hospital, and so on... Although it is obvious that a system based on medical outcomes would be more consistent with a cost-of-living index, we have thus far taken only small steps in this direction.

Results of OECD Survey: What have we learned?

Against this background, it was useful for the Secretariat to design, distribute, and summarize a survey of OECD countries--so that we could learn from each other’s experiences.

There seems to be general agreement that more use of geometric aggregation would alleviate substitution bias at the lower level. The U.S. will implement more of this in 1999, and the fact that Canada and Sweden have already done so, will make it easier for us.

Many countries report uncertainties in the measurement of housing costs--especially that of owner-occupied housing. Although the Secretariat's paper stops short of saying this, more use of rental-equivalence formulas would be helpful.

One curious conclusion of the Secretariat is that the statistical agencies of member countries seem to be more comfortable with the current construction of the CPI than the economists who use it. Perhaps this tension is reason enough to pursue the issue further.

On reading the paper prepared for WPI, we were surprised to find that many countries minimized potential problems with substitution bias because their basket was updated frequently-- and dismissed problems with outlet-substitution bias because new stores were included on a regular basis. Although these efforts help, they do not suffice. The only complete fix for substitution bias would use information from the current-year market basket--as in the so-called superlative indexes. Similarly, outlet substitution might still be a problem unless the lower prices at the new outlets at the time they are introduced are directly linked to the old product. In contrast, in the U.S., the entire price differential is assumed to reflect quality of service (which may or may not be true).

Policy Implications

As for policy implications, almost everyone agrees that a CPI bias is of little import for monetary policy--so long as it is both known and stable over time. But the same line of reasoning requires that CPI biases ought to be evaluated--if they have not been already.

As for fiscal policy, a bias in the CPI has large and obvious connections with the budgets of those countries that index their tax, pension, and social security systems. According to the Secretariat's survey, fifteen OECD countries report some indexation. But even in countries where indexation of the tax and benefit system is not automatic--but rather determined by the legislature--I would guess that recent inflation is considered an important factor in the legislative outcome. As a result, the possibility that fiscal effects may result from a biased CPI cannot be dismissed out of hand.

[this paragraph is not important] Because the CPI is used in all of our National Accounts, a CPI bias would work its way into productivity statistics. Thus we should be mindful of the possibility that the post-1973 productivity slowdown could be an artifact of the CPI bias. However, I am not aware of any research which suggests that any biases in the CPI are any worse now than they were before 1973, and the possibility that the productiivty slowdown in a statistical artifact is remote.

Perhaps the most interesting policy question is whether a CPI bias has implications for wage-setting behavior. The recent behavior of prices is certainly an important consideration in

any wage negotiation. It is worth some thought whether a biased CPI could be a cause of real wage rigidity--especially as elevated levels of unemployment linger in many OECD countries.

Statement on Income Distribution

The Secretariat's paper raises a number of interesting and important questions; but it is, unfortunately, impossible to do full justice to them within the time allotted for a statement. I would therefore like to focus my remarks on several issues that have been foremost in U.S. policymakers' minds during their most recent attempt at welfare reform.

A typical cash assistance program guarantees a given amount of money to those who receive no income, and then phases out this benefit as income--that is, labor income--rises. Such a program discourages work, and these work disincentives have been a major concern--perhaps *the* major concern--of U.S. policymakers. Today, policymakers have concluded that there is really no way to correct these disincentives *so long as we confine ourselves to considering policies that are similar to the cash assistance program just outlined*. We therefore have to broaden the menu of policies that are up for consideration.

One way to avoid the work disincentive effects of the canonical cash assistance program involves closely tying benefits to a work requirement. In particular, one can either mandate a work requirement directly, or else structure programs so as to provide strong incentives for work. For example, a welfare program might directly require a potential recipient to work for a given number of hours per week, or it might make eligibility for certain benefits conditional on employment. Experimental versions of these programs are presently being pursued at the regional level in the United States.

This kind of policy has its own problems, however. In particular, it makes no real allowance for those who *cannot* work. In addition, if it is to be successful such a program requires a large administrative infrastructure in order to provide for extensive

employment-support services and supervision of participants. While this raises program costs, it does permit the welfare authority to obtain a better idea as to whether a person cannot find a private-sector job, in which case other provisions can be made (such as public-sector employment or a disability pension).

A second way to mitigate the disincentive effects of a standard cash assistance program involves constructing a program that subsidizes the wages of low-income workers. This type of program has recently been expanded as part of the U.S. government's current welfare reform initiative, and is known as an "earned income tax credit," or EITC. Under the EITC, low-wage workers with children receive a credit against their earned-income tax liability; this credit is rebated in cash if the worker's tax liability is zero.

An EITC-style program is quite different from a typical cash assistance program in that benefits are zero under the EITC for those who do not work and rise as earnings increase (up to some threshold earnings level). The EITC therefore largely eliminates the disincentive effects that face low-wage workers in the standard cash assistance program.

This program represents a wage subsidy that is paid out to employees. In general, such a subsidy is probably superior to one that is paid to *employers* if income assistance is the subsidy's primary goal. First, it is easier to target *family* income with an employee-based subsidy, since an employer-based subsidy is received by *all* low-wage workers, including those (such as secondary earners or teenagers) who might not be members of a needy family. Second, a wage subsidy paid to employers is probably more likely to result in wage reduction, while a subsidy paid to employees is less likely to do so, as it is largely hidden from employers. (Such wage reduction makes an employer-based wage subsidy a less attractive policy from an income assistance

standpoint.)

I would note that the minimum wage complements and interacts with an EITC-style program in an important way. Using the minimum wage by itself in order to guarantee a subsistence level of income is problematic in that it requires the minimum wage to be very high, which discourages employment. On the other hand, using the EITC alone in order to guarantee an income floor requires payment of a large subsidy that must then be phased out slowly in order to minimize disincentive effects. This makes the program much more costly. Hence, the minimum wage and the EITC must be employed jointly in designing an optimal assistance package.

The Secretariat's paper discusses a separate class of policies that involves transfers that are targetted according to nonincome criteria. I would conclude by adding to the comments made by the Secretariat's paper with a couple of comments of my own. First, a basic problem with this type of policy is that very few nonincome criteria can be targetted in a nonproblematic manner. Consider, for example, a policy that provides income support to single-parent families with children. In the United States, this sort of program would be (and has been) criticized on the grounds that it can adversely affect family formation by encouraging the creation of single-parent households. It can even be difficult in practice to target criteria that are in principle free of an incentive problem--witness the high rates of disability that are reported in countries with generous disability pensions. That said, the potential does exist in the U.S. for narrow targetting of transfers that could likely have a high impact with only limited cost. For example, targetting children who live in inner-city areas might represent a beneficial and relatively inexpensive antipoverty program. However, these sorts of policies do raise important

equity issues; for example, why should a child in an inner city enjoy assistance as opposed to a child in a rural area if both are poor? It is also unclear whether a similar potential exists for narrowly targetted transfers in other OECD countries.

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CREATOR: Randall W. Lutter (CN=Randall W. Lutter/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME:12-MAR-1998 14:35:21.00

SUBJECT: Utility restructuring

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TO: Janet L. Yellen (CN=Janet L. Yellen/OU=CEA/O=EOP @ EOP [CEA])
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TEXT:

----- Forwarded by Randall W. Lutter/CEA/EOP on 03/12/98
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Richard P. Theroux
03/12/98 09:53:08 AM
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To: Richard B. Belzer/OMB/EOP, Randall W. Lutter/CEA/EOP, Eric M.
Haxthausen/OMB/EOP, Erik K. Godwin/OMB/EOP
cc:
Subject: Utility restructuring

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No. 48
Thursday March 12, 1998
Regulation, Law & Economics

Energy
EPA May Seek More Authority for Trading
Through Utility Restructuring Legislation
The Environmental Protection Agency is seeking more authority to establish
federal emissions trading programs through electric utility restructuring
legislation, partly to ensure that the United States is capable of meeting
commitments to reduce greenhouse gasses under the Kyoto Protocol,
according to internal agency documents.
The two documents, made available to BNA March 11, outline a plan that
would enhance EPA's ability to set up cap-and-trade emission trading
programs for emissions of a handful of pollutants the agency expects to
increase as utility restructuring efforts move forward. While EPA
maintains it has authority to regulate the pollutants, including carbon

dioxide, under the Clean Air Act, the documents said the agency believes it lacks authority to establish national trading programs for any pollutant other than sulfur dioxide. Some members of Congress also maintain the agency lacks authority to regulate CO₂.

"In short, what is needed is smarter, not more extensive, authority--enhanced authority as to how EPA may control these pollutants in order to achieve the necessary reductions at the lowest cost and with the most private sector flexibility," one memorandum said. It listed the four major pollutants of concern as nitrogen oxides, sulfur dioxide, carbon dioxide, and mercury.

The memo also stated that the agency believes establishing this additional authority is integral to implementing U.S. commitments for cutting greenhouse gasses that were agreed to in the Kyoto Protocol. It said power plant emissions of carbon dioxide are expected to increase by 62 million metric tons by 2010 as a result of restructuring, while emissions of NO_x are expected to climb by 553,000 tons.

"Their emissions must be reduced in order to fulfill the Administration's commitment to clean air and to meet our greenhouse gas emissions budget under the Kyoto Protocol," the memo said.

Kyoto Backlash

The documents, along with other "indicia" that the administration is attempting to implement its commitment under the Kyoto Protocol without Senate ratification, has created a firestorm among congressional opponents of the treaty. An aide to Rep. David McIntosh (R-Ind), who is investigating the matter, said the documents are "one more piece of evidence that EPA is zooming ahead" with implementing Kyoto commitments. Under the protocol, U.S. negotiators agreed to cut the nation's emissions of six greenhouse gases by 7 percent below 1990 levels over the period of 2008-2012.

But EPA Administrator Carol Browner told House appropriators March 11 that the memos represent proper internal agency discourse on the matter.

"There has been no decision based on those memos. I make the decisions," Browner told Rep. Thomas DeLay (R-Texas), a member of the House appropriations subcommittee overseeing EPA funding.

DeLay said, however, he was concerned that the memos represent an EPA attempt to implement the Kyoto Protocol.

"They make the case they're implementing the Kyoto Protocol before ratification," DeLay told Browner.

"They're raising the question," Browner responded. "This [memo] is people's thoughts on how something might be occurring. In no way is this deemed a management decision."

Later, DeLay posed the question differently. "Is it EPA's position that electricity restructuring legislation should contain provisions to place caps on CO₂ emissions and domestic emissions trading before the Senate ratifies the Kyoto Protocol?"

Browner responded that the administration's principles or proposed legislation are still being developed, and that no decisions have been made. She said that, even before Kyoto, President Clinton was committed to using all of the tools available to the administration to reverse global warming. She said those tools include economic market incentives, and she pointed to the success of the acid rain program as an example.

"Whether the electricity restructuring is the proper place [to implement

economic market incentives] is an open question," Browner said. She emphasized that there is nothing in EPA's budget request on emission caps and trading. "It is not something we can require the utility industry to do," Browner told DeLay.

Authority to Regulate CO2

However, Browner implied at the appropriations hearing that the agency does have the authority under the Clean Air Act to control CO2 emissions from utilities, a position that has been questioned by some members of Congress.

One EPA memo specifically states that the agency has the authority under the Clean Air Act to establish pollution control requirements for four major air pollutants emitted from power plants -- NOx, SO2, CO2, and mercury.

EPA currently regulates three of the pollutants, but not CO2.

DeLay questioned whether the Clean Air Act intended to treat CO2 as a pollutant. He asked Browner if she agrees with the memo that EPA has authority to control CO2 emissions, as well as the other three pollutants.

"I agree that broad authority is granted to EPA to control such pollutants," Browner replied.

She deflected more questioning on the CO2 issue by calling attention to another major point in the documents that states the Clean Air Act does not provide EPA the authority to regulate pollutants using market mechanisms.

"The Clean Air Act does not provide these common sense, cost-effective solutions," she said.

'Integrated' Strategy

In the two documents, EPA called for an "integrated environmental and economic strategy" for implementing electric utility restructuring.

The document outlined five reasons for such an approach, with the first being that "electric restructuring probably will lead to increases in these emissions, not reductions, unless it is accompanied by appropriate market-based pollution limits." The agency added that incorporating environmental provisions into restructuring legislation also will lead to "large economic savings" by giving power plants advanced notice of their future regulatory obligations.

Uncertainty over pollution requirements already is affecting investment decisions in this industry, one of the agency memos stated. "Allowing this uncertainty to linger will impose a substantial economic drag on the restructuring process," it stated.

Perhaps the most important reason to integrate environmental provisions into an administration proposal for restructuring legislation, however, is to aid EPA in establishing cap-and-trade emissions trading programs for a wider array of air pollutants.

Under this approach, the agency would set a nationwide cap on emissions of a particular pollutant and allocate emissions to sources in the form of allowances. Under the agency's existing SO2 cap and trade program, sources can emit one ton of the pollutant for each allowance they hold. If they reduce their emissions beyond their allocation, however, plants can sell excess allowances or bank them for use in later years.

Under the current statutory scheme, EPA only has authority to set up a

nationwide cap-and-trade system for SO₂, the memo said. It can recommend that states establish their own programs, but lacks authority to force them to do so.

"A single, federal cap-and-trade program would be much easier to establish and much more certain to deliver economic benefits of market-based approaches," the memo said.

The memo added that electric utility restructuring has developed into a key environmental issue this year.

"Including market-based provisions for these pollutants in the Administration's restructuring proposal would draw strong support from important constituencies," the memo added. "It would be seen as a concrete step to move forward domestically on global warming while continuing to work for progress internationally in follow-up to Kyoto."

By Alec Zacaroli and Amy Porter

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