

# Withdrawal/Redaction Sheet

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| 001. email               | Michele Jolin to Jeffrey A Frankel, Rebecca M. Blank, and Janet L. Yellen at 18:33:10.00. Subject: Recruiting. (1 page) | 02/27/1998 | b(6)        |

### COLLECTION:

Clinton Presidential Records  
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### FOLDER TITLE:

[02/23/1998 - 02/27/1998]

2013-0723-F  
ab1275

### RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

Freedom of Information Act - [5 U.S.C. 552(b)]

P1 National Security Classified Information [(a)(1) of the PRA]  
P2 Relating to the appointment to Federal office [(a)(2) of the PRA]  
P3 Release would violate a Federal statute [(a)(3) of the PRA]  
P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]  
P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]  
P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).

RR. Document will be reviewed upon request.

b(1) National security classified information [(b)(1) of the FOIA]  
b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]  
b(3) Release would violate a Federal statute [(b)(3) of the FOIA]  
b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]  
b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]  
b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]  
b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]  
b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:23-FEB-1998 09:27:32.00

SUBJECT: Economic analysis proposal

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:

----- Forwarded by Michele Jolin/CEA/EOP on 02/23/98  
09:27 AM -----

Peter R. Orszag

02/22/98 04:43:52 PM

Record Type: Record

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

cc:

Subject: Economic analysis proposal

Draft attached. What do you think?

Message Sent

To:

Michele Jolin/CEA/EOP

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

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D22]MAIL43757735N.026 to ASCII,  
The following is a HEX DUMP:

## Possible Climate Change Economic Analysis Binder

The following relies primarily on existing papers, and thus could likely be put together in a matter of days. Note that if all the tabs were included, it would total over 200 pages.

| <u>Tab</u> | <u>Description</u> |
|------------|--------------------|
|------------|--------------------|

- |    |                                                                                                                                                                                       |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | Janet Yellen's testimony (40 pages double-spaced)                                                                                                                                     |
| 2. | Graphs (10 pages)                                                                                                                                                                     |
| 3. | Economists' Statement on Climate Change (15 pages, with signatures)                                                                                                                   |
| 4. | Discussions of climate change from ERP 1997 and 1998 (15 pages)                                                                                                                       |
| 5. | Summary Chapter and Chapter 3 from Cline, <i>The Economics of Global Warming</i> (pages 3-10, and 81-138)                                                                             |
| 6. | Paper from Treasury on the opportunities for low-cost reductions abroad (building on Jon Gruber's memo to Larry Summers, perhaps 10 pages)                                            |
| 7. | Paper on cost reductions from domestic and international trading (Mazur and others, perhaps 10 pages) or paper on SO2 example (from published outside source, e.g. Stavins's paper)   |
| 8. | Duncan Austin, "Climate Protection Policies: Can We Afford to Delay?" World Resources Institute (37 pages)                                                                            |
| 9. | KJ Arrow, WR Cline, KG Maler, M Munasinghe, R Squitieri, and JE Stiglitz, "Intertemporal Equity, Discounting, and Economic Efficiency," in <i>Climate Change 1995</i> (pages 130-144) |

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:23-FEB-1998 11:58:27.00

SUBJECT: Q&A

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

TEXT:

Attached is some very rough Q&A/notes I have been working on. ===== ATTACHMENT 1  
=====

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D14]MAIL40955045K.026 to ASCII,  
The following is a HEX DUMP:

## **Questions and Answers Re Climate Change Testimony**

[Need reading statement.]

[Need analysis of agricultural impact.]

[Need charts]

[Need economic report.]

### **ACCOMPLISHMENTS IN KYOTO/THE AGREEMENT**

Didn't you just cave in Kyoto?

Kyoto was a great success. The U.S. got:

- 3% emissions reductions below POTUS proposal
- six gases
- sinks
- JI (Clean Development Mechanism)
- multi year objective--our desired period
- International Emissions Trading among Annex B
- full flexibility on domestic policies and measures

But we still have work to do:

- need to define rules and procedures for market-based international emissions trading and JI.
- a framework to insure meaningful participation from key developing countries. The CDM is a down payment on participation but more needs to be done.

Why did we agree to differentiation?

You said that the Kyoto treaty involves a 3% cutback in GHG emissions for the U.S. while the treaty says that the U.S. has agreed to a 7% cutback. Which is it?

If we compare what we agreed to in Kyoto with the President's original proposal, we have agreed to a 3% cutback over and above what POTUS proposed. POTUS proposed that the United States lower its net emissions of greenhouse gases--defined as gross emissions less removals due to sequestration in forests--to 1990 levels. In 1990, our net emissions were 1539 MMTC. We agreed in Kyoto to lower our net emissions to 1484 MMTC, which is three percent below our 1990 net emissions. The Protocol language, in contrast, says that the United States commits to lower its net emissions to 93% of our gross emissions of GHGs in 1990. That's where the 7% cut comes in. Carbon sequestration in sinks counts in meeting that target. 93% of our gross emissions in 1990 is the same as

97% of our net emissions in 1990.

Why did the Administration agree to cut emissions by as much as 7% below the original target?

We calculate that the agreement calls is only slightly (not 7%) more stringent than the President's initial proposal. The Baseline is 1990 for CO<sub>2</sub>, methane and N<sub>2</sub>O and 1990 or 1995 for the other three gases. Sinks are also included in this proposal. We calculate that we will be required to cut emissions to 1484 million metric tons of carbon equivalent per year in 2008-2012.

### **ECONOMICS/COST TO U.S.**

How large is the U.S. cut relative to projected total BAU emissions in 2008-2012?

The U.S. cut is about [28%] relative to the EIA's forecast of BAU emissions in 2010.

Why are you telling me that the impact on the U.S. is so small whereas the EPI and others find a huge impact?

EPI, WEFA and other studies ignore many things we think are critical to mitigating the impact--particularly international trading and the CDM, but also six gases, sinks, electricity restructuring, the Climate Change Technology Initiative and industry partnerships.

Do your simulations assume cutbacks by the developing countries? Shouldn't they have to cut back like we do?

We have assumed that developing countries included in the agreement would not be expected to cut back emissions at this time. Our simulations provide them with permits equal to their likely baseline emissions. Even so, they will choose to cutback because it is in their interest to do so. They have the opportunity of earning income whenever they can cut emissions at less than the going permit price--and there are lots of opportunities for them because they are so energy inefficient. Their inclusion in a trading regime, even if they are not required to do anything, is a win-win situation. It's a win for us because we can abate CO<sub>2</sub> at low cost and put them on a much better energy path than the one we travelled along when we industrialized. It's a win for American businesses because they have a chance to develop industries that will cut emissions around the world. It's a win for them because they earn income and help improve the global environment as well as their own. The important thing about emissions trading and JI is that these schemes create the right incentives to economize on greenhouse gas emissions everywhere they are in place--even in countries that are not required to cut their own emissions. That's

critical it fostering energy efficient investments and in avoiding concerns about competitiveness. Even if a LDC isn't expected to cut back its own emissions, it will have the incentive to avoid attracting industries that produce GHGs, because higher emissions of GHGs by industries that are energy intensive will use up that country's emissions rights and result in revenue losses to a country or its firms that could otherwise have sold unused permits.

As we go forward, we will have to decide what is meant by meaningful participation, but identical targets for developing countries and developed ones would not seem fair given our higher income, and much higher per capita production of greenhouse gases.

If developing countries don't cut emissions won't that damage U.S. competitiveness and cause energy intensive industries to flea?

- The inclusion of key developing countries in a trading scheme, even if they are not required to cut back their own emissions, mitigates the concern about competitiveness. This is true because for any country in that scheme, it is costly to emit carbon--costly for the LDCs in the sense that they are foregoing the chance to earn extra income by conserving carbon emissions. Any member of the trading scheme will want to insure that industries operating in their borders use energy efficiently, because if they use it inefficiently, they impose a revenue loss either on themselves or on the government, that could gain from selling permits.
- We do not, in an event, expect a substantial impact on energy prices. Remember that, on average, energy accounts for only 2.2% of total costs to U.S. industry.
- We shouldn't exaggerate the impact of energy prices on location decisions. Today, energy prices already differ significantly around the world. For example, in 1996, premium gas cost \$1.28 in the U.S., \$0.08 in Venezuela, \$3.71 in Switzerland and \$4.41 in France. Yet U.S. industry is not moving en masse to Venezuela nor is European industry fleeing to the U.S. Similarly, with respect to wages; a good share of our imports come from countries with higher wages than ours and over half of our foreign direct investment is in countries with comparable or higher wages. The impact of variable cost factors on location decisions is easily exaggerated.
- We have a sector that is already highly competitive and will become more so as a consequence of this agreement--the energy efficiency/alternative energy sector. As countries expand their own domestic climate change action plans, significant export opportunities will open up for U.S. manufacturers in these fields.

You agree that energy prices will rise. Isn't that just a tax?

The President has not proposed a tax increase. Quite the contrary, he has proposed tax cuts to stimulate energy efficiency and to jumpstart technologies that can provide lead to big cutbacks in energy use. He has also proposed voluntary emissions reductions, working with industry. And he will propose energy restructuring that will lower energy prices for all households. There will be periodic reviews to see how effective these initiatives are. Only in 2008, has the President proposed an emissions trading system that would determine a market-determined price, not a tax, on carbon emissions.

- We expect gas prices, under the conditions I have specified to rise less than \$.05. You have to put this in perspective. An increase of this amount is less than the normal year to year or seasonal variation in gas prices. On average, gas prices have changed since 1983 by about 8 cents per year in absolute terms--equivalent to a \$31/ton price of carbon.

What will happen to the coal industry in the United States under your scenario?

Even in the absence of any policy it is projected that natural gas will account for a growing proportion of electricity generation. In 1990, coal accounted for 53% of total generation. By 2020, the share of coal is projected to decline to about 44%. This is due to the use of highly efficient and low-cost natural gas combined cycle power plants, which makes natural gas the choice fuel for electricity generation. Substitution away from coal in electricity generation toward natural gas and renewables is an important source of conservation in the U.S., along with increased energy efficiency.

Could nuclear have a role?

Well what would the cost to households and the impact of permit prices be in the United States if none of this trading works out at all?

In a recent paper, the SGM modellers report that in four scenarios they consider, including one that involves a 10% cut off 1990 levels, the economic cost to the U.S. remains below 1% of GDP through at least the year 2020 even in scenarios where the United States meets its mitigation targets without international trading of carbon permits. However, the price of carbon permits would rise, in most models, substantially more than I've estimated. For example, the Five Labs study, which is at the optimistic end of models, envisions a \$50/ton carbon price to reduce emissions to 1990 by 2010. [In the SGM simulations, the Kyoto protocol results in a domestic emissions price of \$171.]

How have you measured cost? What is that?

Cost refers to the direct additional resource cost required to to reduce emissions. It is the approximate sum of the marginal cost of abatement over all abatement units. The first

units of emissions reductions are quite inexpensive; successive units become more and more expensive. These costs include transfers abroad. These do not include any costs of establishing a domestic or international permit trading system or any transactions costs associated with permit trading among firms or regions. The cost is estimated as  $1/2 \times \text{permit price} \times \text{required abatement}$  ( $600 = 2040 \text{ BAU emissions} - 1440 \text{ mmtc}$ )

Aren't the costs you estimate very sensitive to assumed growth rates in the U.S., the world and other features of the Baseline?

Yes, the cost estimates do depend on assumed growth rates worldwide and other features of the baseline. In particular, faster population growth or economic growth could raise the cost.

The assumptions for the U.S. come from the Annual Energy Outlook (97/98?). It is assumed that the U.S. grows at an  $x\%$  real rate and population grows at  $0.85\%$  per year. On average, energy consumption is projected to rise at  $1.1\%$  per annum. In the SGM baseline, E/GDP falls at  $1.0\%$  per year.

Assumptions for other regions come from the World Energy Outlook 1996. For Eastern Europe and the FSU regions, projected energy consumption was adjusted downward. Population projections were based on World Population Projections 1994-95 of the World Bank. U.S. population and crude oil prices were taken from AEO97.

How much emissions reductions occur in the U.S.?

It is hard to offer a definitive answer to that question. It depends, in particular, on some of the things that are hardest to quantify, such as the impact of our climate change initiatives. I believe that as we tackle the issue of climate change, it is a moral imperative for the United States to take its own obligations seriously. The challenge facing the Administration and the environmental community is to translate this imperative into meaningful action here at home. This means increased attention to energy conservation here and improved diffusion of all of the energy conserving opportunities that already exist that we know can reduce emissions and save money at the same time. We are committed to promoting these win win ideas and that's what the climate change initiative is about. Industry has told us that they see large opportunities to conserve GHGs and we propose to work with them to effect these changes. The Federal government has opportunities to improve its own performance. The more effective these initiatives are, the more mitigation we will end up doing in the United States. On top of that, we have the chance to meet part of our obligation by planting trees--which would entail more domestic action. We also expect electricity restructuring to make a contribution to reducing emissions. I have pointed to the importance of international arrangements, however, and I expect them to be used in meeting our obligation. It is the fact that there exist demonstrable opportunities for efficiency improvements at low cost in so many countries around the world that gives me the

confidence to predict that the costs of the agreement will be modest if we obtain strong trading agreements. That does not mean that we will not do our part here at home.

But in the SGM model simulations you reported, how much is done abroad?

In the simulations, 75-80% of the abatement is done abroad, but for the reasons I have given you--sinks, climate change initiatives, electricity restructuring, improved diffusion of existing initiatives--I do not think these simulations provide a good estimate of the U.S. share. I have always said that any single model and even many models alone provide a sound basis for judgement. These models should inform our thinking, and they have, but they are not a substitute for good judgement.

How can you argue that there will be no job loss?

In the United States, we rely on market mechanisms and sound monetary and fiscal policy to keep unemployment low and jobs abundant, as they are right now. Opportunities across firms and across sectors are shifting all of the time--for many reasons, whether its mergers and consolidation in banking, health care or telecom or market opening agreements that create opportunities in export industries while shifting them away from import-competing industries. In fact, research shows that in a typical year, about 10% of all jobs in the U.S. economy are destroyed, but a slightly larger proportion are created. Adjustment is a fact of life that American workers have to adapt to and the role of government is to give workers the tools to make those shifts and to insure that help is there when adjustments are difficult. In this context, and especially in light of the fact that we predict a very small impact on energy prices in the U.S., I see no reason to assume that significant structural adjustments will be needed to accomodate the Kyoto protocol emissions cuts. Nor would I expect price changes that are so modest in size to significantly impact inflation or unemployment. The industry that is likely to be most severely affected by the agreement is the coal industry, because domestic emissions reductions are likely to disproportionately affect coal.

Job loss estimates usually come from short term macro models like the DRI model that are not appropriate for predictions of long term changes. In the EPI study, the model was run with assumptions giving a worst case result--a \$200 permit price, increased emissions baseline and no trading. Trade effects were important, which probably reflects weak modelling.

What about revenue recycling?

The SGM runs we have reported assume that any revenue that could be obtained from auctioning permits are redistributed back to the economy through a lump-sum transfer. There are potential efficiency gains that would lower costs if the permits are auctioned and any revenues use for cutting taxes that impede work and saving. On the other hand,

the permits can be allocated in ways that generate no revenue whatever. This is what was done in the SO2 case.

You emphasized all of the uncertainties in estimating the costs of Kyoto. In light of those uncertainties, doesn't it make sense to wait to tackle climate change?

There are real uncertainties about the costs; but we feel, based on a wide range of economic analysis, that they are likely to be modest if we are successful in obtaining a strong treaty, everything considered.

And we have purposely constructed a process that builds in the uncertainty with period reviews. We do not plan to implement an emissions trading mechanism for a decade and we will learn a great deal between now and then. We begin with options that are clear wins for the economy--that provide incentives for early action and opportunities for firms and industries to put in place voluntary plans to reduce emissions that reflect their own knowledge of how they can best proceed. We will work with industry to do our part to eliminate regulations that impede energy efficiency if we can do so without endangering the ultimate goals of those regulations. We will pursue a Federal government program to increase efficiency in our own operations. These are all win-win options. Our industries are excited about the possibility of working around the world to lower emissions in countries that are poised for rapid growth and have a real chance to avoid locking themselves into an energy intensive, CO2 intensive path of development. There are real opportunities here for American business that can jumpstart whole new industries and create good, high paying jobs in a dynamic sector.

Worldwide, countries that adhere to this treaty anticipate that the costs will be modest--otherwise we wouldn't be willing to sign it. My guess is that no President of the United States would undertake actions that would bankrupt this country economically in order to meet these obligations.

The most important reason we have to begin is that the costs of inaction are very real and we cannot ignore the environmental consequences of a failure to begin what will be a long journey. America has to show leadership in tackling this task.

## **CEA POSITIONS/ANALYSIS**

What did CEA do to get the results you reported from the SGM model?

- We first constructed region and country specific cost curves for carbon dioxide abatement from various SGM model runs. We added an EPA-developed analysis for non-CO2 GHGs for the United States and integrated these two sets of data to get marginal cost of emissions reduction for all 6 gases.

- We constructed baselines for all 6 gases for all Annex I countries to estimate the magnitude of necessary cuts required of Annex I countries under the Protocol.
- We identified market clearing prices for various trading blocs using the cost curves.
- We converted permit prices to estimated energy price effects and household impacts using data from Treasury.

What other work did CEA do with respect to Kyoto and when did CEA do it?

CEA has been actively involved both before and after Kyoto in economic analysis. CEA staffers participated in the IAT working group meetings. CEA has reviewed the full literature available on the subject of global climate change. We participated in interagency discussions through the NEC on all aspects of the treaty including domestic implementation, JI, technology initiatives, tax initiatives, developing country participation, targets and timetables. We have had a wide range of contacts with professional economists around the country who are working on this topic and have benefitted from analysis provided to us from a number of sources including the SGM modellers, the G3 modellers, the MERGE modellers, the EMF at Stanford. During Kyoto, CEA staff were in communication with the negotiating team to offer rough analysis of the likely impact on costs and permit prices of alternative proposals under consideration. We have also been involved in interagency discussions of electricity restructuring.

Wouldn't it have been a lot less costly to stretch out the timetable for reductions? Didn't CEA propose to go to 1990 by 2040?

The Administration had a thoroughgoing assessment and debate about targets and timetables. Arguments for going slower were made, including the argument of waiting for superior technology and avoiding premature shutdown of coal fired power plants. But there are also good reasons to move more rapidly. With effective international trading, many of the arguments for going slow lose force, since the reductions that are likely to be undertaken early on are cheap ones--the long hanging fruit-- and are not likely to entail either premature power plant shutdowns or premature use of technology. In addition, it was argued that credibility requires immediate action and not just the promise of future action. Moreover, diplomatic issues are also important: we wanted to obtain an international agreement to bring everyone on board. A slower timetable would not have commanded international agreement.

By how much will the agreement reduce temperatures?

How does your work differ from the IAT analysis? You seem to have relied on just one model

whereas they relied on three?

In forming our judgement about economic impact of the Kyoto accord we have relied on a broad range of tools including many energy sector models and reviews of the literature. We have also tried to take into account some features of the agreement and the President's climate change initiative that were not included in the IAT report, including sinks, 6 gases, electricity restructuring, and so forth. However, our results are broadly consistent with the results of the IAT report, which indicated that with international emissions trading, and joint implementation, the economic costs and impact on energy prices would be extremely modest. We also performed many simulations with the SGM model, which was included in the IAT report. In response to critiques of that study, our simulations typically involved less optimistic technological assumptions. We also attempted to perform analysis that was responsive to critiques of the IAT reviewers. In particular, we have consulted with the Stanford Energy Model Forum to encourage broad scrutiny of the Kyoto agreement and to gain insights from a wider array of energy models.

## **PAPER TONS/INTERNATIONAL TRANSFERS**

How can you justify giving Russia over 200 (214?)million metric tons of permits in excess of its emissions. It will not need such emissions until 2020.

The concept behind the international trading scheme adopted at Kyoto is that all countries with targets may trade to effect compliance. Countries can sell emissions permits if they hold their actual emissions below their allocations. Some countries will enjoy excess emissions credits because they are more efficient at domestic reductions, or because they have grown slowly or undergone a major economic transition. Allowing these countries to sell credits lowers the domestic costs of greenhouse gas reductions in the U.S. and provides those countries with the resources to invest in the most climate friendly technologies as their economies recover. Russia could easily need these permits if her growth resumes and Russia can also bank the permits for future periods when she is very likely to require them.

Aren't we transferring huge resources to Russia?

There will be no taxes on Americans or government transfers to Russia. However U.S. firms--not the U.S. government--may choose to purchase international emissions credits if they so desire to meet their emissions obligations--from Russia or other countries or through the CDM. As with any market transaction, purchases of these credits will have to comply with all U.S. legal and regulatory requirements. U.S. firms interested in international investment and emissions credits will have an incentive to ensure that other countries meet the international standards for adequately monitoring and reporting their emissions of GHGs. Russia will have a significant incentive to use the revenues to invest in modern, climate-friendly plants and equipments so that as its economy recovers,

it continues to produce emissions credits for sale on international markets.

How sensitive is the price to the U.S. to the Russian paper ton gift?

By how much will the total Kyoto agreement cut emissions relative to BAU given the 214 mmtc gift to Russia?

## **DEVELOPING COUNTRIES**

How much potential is there for reductions through JI?

Energy Efficiency is low, so the potential gains are large. A World Bank study suggested that emissions reductions in China before 2020 could save roughly as much in carbon emission as the U.S. would have to reduce to achieve 1990 levels by 2010 through negative cost energy efficiency improvements. Anecdotal evidence describes the untapped potential for efficiency gains in developing and transitional economies and highlights the success of JI pilot projects. Chinese coal fired boilers are only 2/3 as efficient as US boilers. Retro fitting Chinese plants with US boilers saves more money than it costs. Retrofitting Khrushchev era Russian apartments saves 30% of heat use and saves more money than it costs. Many other negative cost efficiency improvements have been identified for Russian industry, including the use of quality insulation around steam piping, improved energy control systems and more efficient motors. (Get examples.)

New Capacity. Due to their high growth rates, developing countries have an advantage over the OECD in their ability to meet targets by installing new, carbon efficient plants rather than by expensive retrofitting of existing plants. In the OECD, we face the prospect of replacing functional coal plants with new natural gas plants. Large changes in coal prices are needed to make that sensible. Developing countries will instead balance the costs of installing new natural gas plants against the costs of new coal. Little coal price adjustment is needed to make natural gas the economic choice.

Energy subsidies. The World Bank estimates that developing countries could reduce carbon emissions by 7-9% by eliminating energy subsidies.

How have JI Pilot Projects Worked?

Since its foundation in 1993, the US Initiative on JI has accepted 25 project proposals to help US firms tap potential outside the OECD for low cost carbon reduction. The projects included one in the Czech Republic that converted a district heating plant from coal to natural gas and built a cogeneration plant to provide steam and electricity. There was one in Costa Rica that replaced fossil fuel burning power sources with a 20 MW wind farm; and a project in Russia planted 506 hectares of trees. There is a large forest management project in progress in Bolivia that combines forest regeneration and

protection with the promotion of sustainable forest product enterprises. A project in Russia improves heat efficiency in Zelenograd simply by installing new heat exchangers, pumps and control equipment.

JI can, in addition to reducing carbon emissions, open up overseas markets, widen dissemination of advanced technologies and create local health and environmental benefits.

You say you need meaningful participation. What does that include?

Climate change is a global problem requiring a global solution. By 2030 or sooner, emissions from developing countries will surpass those from industrialized countries. Thus, developing countries must take measures to limit greenhouse gas emissions.

We will work bilaterally, regionally and multilaterally in the coming months and years to promote active efforts by developing countries to limit emissions. We will concentrate on key countries and approaches that are consistent with economic growth in these countries. We will not submit the Protocol to the Senate for advice and consent to ratification until we believe we have achieved meaningful participation.

Countries are at very different stages of industrialization and have very different contributions to global emissions. Accordingly, there is no one size fits all approach. Countries with high GDP, or those that emit proportionally larger share of global emissions should be expected to do more than those that are poor or whose emissions are negligible.

Under the Protocol developing countries can assume binding commitments voluntarily through amendment to the annex of the Protocol that lists countries with targets. (i.e. they can join Annex B.) They could then obtain access to the benefits of international emissions trading. Despite our efforts and the support of some developing countries, the Kyoto Protocol does not include a separate article for developing nations to assume voluntarily targets.

How does the Clean Development Mechanism work? Is it meaningful participation?

The Protocol makes a down payment on meaningful participation. First, they developing countries agreed to the creation of a CDM through which industrialized and developing countries can establish partnerships to cut emissions to the benefit of both parties. Specific projects, like the construction of a high-tech, low-emitting power plant--can include direct participation from the private sector. Industrialized countries and firms in them can use certified emissions reductions earned from such projects to contribute to their compliance while the developing countries get the technology they need for cleaner, more sustainable development. Private sector firms will be able to earn emissions credit

either directly, as a consequence of their active collaboration and investment in CDM projects, or indirectly, by purchasing the emissions reductions to offset greenhouse gas reduction at home. The activities will be designed to achieve real, measurable and long-term benefits related to the mitigation of climate change and they will achieve reductions that are additional to any that would occur in the absence of these activities. We will design mechanisms to ensure transparency, efficiency and accountability under the CDM through procedures for independent auditing and verification of project activities. Certified emission reductions obtained from 2000 to 2008 can be used to meet commitments in the first budget period. No government financing is anticipated. As developing countries understand that they can protect the environment without compromising their economies they may be encouraged to assume emission reduction commitments. Assumption of Annex B provides even larger benefits.

At present, it is undefined how much of a country's commitment can be met through the CDM. Our goal is to seek maximum flexibility.

Some of the proceeds will be shared with the most vulnerable nations to climate change. It is intended to benefit small island states with low lying coastal areas--not OPEC countries.

The Clean Development Mechanism will utilize existing institutions and be funded from a small share of the proceeds from each project certified to reduce greenhouse gas emissions. It is an arm of the Parties to the Protocol and not the World Bank. The developing countries also agreed to advance implementation of their existing commitments under the 1992 FCCC. This involves implementing national programs that consider actions in the energy, transportation, industrial and other sectors to mitigate climate change.

What assurance do we have that JI projects under the CDM will actually reduce emissions?

First, at U.S. insistence, states not in compliance with their measurement and reporting requirements (a national reporting and measurement scheme for GHG emissions) cannot receive credit. Second, we will have to set up a mechanism to insure additionality. THE CDM will serve as a clearinghouse for eligible projects. There will be a small executive board and "operational entities to be designated" to certify emission reductions from specific projects.

Now that the developed countries have agreed to reduce emissions, what incentives do the developing countries have to participate?

There is no solution without them and they are most affected by climate change. If they take on quantitative emissions limitations, they can participate in international trading.

## **INTERNATIONAL EMISSIONS TRADING**

How can we be sure countries that trade emissions permits are actually honoring their emissions obligations?

We need to establish the rules for the creation of verification and monitoring of emissions trading, JI and the CDM. These will be developed at COP-4 this November and the U.S. will work to ensure an acceptable approach. The U.S. will ensure that compliance with Protocol obligations is a condition for engaging in trading and other mechanisms under the Protocol.

The Administration will build upon its experience with the SO<sub>2</sub> emissions trading program in developing verifiable domestic and international trading regimes. This November, in Buenos Aires, the Parties to the FCCC will continue their work on emissions trading to define the "relevant principles, modalities, rules and guidelines" for verification and monitoring of emissions trading. Leading up to BA we will work hard diplomatically to build support for an appropriate emissions trading verification framework.

How will emissions trading work if only the United States has a domestic program of tradeable permits?

It is premature now to speculate on how foreign governments will design their emissions reduction programs. From our perspective, the private sector will play a critical role in trading; we envision U.S. firms actively participating in our domestic program as buyers, sellers, and intermediaries of emissions trading permits. Our goal will be to structure a similar role for the private sector in the international trading regime. One could envision a U.S. company, for instance, purchasing emissions permits from foreign counterparts, or eventually from private brokers (in the case of a private sector managed program) or dealing directly with a state-run emissions trading office in a foreign country that chooses to maintain more direct government involvement. Of course, if necessary, the USG will be prepared to facilitate trades where foreign governments institute public sector managed programs, but we do not envision the USG funding trades directly.

Aren't the monitoring difficulties so severe that trading isn't workable?

The rules and procedures for emissions trading are to be defined at the Fourth Conference

of the Parties (COP-4) in Buenos Aires this coming November. Until then, we will work hard to build a consensus on the structure of an emissions trading regime which provides the greatest flexibility for our private sector and domestic implementation.

## **BENEFITS OF AVERTING CLIMATE CHANGE**

What are some of the benefits of averting climate change and how did Nordhaus and others compute numerical valuations?

You have argued that there are benefits from dealing with climate change, but how much does the Kyoto agreement impact worldwide temperatures?

The Kyoto agreement must be viewed as the first step in a long process to cut emissions. The cutbacks agreed to there are not sufficient to maintain global concentrations at current levels. To maintain global concentrations at current levels, global reduction of approximately 60-70% of CO<sub>2</sub> emissions are needed. Even to stop CO<sub>2</sub> levels from more than doubling, larger cutbacks are needed. Developing country participation will be crucial to that because by 2030 it is predicted that their emissions will eclipse those of the industrialized nations.

## **SINKS**

What role could sinks play?

By including sinks, the Protocol gives proper incentives to avoid deforestation. Annex B Parties would have to reduce other emissions to a greater extent in the budget period to meet their targets to the extent that deforestation occurs--there is a penalty for that.

The Protocol creates incentives through the CDM in developing countries for afforestation and reforestation projects, as well as investments in clean technology. These efforts can partially fulfill the emission reduction commitments of industrialized countries. Annex B countries will see advantages to working with developing countries in these and other areas as a means of achieving cost-effective reductions. Through such projects, developing countries can obtain the financial resources, technology and know-how to promote their own sustainable development.

## **CLIMATE CHANGE INITIATIVES**

Aren't we doing too little over the next decade to prepare for the emissions reductions required in 2008-2012? Isn't it pretty late to introduce emissions trading only in 2008?

It is certainly important that we not wait until 2008 to begin preparing. But we intend to

do much over the next decade; and the signing of a treaty and knowledge that a permit system will be set up will provide signals now for taking appropriate action. Early action credit will reward those who take action before it is required. And we are trying to build on the voluntary efforts that industries told us they could achieve.

What can we expect from voluntary initiatives. Will they really work?

The Administration consulted extensively with industries in formulating the climate change policy. The cement industry told us...

Do you agree with the conclusion of the Five Labs Study?

How is the President's plan any different from the unsuccessful Climate Change Action Plan?

- It includes substantially more new technology spending and has the chance to kickstart markets for fuel efficient cars and equipment.
- A plan with binding targets creates expectations which can lead firms and households to begin to adjust their behavior sooner.
- The plan includes early credit to provide appropriate rewards for those who take prompt early action.
- It includes electricity restructuring.

## **Voluntary Industry Initiatives**

What voluntary initiatives does the Administration plan? What are the odds that they will cut emissions noticeably?

## **Federal Government Energy Initiative**

How much scope is there for improved efficiency in the Federal government?

## **Electricity Restructuring**

Won't electricity restructuring lower electricity prices and raise emissions?

- Electricity restructuring will lower prices and that does tend to raise CO<sub>2</sub> emissions. But other effects are also at work.
- There will be an improvement in energy efficiency which will lower emissions. Retail competition will provide a financial incentive for generating plant owners to improve their heat rate, reducing the amount of fuel burned to generate each kwh of electricity. In addition, competing retailers will likely increase value of their product to buyers by creating packages of electricity and efficiency services that take advantage of cost effective efficiency opportunities (such as those in the 5 Lab study) or by selling green power derived from renewables. Some of the increased demand for electricity will reduce end-use consumption of primary fuels, reducing emissions outside the electric sector.
- There will be some reductions to the a renewable portfolio standard, public benefits fund and green marketing provisions.
- Outside experts predict that in the long run, a small emissions reduction (20-40 MMT) is the best guess. Current emissions in the electric sector are 506 MMT project to rise to 26 MMT in 2010.

What is the impact of electricity restructuring on electricity prices?

It would reduce electricity prices by 0.5 to 1.1 cents per kw hour. A carbon tax of \$30 to \$70 has the same impact on electricity prices but raises other fuel prices too. It saves the average 4-person family about \$232-\$488 per year. This is the impact of a \$15 to \$35 carbon tax.

Five Labs Study--Potential for Negative Net Cost Emissions Cuts

Payoffs from Technology Initiative

**Diffusion:**

- It is widely acknowledged (Stavins and Jaffe) that energy use could be significantly reduced through broader adoption of existing technologies, and it is almost as widely accepted that much unadopted technology is cost-effective at current prices.
- Examples of proven technologies that engineering calculations show are cost effective at current prices but not widely used include compact fluorescent light bulbs, improved insulation materials and energy efficient appliances.
- Non-use may reflect a market failure. Possible sources of market failure include:
  - lack of information (of the innovation's existence and knowledge of its profitability); if others' use of a technology is an important source of information, adoption creates positive externalities because it generates information that is valuable to others.
  - Principal-agent problems: Energy efficiency decisions may be made by parties other than those who pay the bills. New home builders may not be able to credibly represent its energy conserving features to potential buyers (asymmetric information.) Landlords/tenants: landlord makes investment/tenant pays bill or vice versa.
  - Electricity and natural gas prices may be artificially low--not priced on the basis of marginal cost.

What are some of the Benefits of Averting Climate Change:

Rise in Sea Levels

Heating and Air Conditioning: Cline \$13 billion.

Severe Weather Events

Fresh Water: Cline, \$8 billion

Agricultural Impact: Cline, \$22 billion

Health Impact

Impact on ecosystems and biodiversity

Possibility of Catastrophes

Arguments over the discount rate

Uncertainty/Insurance

Estimates of 4.5% degree impact: Cline: annual damages of more than \$70 billion per year

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Christopher D. Carroll ( CN=Christopher D. Carroll/OU=CEA/O=EOP [ CEA ] )

CREATION DATE/TIME:24-FEB-1998 09:07:56.00

SUBJECT: Q&A for Social Security testimony today

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

READ:UNKNOWN

TEXT:

----- Forwarded by Christopher D. Carroll/CEA/EOP on  
02/24/98 09:07 AM -----

Peter R. Orszag

02/24/98 08:08:36 AM

Record Type: Record

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

cc:

Subject: Q&A for Social Security testimony today

Gene has approved the attached two sets of Q&A. If anyone else has any other comments, please let me know this morning.

Message Sent

To: \_\_\_\_\_

Joseph J. Minarik/OMB/EOP

DAVID.WILCOX @ MS01.DO.treas.sprint.com @ INET @ LNGTWY

Alan.Cohen @ MS01.DO.treas.sprint.com @ INET @ LNGTWY

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Barbara Chow/OMB/EOP

Jill M. Blickstein/OMB/EOP

Christopher D. Carroll/CEA/EOP

Janet Himler/OMB/EOP

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

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D95]MAIL40054445S.026 to ASCII,  
The following is a HEX DUMP:

## **HARD Q&A ON SOCIAL SECURITY**

**February 23, 1998**

### **Q: HOW ARE YOU SAVING THE SURPLUSES FOR SOCIAL SECURITY?**

- First, the President's policy is clear: we must Save Social Security First. That means that none of the surpluses should be drained for tax cuts or spending until Congress and the President have determined how to strengthen Social Security for the 21st century.
- Second, we expect to get Social Security reform accomplished within the next 12 to 20 months. Since our budget does not anticipate a surplus before FY 1999, we expect to accomplish comprehensive Social Security reform before any fiscal year surpluses accrue. The key point is to maintain the discipline of the budget rules to ensure that we don't pass legislation now that would spend the surpluses in the future.

### **FOLLOW: BUT DIDN'T THE PRESIDENT SAY THAT EVERY PENNY OF ANY SURPLUS SHOULD BE RESERVED UNTIL SOCIAL SECURITY IS REFORMED? HOW ARE YOU DOING THAT IN THE NEAR TERM -- LIKE THIS YEAR?**

- Again, the President's policy is clear: we must Save Social Security First. That means that none of the surpluses should be drained for tax cuts or spending until Congress and the President have determined how to strengthen Social Security for the 21st century.
- Second, the vast majority of the surpluses are expected after FY 1999, when we expect to accomplish comprehensive Social Security reform.
- And third, if surpluses were to accrue in the near term -- before Social Security reform is accomplished -- we can rely on the budget rules to ensure compliance with the President's proposal to save Social Security first. Those rules require that any new spending or tax cuts be paid for. What we are saying is that we will not consider any proposals to waive or change the normal budget and pay-as-you-go rules until Social Security reform is achieved.

### **FOLLOW: BUT HOW ARE YOU "RESERVING" ANY FY 1998 SURPLUS, IF IT WILL JUST BE USED TO BUY DOWN THE PUBLICLY HELD DEBT?**

A: First, we rely on the budget rules to ensure compliance with the President's proposal to save Social Security first.

Second, if a small surplus accumulates in FY 1998 -- which we won't know for sure until October 1998 -- the money would go to reducing publicly held debt. By not draining the surplus, we would have saved the money. And those savings could potentially be available if necessary for use in a comprehensive Social Security reform.

**Q: IF YOU ARE NOT WILLING TO OFFSET ANY SUPPLEMENTAL EMERGENCY SPENDING DURING FY 1998, HOW CAN YOU CLAIM TO BE RESERVING “EVERY PENNY OF ANY SURPLUS”?**

**A:** First, we rely on the budget rules to ensure compliance with the President’s proposal to save Social Security first.

Second, we don’t even know whether there will be a surplus for FY 1998. We won’t know that until late October, after the fiscal year is over.

Finally, whether we actually achieve a surplus in FY 1998 will depend on many factors -- including how revenues perform, and whether any emergency outlays are necessary to deal with unexpected national security imperatives or natural disasters. As you know, such emergency spending is not subject to offset requirements under the budget rules.

**Q: IF YOU ARE WILLING TO ALLOW EMERGENCY SPENDING WITHOUT AN OFFSET, WHY NOT A TAX CUT WITHOUT AN OFFSET IN FY 1998?**

**A:** Absolutely not. The budget rules recognize that emergencies happen, and treats emergency spending in a special way.

Passing a tax cut or spending program that was not offset would be a completely different matter, and would violate the budget rules that we rely on to ensure compliance with the President’s save Social Security first policy. We do not believe that the budget rules should be waived or changed for a tax cut or spending program that is not paid for.

**Q: WHAT IS YOUR POSITION ON THE RANGEL PROPOSAL OR OTHER PROPOSALS TO CREATE AN EXPLICIT RESERVE FUND?**

**A:** Again, we expect that the vast majority of surpluses will accrue after we have achieved reform, so this issue is not even relevant in that context.

Furthermore, if surpluses were to accrue before we could achieve reform, they would go to reducing the debt. Because we had saved the money, the amounts we save from reducing the publicly held debt could potentially be available if necessary for use in a comprehensive Social Security reform.

[If others believe than it would be helpful to have some accounting device to make this mechanism clearer, we would be willing to take a careful look at the proposal.]

**Q: IF YOU WON'T OFFSET EMERGENCY SPENDING IN FY 1998, WHY DO YOU SET UP AN EMERGENCY FUND IN FY 1999?**

**A:** Under current budget rules, emergency spending does not have to be offset. But since we had enough lead time, and since it is possible that emergency spending may be necessary for operations in Bosnia and elsewhere, we have tried to offer extremely responsible budgeting by providing a moderate reserve for emergencies for FY 1999. We will consider doing that again for future years when we submit future budgets.

Congress did not, however, create such a reserve for FY 1998. FY 1998 is already almost half over. Offsetting any emergency spending would thus be extremely difficult because, from a programmatic perspective, the offsets would have to be twice as large. Moreover, cuts of that magnitude at this late date would be incredibly disruptive to agencies and the public they serve because planning and commitments have already been made based on the level of appropriations that were enacted earlier.

**Q: YOU ARE ALLOWING FOR THE POSSIBILITY OF EMERGENCY SPENDING IN FY 1999. WILL YOU ALLOW FOR EMERGENCY SPENDING IN FY 2000 AND BEYOND?**

**A:** Normally, appropriations requests are made in the fullest detail for the upcoming fiscal year. Right now, the upcoming fiscal year is FY 1999. As we have said, we have tried to be extremely responsible by setting up a modest emergency reserve for FY 1999.

With regard to Fiscal Years 2000 and beyond, future budgets will provide detailed appropriations requests for their upcoming fiscal years. It is quite possible that such budgets could include emergency reserves as well.

**Q: BUT WHAT HAPPENS IF EMERGENCY REQUIREMENTS EXCEED THOSE THAT YOU HAVE BUDGETED FOR IN YOUR RESERVE IN FY 1999? IS IT ALL RIGHT TO DESIGNATE THOSE NEEDS AS EMERGENCIES AND NOT PAY FOR THEM?**

**A:** It is hard to answer a hypothetical question like that right now. If the reserve proves to be too small, we would have to take into account the full context of what's happening at that point and whether to seek offsets for the amounts in excess of the reserve. But that is a decision that can only be made at that time.

**Q: COULD YOU PLEASE DESCRIBE WITH SOME PRECISION HOW THESE SURPLUSES WOULD BE SAVED TO ASSIST THE SOCIAL SECURITY PROGRAM?**

- Our policy is that the surpluses projected in this budget should be reserved until we have addressed Social Security reform. "Reserved" means that the surpluses should not be drained for tax cuts or spending programs until Social Security reform is accomplished. The President has made it clear that we want to accomplish reform during the next two years.
- With regard to the ultimate Social Security reform package, many different proposals have been put forward about how the projected budget surpluses -- or some portion of them -- could be used to bolster the reform effort. For example, some have proposed transferring any reduction in publicly held Treasury securities resulting from a unified surplus to the OASDI Trust Funds, while others have proposed using the surpluses for equity investments in the Trust Funds, and still others have proposed using the unified surplus to fund individual accounts. The appropriate role of the surplus in the ultimate reform process is clearly a question that deserves careful scrutiny.

**Q: IN THE *WASHINGTON POST* ON FEBRUARY 4, 1998, FORMER CBO DIRECTOR ROBERT REISCHAUER SUGGESTS ONE CONCRETE PROPOSAL. COULD YOU PLEASE COMMENT ON THIS IDEA OR ANY OTHERS THAT THE ADMINISTRATION HAS CONSIDERED?**

- Again, our policy is that the surpluses projected in our budget should be reserved until we have addressed Social Security reform.
- The Reischauer proposal is one of the many proposals that have been put forward about how the projected budget surpluses could ultimately be used to bolster the reform effort. Others have proposed transferring any reduction in publicly held Treasury securities resulting from a unified surplus to the OASDI Trust Funds, and still others have proposed using the unified surplus to fund individual accounts. The appropriate role of the surplus in the ultimate reform process is clearly a question that deserves careful scrutiny.
- We look forward to an active national debate during 1998 over the best way to move forward, before hosting the White House conference in December and beginning bipartisan negotiations in January 1999.

**Q: WHAT DO YOU THINK ABOUT INDIVIDUAL ACCOUNTS?**

- First, we are strongly committed to maintaining the basic public trust embodied in the Social Security system. We believe it is essential to strengthen and protect Social Security for the 21st century, while also maintaining universality and fairness and

providing a benefit people can count on. And that means we are opposed to radical privatization of the system.

- Second, each of us must decide which comprehensive packages meet our basic tests. Specific elements will have to be considered within the context of an overall plan.

**FOLLOW: BUT DO YOU SUPPORT INDIVIDUAL ACCOUNTS?**

- We have asked a year of national education and discussion over the best bipartisan solution to strengthening Social Security for the 21st century. We look forward to a healthy and full examination of various different approaches, and individual accounts will certainly figure prominently in those discussions.
- But given our commitment to a national debate over the coming year, we don't think it would be productive to take all individual accounts in any form, and under any circumstances, off the table.
- Ultimately, specific elements will have to be considered within the context of an overall plan. And that overall plan must maintain the basic public trust embodied in the Social Security system.

**Q: BUT WHAT IS RADICAL PRIVATIZATION?**

A: I can't give you a specific quantitative definition. The basic question is whether Social Security continues to provide a foundation of retirement security that people can rely on.

**Q: WHAT IS THE ADMINISTRATION'S VIEW ON THE WEAVER PLAN (PSA PLAN FOR 5 PERCENT PERSONAL SECURITY ACCOUNTS)?**

A: First, let me note again that we are strongly committed to maintaining the basic public trust embodied in the Social Security system.

There are undoubtedly some plans that we do not support, because they undermine the basic public trust of Social Security.

But the President has declared that 1998 should be a year of national education and debate over the best bipartisan solution to strengthening Social Security, and at this point we'd rather not make any specific comments about any specific plans.

**Q: SPEAKER GINGRICH, REP. ARCHER, AND REP. KASICH HAVE CALLED FOR A COMMISSION TO MAKE RECOMMENDATIONS TO RESOLVE SOCIAL SECURITY'S FINANCIAL PROBLEMS. DOES THE ADMINISTRATION SUPPORT ESTABLISHING SUCH A COMMISSION?**

- What is critically important is that the American people become educated and engaged in the issue of Social Security reform, and that we be ready to begin bipartisan negotiations in January 1999. Our view is that a commission is not necessary as part of that process.
- For those who do think such a commission is necessary, we have two requests:

First, we do not want to politicize the debate. So any commission should be designed in a way that would not do so.

Second, we ask that they finish their work before the White House conference in December -- so that we will be ready to begin bipartisan negotiations in January 1999.

**Q: WOULD THE PRESIDENT CONSIDER RAISING THE PAYROLL TAX AS PART OF ANY SOLUTION TO RESTORE LONG-RUN SOLVENCY TO SOCIAL SECURITY?**

A: I don't foresee that at this time. We need to look at a broad mix of possible approaches to the long-run financing problem. We are confident that through a mutually agreeable bipartisan process, we can come up with a fair and workable solution to strengthening Social Security for the 21st century.

#### **SPECIFIC FOLLOW-UP QUESTIONS**

**Q: COULD THE SURPLUS BE USED TO FINANCE THE TRANSITION TO INDIVIDUAL ACCOUNTS?**

A: That is one of the uses that have been suggested for the surplus. Other suggestions include transferring bonds to the Trust Fund, or using the surplus to purchase equities for the Trust Fund. These are complicated proposals, which need to be examined and debated over the coming year.

**FOLLOW: BUT WHAT ABOUT USING THE SURPLUS SPECIFICALLY TO FINANCE THE TRANSITION TO INDIVIDUAL ACCOUNTS?**

A: Again, that is one of the proposals that have been put forward. It may be worth pointing out several of the factors that may be relevant to any examination of such a proposal:

First, as you know, is the series of broader issues that surround individual accounts. The

transition issue is only one of those issues, but is a crucially important one and one that is often overlooked. In any case, using the surplus to fund individual accounts clearly only makes sense if we decide as a nation that such accounts could be part of an overall Social Security reform that retains the fundamental progressivity and protections of the current system.

Second, the surplus may vary from year to year and may eventually disappear. Proponents of using the surplus to finance the transition to individual accounts must thus think carefully about how to handle annual fluctuations and what to do once the surpluses disappear.

These are the sorts of issues that must be examined before reaching any conclusion as to whether the surplus should be used to finance the transition to individual accounts. We look forward to a healthy national debate over questions like this one over the coming year.

**Q: DOES THE ADMINISTRATION SUPPORT INVESTING PART OF THE TRUST FUND IN EQUITIES?**

**A:** That is the sort of issue that will have to carefully considered over the coming year.

Many people have noted that stock market investment could yield higher rates of return, while others have noted that it would also entail higher risk.

Policy analysts have also pointed out difficult issues involving corporate governance and, more generally, the issue of the government's role in the stock market. All of these issues need to be carefully examined before drawing any conclusions about whether Social Security should invest in the stock market.

**Q: HOW SOON CAN WE EXPECT THE PRESIDENT TO PUT FORWARD A COMPLETE PLAN?**

- First, the President is firmly committed to strengthening the Social Security system within the next two years.
- Second, he has outlined a plan to raise the profile of the issue over the coming year, host a White House conference in December, and then begin bipartisan negotiations in January.
- Third, coming out with a full plan on our own would likely politicize the issue and set the overall reform effort back. So for now, we should focus on making sure that the American public understands the challenges we face and the benefits and limitations of various proposed solutions.

**Q: DOES THE ADMINISTRATION FAVOR A CPI MINUS X APPROACH TO**

## **COLAS?**

- A: The Administration's position on this issue has consistently been that we should use the most technically accurate measure of the cost-of-living. The Bureau of Labor Statistics has continued to make improvements in the CPI, and we look forward to continuing to try to improve the accuracy of our cost-of-living adjustments.

For example, I am pleased to note that the CPI that was released on February 24 will reflect the new market basket -- with goods from 1993-1995, rather than 1982-1984. This change is expected to reduce the rate of growth of the CPI by 0.15 percentage point per year.

## **Q: WHY DON'T YOU JUST BUY DOWN THE DEBT?**

- First, we want to provide a strong incentive for getting Social Security reform done. The Save Social Security First policy does that -- by preventing anyone from spending the surpluses until we have addressed Social Security reform.
- Second, the benefit of buying down the debt is that it reflects higher national saving. Some of the plans to use the surplus for Social Security would imply buying down the debt, and others would have the same impact in economic terms.

## **Q: WHAT ABOUT THE RECENT HERITAGE FOUNDATION STUDY THAT SUGGESTED NEGATIVE RATES OF RETURN UNDER SOCIAL SECURITY FOR MANY YOUNG, ESPECIALLY AFRICAN-AMERICAN, AMERICANS?**

- First, the study has been sharply criticized because of the methodology it uses, which is fundamentally flawed and misleading. The Social Security Actuaries have issued a letter stating that the report's "conclusions are highly misleading due to two major errors in methodology, plus a number of incorrect or inappropriate assumptions." [Memo from Steve Goss, Deputy Chief Actuary, February 4, 1998.]
- Second, it neglects disability insurance, part of the overall Social Security benefit package. An ongoing SSA study suggests that non-whites have fared relatively better under the DI program than whites.
- Third, while African Americans on average have higher mortality rates (which reduce their rate of return to Social Security since they collect benefits for fewer years), they also tend to have lower incomes (which raise their rate of return, since Social Security benefits are progressive). The Heritage study effectively only looked at the first of these effects. When both effects are taken into account, according to a 1993 study, the net result is that African Americans have historically earned a slightly *higher* rate of return on Social Security than whites.

**Q: IF EVERYTHING IS ON THE TABLE, DOES THAT INCLUDE CUTS IN BENEFITS TO SENIORS?**

A: One of the motivations for acting early on this long-run challenge is that it provides time to ensure that any necessary adjustments are gradual.

We think it is very important to avoid unnecessarily abrupt changes to benefit levels that had been counted on for retirement, disability, or survivor income.

So while everything is on the table, it seems reasonable to suggest that a fair outcome would avoid imposing inappropriate changes on those who have already retired or who plan to retire in the near future.

**Q: ISN'T SOCIAL SECURITY A LOUSY DEAL TODAY?**

A: No.

- First, remember that the system provides a guaranteed monthly benefit to retirees.
- Second, it provides disability insurance -- providing security to America's workers.
- Third, it provides survivors' insurance -- equivalent, for the average young family with two children, to a life insurance policy of about \$300,000.
- Fourth, it provides a fair annuity that is indexed to inflation -- an asset that is difficult to obtain in the private market.
- Finally, the real "rate of return" provided by Social Security is positive now, even after adjusting for inflation, and will be so in the future for almost all workers.

Social Security helps to keep 15 million Americans out of poverty. There is no more efficient insurance program in existence—in excess of 99 cents are paid in benefits by Social Security for each dollar of taxes put in by workers and their employers.

We must work together in a bipartisan effort to assure the continuation of the economic security provided by the program and to enhance the return that future generations can expect.

**Q: ISN'T RESERVING THE "BUDGET SURPLUS" FOR SOCIAL SECURITY JUST DOUBLE COUNTING, SINCE THE ENTIRE SURPLUS RESULTS FROM SOCIAL SECURITY IN THE FIRST PLACE?**

A: The crucial point is the following: we face a choice about how to use the projected unified surpluses, whatever their origins. The President has made clear his priority: don't touch those surpluses until we have addressed Social Security reform.

The fact that right now, the Social Security system is a strong positive contributor to the unified budget provides an additional motivation for ensuring that the surpluses are not spent until we address the long-run challenge facing the system.

**Q: SENATOR HOLLINGS AND OTHERS HAVE CLAIMED THAT WE DON'T REALLY HAVE A SURPLUS. SHOULDN'T YOU BALANCE THE NON-SOCIAL SECURITY BUDGET?**

- First, the unified budget is the traditional measure used to analyze the budget. It determines the net change in publicly held debt. Alan Greenspan has said that "the major concern that we at the Federal Reserve have is with the unified budget."
- Second, the most important objective for us is to continue raising our national saving rate -- up from 3.1 percent of GDP in 1992 to 6.4 percent now, largely because we have cut the Federal deficit by over 90 percent. The unified budget reflects the Federal government's contribution to national saving.
- Third, in the future, balancing the unified budget will mean running a surplus in the non-Social Security budget -- because Social Security will move from surplus to deficit. We have brought the non-Social Security budget deficit down consistently, and our FY 1999 budget will continue to do so.

## **SOCIAL SECURITY Q&A**

**February 23, 1998**

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A: I don't foresee that at this time. We need to look at a broad mix of possible approaches to the long-run financing problem. We are confident that through a mutually agreeable bipartisan process, we can come up with a fair and workable solution to strengthening Social Security for the 21st century.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Rosina M. Bierbaum ( CN=Rosina M. Bierbaum/OU=OSTP/O=EOP [ OSTP ] )

CREATION DATE/TIME:24-FEB-1998 13:24:09.00

SUBJECT: 3+ sentences for Yellen's testimony about health impacts

TO: Janet L. Yellen ( CN=Janet L. Yellen/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:

----- Forwarded by Rosina M. Bierbaum/OSTP/EOP on  
02/24/98 01:22 PM -----

Susan L. Bassow

02/24/98 11:12:12 AM

Record Type: Record

To: Rosina M. Bierbaum/OSTP/EOP

cc: Peter W. Backlund/OSTP/EOP

Subject: 3+ sentences for Yellen's testimony about health impacts

Climate change will impact human health in a variety of ways. Warmer temperatures will increase the frequency and severity of extreme heat waves such as the one that killed 465 people in Chicago in July 1995. Today such events occur about once every 150 years; in a world with doubled pre-industrial CO2 levels, such events could be 6 times more frequent. Climate change may also lead to the expansion of the ranges of mosquitoes and other disease-carrying organisms, as well as their transmission rates of the diseases. This could result, for example, in 50 ) 80 million additional malaria cases worldwide per year by 2100.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:24-FEB-1998 18:28:39.00

SUBJECT: Consistency

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: JONATHAN.GRUBER ( JONATHAN.GRUBER @ MS01.DO.treas.sprint.com @ inet [ UNKNOWN ] )

READ:UNKNOWN

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

READ:UNKNOWN

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

READ:UNKNOWN

TEXT:

The attached file reviews consistency of the draft testimony with Janet's October 3rd memo. I think that the memo and testimony can be reconciled by saying that we will do trading in a way that succeeds in getting real cost savings. Nonetheless I suggest that people who haven't looked at this lately take a look at the attached file next time they look at the testimony.

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

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D85]MAIL44371845D.026 to ASCII,  
The following is a HEX DUMP:

## Testimony: Consistency With Other CEA Statements

A review of the current draft testimony suggests the greatest risk of inconsistency with earlier statements is in the area of successful international permit trading. Excerpts of the October 3rd memo signed by Janet and Larry Summers follow and might usefully be compared with the current testimony. [*Emphasis added.*]

### 1) The Executive Summary states

- “An ‘*idealized*’ system of international permit trading among Annex I countries could *hypothetically halve* the change in carbon emissions prices needed to attain a 1990 by 2010 goal. This would mean paying Russia and other Eastern European countries to reduce emissions in place of the United States. However, such an arrangement could prove *infeasible for a number of reasons*, including difficulties in establishing adequate enforcement and monitoring mechanisms in the near term. Joint implementation with non-Annex I countries is likely to *marginally* reduce the impact on energy prices in the United States.”

### 2) The body of the October 3 memo states

- “The *actual benefits of an [international permit trading] system are apt to fall short of this utopian portrayal* in part because countries are not obliged to fulfill their Kyoto commitments via a domestic permit trading scheme.”
- “Controls and guarantees [to ensure the integrity of permits] will surely inhibit the efficiency of the market and *render some --possibly much-- of the estimated savings illusory*. In fact, most of the benefits projected from the international sale of permits come from inducing emissions reductions from countries in Eastern Europe and the former Soviet Union -- countries with particularly weak tax collection and enforcement mechanisms. Without these countries in the [trading] scheme, the gains from international trading of permits will be very small.”
- “A *project-oriented approach to joint implementation* will, in effect constitute a limited form of international trading with high transaction costs. As a result, it *will probably capture only a small fraction of the total benefits of full international trading*. In contrast, model results concerning the benefits of JI treat it as equivalent to idealized international trading.”

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:24-FEB-1998 11:34:24.00

SUBJECT: statement

TO: Sandra F. Daigle ( CN=Sandra F. Daigle/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.D9]MAIL40097545S.026 to ASCII,

The following is a HEX DUMP:

STATEMENT OF JANET L. YELLEN

Today, we got more good news about the performance of our economy and the confidence that American's have that our economy will remain healthy and strong.

Today, the Labor Department reported that the Consumer Price Index (CPI), which is the measure of inflation at the retail level, was unchanged in January. And, the core CPI -- which excludes the volatile food and energy components -- rose just 0.2 percent. These numbers suggest that inflation is still clearly contained.

Over the past year, we have experienced a remarkable period of price stability and low unemployment. Over the 12 months ending in January, the CPI rose just 1.6% -- down from its 3% year-earlier increase. And, the core CPI increased just 2.2 percent -- down from the 2.5 percent year-earlier rate. At the same time, the unemployment rate has remained below 5 percent for the past 10 months. This combination has helped to make lasting changes in the living standards all Americans.

We also learned today that consumer confidence remains at record high levels. For February, the Conference Board's index of consumer confidence jumped by 10 index points to a 30 year high.

Today's numbers indicate that our economy is still going strong: growth is robust, businesses are investing in new and better equipment, unemployment remains low at 4.8 percent, workers are enjoying real wage gains, inflation is in check, and consumer confidence is high.

The Administration's strategy for raising American living standards and enhancing the economy's long-run growth rate is working: the economy is the strongest it has been in a generation.

Even with the financial turmoil in East Asia, the economy is likely to continue in the coming months on a path of solid growth with low unemployment and inflation remaining in check.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:25-FEB-1998 12:06:41.00

SUBJECT: 3+ sentences for Yellen's testimony about health impacts

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

TEXT:  
----- Forwarded by Janet L. Yellen/CEA/EOP on 02/25/98  
12:06 PM -----

Rosina M. Bierbaum  
02/24/98 01:24:23 PM  
Record Type: Record

To: Adele C. Morris/CEA/EOP, Janet L. Yellen/CEA/EOP  
cc:  
Subject: 3+ sentences for Yellen's testimony about health impacts

----- Forwarded by Rosina M. Bierbaum/OSTP/EOP on  
02/24/98 01:22 PM -----

Susan L. Bassow  
02/24/98 11:12:12 AM  
Record Type: Record

To: Rosina M. Bierbaum/OSTP/EOP  
cc: Peter W. Backlund/OSTP/EOP  
Subject: 3+ sentences for Yellen's testimony about health impacts

Climate change will impact human health in a variety of ways. Warmer temperatures will increase the frequency and severity of extreme heat waves such as the one that killed 465 people in Chicago in July 1995. Today such events occur about once every 150 years; in a world with doubled pre-industrial CO2 levels, such events could be 6 times more frequent. Climate change may also lead to the expansion of the ranges of mosquitoes and other disease-carrying organisms, as well as their transmission rates of the diseases. This could result, for example, in 50 ) 80 million additional malaria cases worldwide per year by 2100.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:25-FEB-1998 20:20:17.00

SUBJECT: NEC

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

READ:UNKNOWN

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

READ:UNKNOWN

TEXT:

I attended Wednesday's Sally Katzen NEC deputies meeting. It appears that topics that may come up at this week's NEC principals mtg. (held on Friday this week, so Larry Stein can attend) are:

introducing Stein (the new Hilley)

Electricity restructuring

bankruptcy reform, reg reform, and NEXTEA

international stuff, including Farewell to Tarullo, possible Asian crisis

report, and report from Gene on last week's Employability conference in UK.

I will circulate the revised version of the list of working groups (the international pages were withdrawn, when Sally realized that she was not on top of that).

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:25-FEB-1998 17:12:51.00

SUBJECT: oral testimony draft.

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

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

TEXT:  
I

This draft oral testimony is cut and paste from the most recent draft  
written testimony. Material I was tempted to cut is in "[ ]". ===== ATTACHMENT 1  
=====

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

TEXT:  
Unable to convert ARMS\_EXT:[ATTACH.D56]MAIL49725755L.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 AGREEMENT  
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 President's statement.

The international agreement that was reached in Kyoto this past December is a crucial first step in addressing global climate change. But it is only a first step. 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, such as meaningful developing country participation, the ability of sinks to offset emissions requirements and emissions 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 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 achieving modest reductions in greenhouse gas emissions.

**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.

Despite the difficulties of deriving quantitative or monetary estimates of the damages from climate change, researchers have nonetheless developed estimates that prompt substantial concern. The IPCC reports that a doubling of carbon dioxide levels would lead to about 6,000 to 10,000 additional deaths per year 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 substantially greater increases subsequently.

Respected researchers have also 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 more than \$70 billion per year on the U.S. economy in today’s terms. These damages include \$22 billion in lost agricultural production, \$13 billion in additional electricity costs, and \$8 billion in new costs to maintain the existing supply of fresh water. (Figures adjusted to 1997 dollars.) Other researchers have derived other estimates, and the uncertainties among these estimates are quite substantial.

## **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 Agreement, 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.

The problem of climate change is global and so requires a global solution. Accordingly the President has made clear that he will not submit the Kyoto agreement to the Senate without meaningful participation from key developing countries (who are not included in Annex I).

The nature of the climate change problem also suggests three basic methods to lower costs of achieving given levels of environmental protection. As a result of U.S. diplomatic efforts, these methods are broadly reflected in the Kyoto accord. They can be characterized in terms of flexibility over when, where, and what emissions are reduced.

## **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.

Because the results from any model must be treated with caution, we have employed a

broad set of economic tools to assess the Kyoto agreement. To my knowledge, no model no model is currently designed to assess Kyoto's treatment of sinks, or all six greenhouse gases. We have used the Second Generation Model of Battelle Labs, 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, sinks, a possible trading arrangement that could include a subset of the Annex I countries and the Clean Development Fund.

A comprehensive economic evaluation of the economic impact of the Kyoto agreement 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 timetables specified in the Kyoto agreement, will be modest relative to the value of the insurance against climate change we are purchasing. [Model results reflecting the details of the Kyoto Protocol are consistent with our conclusion. For example, under the assumptions 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 adjust

for the inclusion of six gases, 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 non-climate 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.]

Provided that we are successful in international negotiations including those at Buenos Aires, our overall conclusion is that the economic impact of the Protocol will be modest relative to the value of the insurance against climate change that the Kyoto agreement provides.

I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Agreement and evaluating the net 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:26-FEB-1998 14:52:52.00

SUBJECT: Revised Summary

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: 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

TEXT:

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D85]MAIL42754565O.026 to ASCII,  
The following is a HEX DUMP:

**SUMMARY OF TESTIMONY BY DR. JANET YELLEN  
CHAIR, COUNCIL OF ECONOMIC ADVISERS**

- \* ***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. Key elements of the international agreement reached in Kyoto in December and the Administration's policy can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth -- elements such as international emissions trading, meaningful developing country participation, the ability of sinks to offset emissions requirements, and the inclusion of six gases.
- \* ***The Kyoto Agreement is a form of "planet insurance."*** If left uncontrolled, disruption of the Earth's climate may pose substantial costs in terms of harm to commerce and the environment alike. Despite the difficulties of coming up with monetary assessments of the damages from climate change, researchers have nonetheless developed troubling cost estimates. These estimates range in the tens of billions of dollars per year for temperature changes projected to occur in the next century.

*For example, the Intergovernmental Panel on Climate Change estimates that a doubling of carbon dioxide levels would lead to about 6,000 to 10,000 additional deaths per year 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 substantially greater increases subsequently.*

These estimates do not, and cannot, accurately reflect the value of reducing the small and unknown possibility 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 subarctic permafrost. The Kyoto agreement is a form of "planet insurance" to guard against these catastrophic climate effects.

- \* ***Conclusion: 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.*** Any economic analysis of the Administration's climate change policies is difficult for three key reasons: 1) there are uncertainties over the terms of the ultimate treaty; 2) there are inherent limitations of available models to analyze even short-term costs and benefits; and, 3) it is impossible to put a single monetary number on the long-term benefits of climate change mitigation.

- \* ***Other Administration climate change policies may reduce costs in a manner that can not be captured in this economic evaluation.*** There will be additional payoffs from the full package of proposed Administration climate change initiatives. For instance, 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 efforts to reduce greenhouse gas emissions. The President also supports electricity restructuring in a manner that will offer approximately \$20 billion in cost savings to electricity consumers, while achieving modest reductions in greenhouse gas emissions.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 12:39:07.00

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

READ:UNKNOWN

TEXT:

It would be useful to have your comments ASAP. Michele needs to circulate  
this to Todd and others right away.

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

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D24]MAIL43886465D.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 AGREEMENT  
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 President's statement.

The international agreement that was reached in Kyoto this past December is a crucial first step in addressing global climate change. But it is only a first step. 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, such as international emissions trading, meaningful developing country participation, the ability of sinks to offset emissions requirements, and the inclusion of six gases, 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 about 6,000 to 10,000 additional deaths per year 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 substantially greater increases subsequently. If left uncontrolled, disruption of the Earth's climate may 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.

Despite the difficulties of deriving quantitative or monetary assessments of the damages from climate change, researchers have nonetheless developed estimates that prompt substantial concern. For example, William Cline estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of more than \$70 billion per year on the U.S. economy in today's terms. These damages include \$22 billion in lost agricultural production, \$13 billion in additional electricity costs, and \$8 billion in new costs to maintain the existing supply of fresh water. (Figures adjusted to 1997 dollars.) Other aggregate estimates of the economic damage from global warming lie in a similar range, although there remains considerable debate among researchers about the valuation of particular impacts. In addition, these estimates do not, and cannot, accurately reflect the value of reducing the small and unknown possibility of large-scale and potentially irreversible discrete events with potentially catastrophic consequences, such as warming of the Northern tundra sufficient to release very large amounts of methane from the

subarctic permafrost. Evaluations of such catastrophic risks are especially important in evaluating whether the benefits of a particular climate control policy justify the costs. There is a strong argument for the Kyoto agreement as a form of planet insurance.

### **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 Agreement, 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 achieve our objectives in the most efficient way; and the effort must be global, to address the inherently global nature of the problem. 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 “what”, “where”, and “when” flexibility.

As a result of U.S. diplomatic efforts, all three forms of flexibility are broadly reflected in the Kyoto accord. The inclusion of all six greenhouse gases and certain sink activities that promote removal of carbon from the atmosphere provide substantial “what flexibility”--enabling trading across emissions reductions sources to lower the cost of meeting our target. 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 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 agreement. 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 agreement 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 Agreement, 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. We have not attempted to quantify 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. That small net premium, even excluding the benefits of mitigating climate change itself, in effect, purchases a partial insurance policy against a serious environmental threat. As I explain in my written testimony, this conclusion is not entirely dependent on, but is fully consistent with, formal model results.

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 achieving 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 Agreement and evaluating the net 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:26-FEB-1998 14:37:47.00

SUBJECT: Summary of 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: 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

TEXT:

Randy and Joe: The attached "summary" that Michele prepared includes the  
Cline numbers. What do you think? ===== ATTACHMENT 1 =====

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D47]MAIL412635652.026 to ASCII,  
The following is a HEX DUMP:

**SUMMARY OF TESTIMONY BY DR. JANET YELLEN  
CHAIR, COUNCIL OF ECONOMIC ADVISERS**

- \* ***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. Key elements of the international agreement reached in Kyoto in December and the Administration's policy can ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth -- elements such as international emissions trading, meaningful developing country participation, the ability of sinks to offset emissions requirements, and the inclusion of six gases.
- \* ***The Kyoto Agreement is a form of "planet insurance."*** If left uncontrolled, disruption of the Earth's climate may pose substantial costs in terms of harm to commerce and the environment alike. Despite the difficulties of coming up with monetary assessments of the damages from climate change, researchers have nonetheless developed troubling cost estimates. These estimates range in the tens of billions of dollars per year for temperature changes projected to occur in the next century.

*For example, William Cline estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of more than \$70 billion per year on the U.S. economy in today's terms. These damages include \$22 billion in lost agricultural production, \$13 billion in additional electricity costs, and \$8 billion in new costs to maintain the existing supply of fresh water. (Figures adjusted to 1997 dollars.)*

These estimates do not, and cannot, accurately reflect the value of reducing the small and unknown possibility 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 subarctic permafrost. The Kyoto agreement is a form of "planet insurance" to guard against these catastrophic climate effects.

- \* ***Conclusion: 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.*** Any economic analysis of the Administration's climate change policies is difficult for three key reasons: 1) there are uncertainties over the terms of the ultimate treaty; 2) there are inherent limitations of available models to analyze even short-term costs and benefits; and, 3) it is impossible to put a single monetary number on the long-term benefits of climate change mitigation.

- \* ***Other Administration climate change policies may reduce costs in a manner that can not be captured in this economic evaluation.*** There will be additional payoffs from the full package of proposed Administration climate change initiatives. For instance, 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 efforts to reduce greenhouse gas emissions. The President also supports electricity restructuring in a manner that will offer approximately \$20 billion in cost savings to electricity consumers, while achieving modest reductions in greenhouse gas emissions.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 14:15:22.00

SUBJECT: Talking points

TO: Janet L. Yellen ( CN=Janet L. Yellen/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.D99]MAIL46922565G.026 to ASCII,  
The following is a HEX DUMP:

**SUMMARY OF TESTIMONY BY DR. JANET YELLEN  
CHAIR, COUNCIL OF ECONOMIC ADVISERS**

- \* ***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. Key elements of the international agreement reached in Kyoto in December will ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth -- elements, such as international emissions trading, meaningful developing country participation, the ability of sinks to offset emissions requirements, and the inclusion of six gases.
- \* ***The Kyoto Agreement is a form of "planet insurance."*** If left uncontrolled, disruption of the Earth's climate may pose substantial costs in terms of harm to commerce and the environment alike. Despite the difficulties of coming up with monetary assessments of the damages from climate change, researchers have nonetheless developed troubling cost estimates.

*For example, William Cline estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of more than \$70 billion per year on the U.S. economy in today's terms. These damages include \$22 billion in lost agricultural production, \$13 billion in additional electricity costs, and \$8 billion in new costs to maintain the existing supply of fresh water. (Figures adjusted to 1997 dollars.)*

These estimates do not, and cannot, accurately reflect the value of reducing the small and unknown possibility 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 subarctic permafrost. The Kyoto agreement is a form of "planet insurance" to guard against these catastrophic climate effects.

- \* ***Conclusion: 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.*** Any economic analysis of the Administration's climate change policies is difficult for three key reasons: 1) there are uncertainties over the terms of the ultimate treaty; 2) there are inherent limitations of available models to analyze even short-term costs and benefits; and, 3) it is impossible to put a single monetary number on the long-term benefits of climate change mitigation.

- \* ***Other Administration climate change policies may reduce costs in a manner that can not be captured in this economic evaluation.*** There may be additional payoffs from the full package of proposed Administration climate change initiatives. For instance, 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 efforts to reduce greenhouse gas emissions. The President is also supporting electricity restructuring in a manner that will offer approximately \$20 billion in cost savings to electricity consumers, while achieving modest reductions in greenhouse gas emissions.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 14:18:07.00

SUBJECT: Re: amendment to possible answer to a question about variations in family expenditures

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

TO: Janet L. Yellen ( CN=Janet L. Yellen/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

TEXT:  
----- Forwarded by Randall W. Lutter/CEA/EOP on 02/26/98  
02:14 PM -----

Randall W. Lutter  
02/26/98 02:15:58 PM  
Record Type: Record

To: Peter R. Orszag/OPD/EOP  
cc:  
Subject: Re: amendment to possible answer to a question about  
variations in family expenditures

I have revised the testimony to include the following, which may be a helpful response to this question.

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: these annual changes have averaged 3.8 percent

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 08:22:58.00

SUBJECT: Background paper on why 7% is really 3%

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

READ:UNKNOWN

TEXT:

Hi Janet,

FYI: I've written up a short calculation of why 7% below the Kyoto baseline is really no more than 3% below the President's proposal, using carbon data and accounting for the other six gases.

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

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D49]MAIL484803655.026 to ASCII,  
The following is a HEX DUMP:

## **Why 7% below Kyoto's "1990 levels" is no more than 3% below the President's proposal: a calculation**

This paper compares the carbon numbers associated with the United States emissions commitment under the Kyoto Protocol with the commitment the President made in his October speech. The Kyoto Protocol and the President's speech differ both in the emissions budget and in the emissions accounting system that will determine the emissions that must be below the budget for compliance with the treaty, *so the targets cannot be compared directly*. The most significant differences between the two commitments are<sup>1</sup>:

(1) Under the Kyoto Protocol, each party has its choice of 1990 or 1995 as a base year for emissions of three greenhouse gases: HFC, PFC, and SF6. The U.S. had 13 MMTCE more emissions of these gases in 1995 than in 1990, making the option of a 1995 base year less restrictive.

(2) Under the Kyoto Protocol, the emissions budget is based only on gross emissions, not counting the carbon sequestered by forests in the base year (1990), the "sinks." The effect of this difference is to make the Kyoto budget less strict than it would have been using the President's assumption that the budget would be based on net emissions.

(3) Under the Kyoto Protocol, the emissions accounting system includes only certain land use changes and forestry activities in its calculation of sinks, rather than the carbon activity in all U.S. forests. The effect of this provision relative to the President's plan depends on the methodology developed to account for sinks under the Kyoto agreement.<sup>2</sup>

### **The Kyoto Protocol**

#### **(A) The Kyoto Target**

Emissions budget =  $5 \text{ years} \times (1990 \text{ Emissions of CO}_2, \text{CH}_4, \text{N}_2\text{O} + 1995 \text{ Emissions of HFC, PFC, and SF}_6) \times 93\%$

<sup>1</sup> All the figures are expressed in millions of metric tons of carbon equivalent (MMTCE), which controls for the different greenhouse warming potentials of the different gases.

<sup>2</sup> These 1990 and 1995 emissions figures are from the Climate Action Report. The 1990 emissions figure for N<sub>2</sub>O is being revised with better data, using the 1996 methodology, for mobile source emissions. As of 2/23/98, the increase is estimated by EPA at 72 MMTCE. The revised figures mean that the Kyoto target will probably be higher than 1484. The emissions accounting system for the budget period will also reflect these methodological changes, so the practical effect of these revisions is minimal. Note that the revisions would also apply to the figures in the section below that describes the President's plan.

|                                                                        |              |
|------------------------------------------------------------------------|--------------|
| 1990 Emissions of CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O | = 1559 MMTCE |
| 1995 Emissions of HFC, PFC, and SF <sub>6</sub>                        | = 37 MMTCE   |
| Total baseline emissions                                               | = 1596 MMTCE |

Kyoto Emissions Budget, total for first budget period = 5 years × (1596) × 93% = 7421 MMTCE

|                                                        |
|--------------------------------------------------------|
| <b>Annual Average Budget in 2008-2012 = 1484 MMTCE</b> |
|--------------------------------------------------------|

## **(B) The Kyoto Accounting System**

2008-2012 emissions = [Total emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC, PFC, SF<sub>6</sub>]  
 - [net changes of carbon stocks “from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation, and deforestation since 1990, measured as verifiable changes in stocks in each commitment period” ]

## **The President’s Announcement**

### **(A) The President’s October Target**

Under the President’s October plan, the emissions target for the United States would be written:

Emissions Budget = 5 years × [(1990 Emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and HFC, PFC, and SF<sub>6</sub>) -  
 (net changes carbon stocks from all forests, including forest soils)]

Note that the budget equation includes sinks, which all else equal makes the budget tighter for the United States, which experienced positive sequestration in forests in 1990.

|                                                                        |        |       |
|------------------------------------------------------------------------|--------|-------|
| 1990 Emissions of CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O | = 1559 | MMTCE |
| 1990 Emissions of HFC, PFC, and SF <sub>6</sub>                        | = 24   | MMTCE |
| Carbon activity in forests (sequestration)                             | = -282 | MMTCE |
| Net emissions                                                          | = 1301 | MMTCE |

President’s Plan Emissions Budget = 5 years × (1301) = 6505 MMTCE

|                                                        |
|--------------------------------------------------------|
| <b>Annual Average Budget in 2008-2012 = 1301 MMTCE</b> |
|--------------------------------------------------------|

### **(B) The President’s October Accounting System**

2008-2012 Emissions Calculation = [Total emissions of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFC, PFC, SF<sub>6</sub> 2] -  
 [net changes of carbon stocks from all U.S. forests]

### **Comparison: How much lower is the Kyoto target than the President's plan?**

Recall that the two plans entail different accounting systems for the emissions that must be within budget, *so the budgets of the two commitments (1484 and 1301) are not directly comparable.*

#### **The Kyoto commitment:**

[Total emissions of all six gases] - [net changes of carbon stocks from certain activities] < 1484

Since the sink accounting system under the Kyoto Protocol is not yet determined, we must make an assumption about the net changes of carbon stocks from the activities specified in the treaty. The U.S. has said that the accounting system for carbon sinks will not increase the emissions calculation under the Protocol, and may in fact offset our emissions. If we assume that sinks are zero, that is they neither offset U.S. emissions nor contribute to them, then the Kyoto commitment is:

[Total emissions of all six gases] - 0 < **1484**

#### **President's plan:**

[Total emissions of all six gases] - [net changes of carbon stocks from all U.S. forests] < 1301

The change in carbon stocks from all U.S. forests in 2010 is estimated by USDA and EPA to be about 227 MMTCE. If that figure is about average for the budget period, the President's commitment would be equivalent to:

[Total emissions of all six gases] - 227 < 1301, or equivalently,  
[Total emissions of all six gases] < **1528** (the total of the budget plus offsets by sinks)

Then the comparison question is: **how much lower is 1484 than 1538?**

Algebraically, the percentage difference,  $x$ , can be expressed:  $1484 = (1-x)1538$   
 $\Rightarrow x = 1 - 1484/1538 = .03$   
 $\Rightarrow$  **1484 is 3% below 1538.**

What if accounting for sinks under the Protocol offsets our emissions, as we expect they may do? Then the total emissions of all six gases can be *higher* than 1484 by the amount of carbon sequestered in the eligible land use activities. That makes the Kyoto Protocol even less than 3% more stringent than the President's plan.

**Conclusion: The Kyoto agreement is no more than 3% more stringent than the Presidents plan.**

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 14:42:43.00

SUBJECT: Re: Summary of Testimony

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

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

TEXT:

Inclusion of the Cline figures, and even the "tens of billions figure" may be seen as inconsistent with your later claim that

"it is impossible to put a single monetary number on the long-term benefits of climate change mitigation."

In addition the tens of billions should be qualified with a statement "sometime" or "later" in the next century.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 11:38:24.00

SUBJECT: PRIORITY: 5pm NEC prins. mtg. on Japan

TO: HOPKINS\_M ( HOPKINS\_M @ A1 @ CD @ VAXGTWY [ UNKNOWN ] ) (CEA)  
READ:UNKNOWN

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

TEXT:

Malcolm Lee just relayed a request from Dan Tarullo that either Janet or I make a very short presentation at today's 5:00 meeting on outlook for the next few quarters for Japanese growth and trade balance (incl. current account, and bilateral with US, I guess.)

Mark, I am afraid this takes priority over WEB, unless Jon can do it before he leaves: Please assemble as many recent forecasts as you can.

Lisa has a document from Treasury.

JF

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 13:58:52.00

SUBJECT: between draft draft.

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

TEXT:

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

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

TEXT:

WPC

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T! 57XXdd7TESTIMONY OF DR. JANET YELLEN h CHAIR, COUNCIL OF ECONOMIC ADVISERS BEFORE THE HOUSE COMMERCE COMMITTEE ON THE ECONOMICS OF THE KYOTO AGREEMENT MARCH 4, 1998

han  
kyou, 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 President's statement. The international agreement that was reached in Kyoto this past December is a crucial first step in addressing global climate change. But it is only a first step. 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, such as effective international emission trading arrangements, meaningful developing country participation, inclusion of land use activities that absorb carbon ("sinks"), and reliance on flexible, market based measures, that ensure that reductions in global greenhouse gas emissions are consistent

ntwithcontinuedstrongeconomicgrowth.Iwillexplainthereasoningunderlyingourconclusionthat,undertheseconditions,economicimpactsarelikelytobemodest.TheAdministrationisstronglycommittedtoensuringthatthesekeyelementsarereflectedinourdomesticandinternationalclimatechange policies. Wearefirmlycommittedtomeaningfuldevelopingcountry participation, theabilityofsinkstooffsetemissionsrequirementsandemissionstradingbothdomesticallyandinternationally. Andasyouknow, thePresident'sFY1999budgetincludesa\$6.3billionpackageoftaxcutsandR&Doverthenext5years; thispackage makesgood sense in terms of energy policy and will jumpstartourefforts. 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 offering modest reductions in greenhouse gas emissions. I. Basic Economic Rationale of the Kyoto Treaty H&" 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 Agreement. 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 pay 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 agreement 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 (CO<sub>2</sub>) is the most important: net cumulative CO<sub>2</sub> 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 4 If growing global emissions continue unabated, the atmospheric concentration of CO<sub>2</sub> will likely double relative to its preindustrial level by mid-way through the next century. As a result of the increased concentration of CO<sub>2</sub>, 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 latitudes than in the tropics, and greater over land than ocean. Many models predict greater surface warming of the land than of the sea in winter, and increased precipitation and soil moisture in high latitudes in winter. 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 X 44 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

y, 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 about 6,000 to 10,000 additional deaths per year from higher summer temperatures, even after netting out the effects of warmer winter and assuming acclimatization. Other researchers have predicted sea level increases of about 20 inches by 2100, with substantially greater increases in subsequent years.<sup>4</sup> Despite these difficulties, respected researchers have developed estimates of the monetary damages expected from an average world wide temperature increase. For example, Cline estimated that a temperature change of 4.5 degrees Fahrenheit would impose annual damages of more than \$70 billion per year on the U.S. economy in today's terms. These damages include \$22 billion in lost agricultural production, \$13 billion in additional electricity costs, and \$8 billion in new cost to maintain the existing supply of freshwater. (Cline's original estimates are quoted in 1990 dollars. The figures given above translated those numbers into 1997 dollars using the annual GDP price index.) William Nordhaus of Yale University has likewise computed estimates of the dollar loss attributable to a doubling of carbon dioxide concentrations. Although he uses methods that differ from Cline's in several respects, he finds that the Cline estimate is in the center of three estimates for the U.S., and that the highest estimate is only 30 percent greater than the lowest estimate. It must be noted, however, that this similarity among aggregate 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.<sup>4</sup> One key difficulty in interpreting and applying these estimates of monetary damages is uncertainty over the extent to which 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 may not fully reflect potential nonlinearities in the relationships between carbon dioxide 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 small and unknown possibility of large scale and potentially irreversible discrete events with potentially catastrophic consequences.<sup>4</sup> Two such possibilities serve as illustrations. Warming of Northern tundra may release very large amounts of methane from the subarctic permafrost, thereby leading to potentially devastating acceleration of an otherwise controllable global warming process. We do not know at what point, if any, such 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 displacement of the Gulf Stream that warms Western Europe. Evidence from ocean cores samples suggests such changes of ocean currents have occurred in previous ice ages.<sup>4</sup> To what extent are we willing to take such chances with our planet? There is a strong argument for the Kyoto agreement 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 quantifiable. Since human beings are typically aversive 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

<sup>4</sup> The cost 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 8' # 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** X 4 Climate change is a global problem requiring a global solution. As I mentioned 8 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 and 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 Agreement, 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: CO<sub>2</sub>, N<sub>2</sub>O, methane, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. These limits P 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 agreement, each industrial country's 1990 baseline is actually based on its 1990 emissions of CO<sub>2</sub>, methane, and N<sub>2</sub>O and its choice of 1990 or 1995 level of h\$ the other three categories of gases. The United States agreed to a target of 7 percent below the 1990 baseline by the period between 2008 and 2012. To meet that target, net U.S. emissions of greenhouse gases (all emissions minus removal of CO<sub>2</sub> by certain forestry-related activities 8' # must average no more than 1484 million metric tons of carbon equivalent per year during that period. XXXX Given the changes in the definition of the baseline for the three long-lived chemical )"% compounds (HFCs, PFCs and SF<sub>6</sub>) 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 only about 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. hXX (

XXh 4 The President has made clear that he will not submit the Kyoto agreement to the d 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

re for not provide adequate protection from climate change.<sup>4</sup> 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. Again, greenhouse gas emissions have the same basic impact on the climate regardless of where they occur. So reductions in developing countries have the same environmental benefits as reductions domestically. 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.<sup>4</sup> Third, principles of basic fairness suggest all countries should do their part, depending on their ability to contribute to the solution. Thus even poor countries should contribute, although the lack of resources in such countries may limit the extent of their contributions.<sup>4</sup> Some have expressed fear that the Kyoto agreement might adversely affect the competitive position of American industry. Evaluating how the Kyoto agreement could affect competitiveness of a few specific manufacturing industries especially those that are especially energy intensive, such as aluminum, paper, 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. Even electricity prices also vary significantly: in the U.S. they were 5 cents per kilowatt hour, much less than the prices in Switzerland of 13 cents per kilowatt hour. Swiss Yet U.S. industry is not moving en masse to Venezuela, nor is European industry moving to the United States. Third, roughly two thirds of all emissions are not in manufacturing at all, but in transportation and buildings. It therefore believe we need developing country participation more for the reasons outlined above, than to avoid adverse effects on competitiveness. hXXhh

XXhXXXX 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 achieve their objectives 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, 2,600 economists from academia, industry and government alike urged such approaches in a letter they signed last year advocating action on climate change:<sup>04</sup> 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 in some sense 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.<sup>4</sup> As a result of U.S. leadership, the Kyoto Protocol incorporates this principle of when flexibility in four ways: "04 First, the cuts to be made in the first period are less severe, and the first period ends (t)"% 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 \*T\$' such as those from prematurely scrapping coal fired electricity plants still in the prime +D%( of their operation

glives, while attaining the same ultimate environmental goals.

4(#4(# "04 Second, unde

r the Kyoto agreement, the emission target is not specified in terms of a h 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 bankin

g emission reductions within the 2008-2012

commitment period, for use in a subsequent comm

itment period [although the emission targets of the next period have 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 i

s what flexibility, along two dimensions. XXXX The first is X the inclusion in the agreement to 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 pollutant 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 p requires specific reductions for specific gases. Since a molecule of sulfur hexafluoride is 23,900 times more potent over 100 years than a molecule of CO<sub>2</sub>, it may be cheaper to achieve the same P environmental benefit by eliminating one molecular unit of SF<sub>6</sub> than nearly 24,000 units of CO<sub>2</sub>. @ 4 Some initial analysis indicates that a strategy of reducing non-CO<sub>2</sub> greenhouse gases " by more than 3 percent below their 1990/1995 baseline levels while reducing CO<sub>2</sub> by less than 3 x# percent below its 1990 level could reduce greenhouse gas emission permit prices by more than 10 percent. [Double check number] 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 CO<sub>2</sub> +%( at much lower costs than reducing emissions of greenhouse gases.

XXX X3. Where flexibility (international) 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 agreement, because of U.S. insistence and persistence, includes three important cost-saving provisions of this nature. "04 First, it provides for countries that take on binding targets, at present the industrial P countries, to trade rights to emit greenhouse gases with each other. This market in emission permits will ensure that emission 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.

4(#4(# "04 Second, the agreeeme

nt provides for joint implementation by Annex I countries. Thus 8 if one industrial country did not develop a program to trade permits internationally, U.S. firms could nonetheless implement projects abroad for which they could receive emissions reductions credits in the U.S.

4Third, 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.

4Detail of these provisions

will be discussed in negotiations in Buenos Aires later this year. Nonetheless, I believe that international trading of emission credits, joint implementation and the clean development mechanism are likely to 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 (SO<sub>2</sub>) program, which relies, among other things, on a system of tradeable permits to reduce emissions of SO<sub>2</sub> from electric utilities. The SO<sub>2</sub> program has been successful in several ways: a large number of utilities participate, SO<sub>2</sub> emissions and ambient concentrations have fallen and the cost of reducing emissions are considerably lower than originally forecast. As has been frequently noted, the average cost of SO<sub>2</sub> 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 SO<sub>2</sub>, are well below earlier estimates of around \$250 to \$350 per ton. Trading programs may not always bring cost savings as large as those achieved by the SO<sub>2</sub> program; trading programs will not always be accompanied by the discovery of much cheaper control strategies. However, the SO<sub>2</sub> 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 p #XXXXZt#IV. Difficulties of Economic Analysis of the Kyoto Agreement P

4Now 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 I wish to emphasize once again the inherent limitations to any such estimates. 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. 4The 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. Second are the inherent limitations of available models to analyze even short-term costs and benefits. And finally is a topic I 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 @ 4The Kyoto Agreement 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 will work, there is still much that we do not know. 4First, 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. 4Second, the details of a number of items primarily concerning international trading 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 last all-night session of the Kyoto talks. 4Finally, 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 there as on 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

e. 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 @ 4

4 In addition to these uncertainties about the details of the international effort to address climate change, I must also note 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 experts 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 judgment and economic intuition are also crucial. +%( Benefit of Averting Climate Change h 4 As I discuss above, it is evident that the benefits of averting climate change are potentially immense. But I have chosen not to try to quantify them in monetary terms, in light of the difficulties I have enumerated, including the quantitative uncertainty of these benefits, their timing and 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 Agreement`

4 In order to evaluate the likely net economic impact of the Kyoto Agreement, excluding the benefit of mitigating climate change itself, we have drawn upon a variety of tools 0 to as

sess the various possible costs and nonclimate benefits of the Administration's emissions reduction policy. To give away the punchline, my conclusion is as follows: 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. That 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, we have employed a broad set of economic tools to assess the Kyoto agreement. 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, metaanalyses including 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 my 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

emains 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.<sup>4</sup> 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 agreement 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, sinks, a possible trading arrangement that could include a subset of the Annex I countries and the Clean Development Fund. I 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.<sup>4</sup> Mindful of the limitations of any single model, we are eager to see features of the Kyoto agreement 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

4 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 highlights the importance of such flexible, market based mechanisms which are therefore reflected, at the President's insistence, in the Kyoto Agreement and our ongoing diplomatic strategy.<sup>4</sup> Within the Kyoto agreement, this means an insistence on international trading, joint implementation, 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 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.<sup>4</sup> 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 \$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 \$2,000 credit 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 XXXX \$2.7 billion over the next 5 years in additional research and development spending 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 cars that meet all applicable safety and environmental standards and get up to three times the fuel efficiency of today's cars. In FY 99, the combined proposal for PNGV is \$277 million, up from \$227 million appropriated in FY 98. Similar government industry efforts are proposed to develop more efficient diesel engines for both light trucks and heavy trucks.<sup>4</sup> A second responsible step entails industry by industry consultation to prepare emission reduction plans in key industrial sectors. The Administration will work

n 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. 4XXX X 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. 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 provisions to conserve energy and promote use and development of renewable energy sources will 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 8' # 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 would 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 trading among Annex I countries is likely to 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 is meant to capture aggregated resource costs to the U.S. economy, including the cost to domestic firms of purchasing emission permits from Russia and other countries where emission reduction may be cheaper than in the United States. Although these estimates reflect idealized international trading, with negligible transaction costs, the overall conclusion is clear. The dramatic reduction in costs available from Annex I trading within the SGM model cutting 0

th costs involved by half highlights why the President insisted that international trading be part of the Kyoto Agreement; and why its achievement by our negotiators in Kyoto was such an important accomplishment. Estimated reduction in costs from umbrella trading x H 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, Japan, 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. 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 costs to the U.S. Results that we have derived from various SGM simulations suggest that, relative to the situation " in which there is no trading at all, the umbrella would reduce costs by an estimated 60-75 percent, depending on whether the former Warsaw Pact countries fall within the umbrella. The h\$ Kyoto Protocol classifies these countries outside of the EU bubble for the first budget period 2008-2012. 4 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 even from the limited role that the developing countries have already agreed to: the Clean Dev

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 costs that result from trading among Annex I countries.<sup>4</sup> 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. The more developing countries that take on modest binding targets and trade in

international permit markets, the lower will be costs.<sup>4</sup> 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<sup>4</sup> The preceding discussion has emphasized the importance of trading arrangement 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, under instructions from the President and Vice President, 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 agreements specify that removal of CO<sub>2</sub> by sinks count toward meeting the target. The United States plants many trees every year, and would receive credit for this activity under the Protocol. Very preliminary estimates of the implications for the United States of the Kyoto provisions on sinks indicate that carbon sinks could comprise nearly 10% of total required emissions reductions. Decreasing the required emissions reduction by 10% would likely result in cost savings greater than 10%.

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<sup>4</sup> 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 reduce the costs of meeting the Kyoto target by much more than 10 percent, 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 amount of tree planting.) Because the quantitative uncertainty is so large, we do not yet have an estimate with which I feel comfortable. But we do know that the effect of fully modeling the Kyoto provision pertaining to sinks is likely to be both favorable and potentially large. Accounting for the role of improvements in energy efficiency<sup>4</sup> 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 far from 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 nonnet resource cost, or even some savings.

The National Academy of Sciences reached qualitatively similar conclusions in a 1992 report.<sup>4</sup> The President's FY 1999 budget, as I have noted, includes a \$6.3 billion package of tax cuts and R&D 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 percentage points would lead to declines in the permit price of approximately 40 percent.<sup>4</sup> Our justification for incorporating into our assessments such 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 There are many other reasons for faith in the ability of American ingenuity to offer solutions to the challenge of climate change. 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 would run on gasoline and double current fuel economy while reducing conventional air pollution emissions by 90 percent. The set of technological advances have been made possible through the efforts of the Partnership for New Generation Vehicles between the Administration and the U.S. auto companies and their suppliers.<sup>4</sup> Such progress may be replicated in other sectors. VCRs and TVs, even when off, consume about \$1 billion worth of electricity annually. EPA has established a partnership with major manufacturers that has a goal of achieving a 70% reduction in energy use, without sacrificing product quality, usefulness, or increasing costs. This partnership offers promise of substantial improvements in energy efficiency. Non-Climate Benefits H 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. Obviously, the costs of undertaking greenhouse gas emission reductions must be compared to the benefits. As I have indicated, for various reasons it is difficult to quantify the benefits from averting climate change itself. But the literature has emphasized that any relative price shift that proves necessary to reduce emissions should produce non-climate benefits in three areas: air pollution unrelated to climate change, traffic congestion, and highway accidents. These benefits are hard to quantify precisely but potentially significant: our rough estimates suggest that these three benefits could offset 1525% of any resource cost of the climate change policy. Synthesis " 4 A comprehensive economic evaluation of -` h4 X- the economic impact of the Kyoto agreement 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 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 agreement, will be modest relative to the value of the insurance against climate change we are purchasing. 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 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 detail 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, 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 non-climate 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 a missions 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 family's energy bill by between \$75 and \$125 per year in 2010, although such predictions will not be observable because they would be small relative to other energy price changes, and more than 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: these annual changes have averaged 3.8 percent. In addition, by 2008 to 2012, the projected 10 percent decline in electricity prices from the restructuring that is part of our climate change agenda would more than fully offset an energy price increase of the magnitude suggested by the previous model calculation, translating into an overall net reduction in energy prices in the U.S.

As highlighted earlier, estimates of the type that I am presenting are fraught with uncertainty. The estimate I just discussed is predicated 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 modelling community to test the robustness of these results. Preliminary comparisons of the SGM model to the few other models that have been adapted to reflect features of the Kyoto accord, suggest that its predictions concerning the impact of the Kyoto agreement on carbon permit prices are neither the most conservative nor the most optimistic of the models that have been developed. The prediction of the SGM model is 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, as I have explained repeatedly above, is the difficulty in coming up with a number to capture the monetary benefits. But I trust that nobody will lose sight of our ultimate objective: keeping our planet the hospitable home that we enjoy today. Effects on employment and aggregate output

So far I 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, I do not anticipate any significant aggregate effect. Some jobs could be lost in energy-intensive sectors, 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. The situation might be different if a large energy shock were to hit the economy with

thnowarning,ashappenedintheoilcrisisof1973-74,whenthe real money supply,output and employment all contracted sharply. In addition to hitting with nowarning, the oil shock 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 also be different if the policy were to be implemented inefficiently (by command-and-control style regulation of the sort put in place in the oil crisis) rather than efficiently (by market based mechanisms of the sort that the President has proposed to use).

VII. Conclusion ((!\$ In conclusion, the Kyoto Agreement and the President's general approach to climate change reflect the insight of economic analysis. The Kyoto Agreement 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, and then later with a market based system of tradeable permits to ensure that our objectives are achieved as efficiently as possible. Provided that we are successful in international negotiations including those at Buenos Aires, our overall conclusion is that the economic impact of the Protocol will be modest relative to the value of the insurance against climate change that the Kyoto agreement provides. The purpose of this testimony has been to explain the reasoning underlying this conclusion, which relies not only on the forecasts of individual models, any one of which has its own strengths and limitations, but also on a broad variety of additional analysis and assessment. I look forward to continuing to work with members of this Committee, as well as other interested parties, in further analyzing the Kyoto Agreement 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: Adele C. Morris ( CN=Adele C. Morris/OU=CEA/O=EOP [ CEA ] )

CREATION DATE/TIME:26-FEB-1998 08:45:05.00

SUBJECT: IPCC nominations are almost final

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:

I've given each of you a copy of our draft list of nominees for the IPCC. The most important list for economists is WGIII, which is towards the end of the handout. I think we have an exceptional talent pool.

Many of the nominations solicited by CEA appear in my handwriting, although some are from DOE. After discussions with various experts, I added a few extra names in areas that weren't properly covered by economists. The exact topic areas are not locked in because the lead author group will convene and reorganize the chapters and themselves.

The U.S. government nominees will be finalized by OSTP tomorrow, so if you are interested, please look over the list and let me know your suggested changes as soon as possible. Meanwhile, I'm completing all the necessary paperwork.

Adele

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:26-FEB-1998 14:11:20.00

SUBJECT: DRAFT: Possible answer to a question about variations in family expenditures

TO: Joseph E. Aldy ( CN=Joseph E. Aldy/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: JONATHAN.GRUBER ( JONATHAN.GRUBER @ MS01.DO.treas.sprint.com @ INET @ LNGTWY [ UNKNOWN ] )

READ:UNKNOWN

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

TEXT:

Let me know what you think about this before I try showing it to Gene.

Thanks.===== ATTACHMENT 1 =====

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D15]MAIL41691565H.026 to ASCII,

The following is a HEX DUMP:

**Q: You say that the impact on the average four-person family will amount to \$75 to \$125 per year in 2008-2012. But what about families with higher energy bills, or that live in colder climates? Couldn't the costs be much higher?**

**A:** First, I want to emphasize that those figures, which apply to expenditures a full decade from now, do 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.

Second, the \$75 to \$125 range does not reflect the benefits of addressing climate change. We must remember that we are purchasing an insurance policy against the potentially catastrophic losses should we allow climate change to continue unabated.

Third, we must also remember that many families will be eligible for 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.

Fourth, given those caveats, I would emphasize that I am not aware of dramatic variations in direct energy expenditures across regions or 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 nine major regions of the United States is 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.

[Background: Energy expenditures per capita vary from 9 percent below the national average in the Pacific region to 11 percent above the national average in the East South Central region. According to Treasury materials, the typical four-person family with income of \$25,000 had energy expenditures of \$2,242 per year in 1993 (check year); the typical family with income of \$40,000 had expenditures of \$2,570; and the typical family with income of \$60,000 had expenditures of \$2,970. Thus the income elasticity is approximately 0.3 or so. Even a family with income of \$100,000 would thus face an energy cost increase only about 50 percent -- or very

roughly \$50 -- more than the typical four-person family.]

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:27-FEB-1998 15:44:58.00

SUBJECT: New testimony and memo to Klain

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

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

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

TEXT:

You should note that in the new version of testimony cc'ed to you earlier the impact on the typical family is now \$70-\$110, not \$75-125. The impact of electricity restructuring is now \$90. Given the sensitivity on this subject, this might make some difference to Ron. Also, we should be sure that all of the documents remain consistent, especially the talking points/summary.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:27-FEB-1998 16:39:36.00

SUBJECT: DRAFT memo to Ron Klain

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

TO: Russell W. Horwitz ( CN=Russell W. Horwitz/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: Gene B. Sperling ( CN=Gene B. Sperling/OU=OPD/O=EOP @ EOP [ OPD ] )

READ:UNKNOWN

TEXT:

The attached reflects slightly updated numbers from CEA. WE NEED TO HAVE  
GENE READ IT AND GET IT TO RON, SO THAT RON HAS TIME TO SPEAK WITH THE VP  
IF NECESSARY. ===== ATTACHMENT 1 =====

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

TEXT:

Unable to convert ARMS\_EXT:[ATTACH.D12]MAIL40461675M.026 to ASCII,  
The following is a HEX DUMP:

**DRAFT**

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 \$70 and \$110 per year between 2008 and 2012.

The following factors may help to put the \$70 and \$110 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 \$20 decline and a \$20 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 \$105 and \$165 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 \$70-\$110 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.

# Withdrawal/Redaction Marker

## Clinton Library

| DOCUMENT NO.<br>AND TYPE | SUBJECT/TITLE                                                                                                           | DATE       | RESTRICTION |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------|------------|-------------|
| 001. email               | Michele Jolin to Jeffrey A Frankel, Rebecca M. Blank, and Janet L. Yellen at 18:33:10.00. Subject: Recruiting. (1 page) | 02/27/1998 | b(6)        |

### COLLECTION:

Clinton Presidential Records  
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### FOLDER TITLE:

[02/23/1998 - 02/27/1998]

2013-0723-F  
ab1275

### RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

Freedom of Information Act - [5 U.S.C. 552(b)]

P1 National Security Classified Information [(a)(1) of the PRA]  
P2 Relating to the appointment to Federal office [(a)(2) of the PRA]  
P3 Release would violate a Federal statute [(a)(3) of the PRA]  
P4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]  
P5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]  
P6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

b(1) National security classified information [(b)(1) of the FOIA]  
b(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]  
b(3) Release would violate a Federal statute [(b)(3) of the FOIA]  
b(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]  
b(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]  
b(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]  
b(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]  
b(9) Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA]

C. Closed in accordance with restrictions contained in donor's deed of gift.  
PRM. Personal record misfile defined in accordance with 44 U.S.C. 2201(3).  
RR. Document will be reviewed upon request.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME:27-FEB-1998 12:12:43.00

SUBJECT: Testimony--written and oral

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: 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

TEXT:  
Attached are my latest versions of the testimony and the oral testimony.===== ATTACHMENT  
1 =====  
ATT CREATION TIME/DATE: 0 00:00:00.00

TEXT:

**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 trading, meaningful developing country participation, the ability of sinks to offset emissions requirements, and the inclusion of six 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 about 6,000 to 10,000 additional deaths per year 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 substantially greater increases subsequently. 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 small and unknown possibility of large-scale and potentially irreversible discrete events with potentially catastrophic consequences, such as warming of the Northern tundra sufficient to release very large amounts of methane from the subarctic permafrost. Evaluations of such catastrophic risks are especially important in evaluating whether the benefits of a particular climate control policy justify the costs. There is thus a strong argument for the Kyoto Protocol as a form of planet insurance.

## **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 "what", "where", and "when" flexibility.

As a result of U.S. diplomatic efforts, all three forms of flexibility are broadly reflected in the Kyoto Protocol. The inclusion of all six greenhouse gases and certain sink activities that promote removal of carbon from the atmosphere provide substantial "what flexibility"--enabling trading across emissions reductions sources to lower the cost of meeting our target. 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 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. That small net premium, in effect, purchases a partial insurance policy against a serious environmental threat. As I explain in my written testimony, this conclusion is not entirely dependent on, but is fully consistent with, formal model results.

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 achieving 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.