

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 5-FEB-1998 10:44:16.00

SUBJECT: antidote to the letter from EPA

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

READ:UNKNOWN

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

READ:UNKNOWN

CC: 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:

See Randy's note below. Let's hold firm at 1.25, at least for now.

----- Forwarded by Jeffrey A. Frankel/CEA/EOP on 02/05/98

10:43 AM -----

Randall W. Lutter

02/05/98 10:37:34 AM

Record Type: Record

To: Mccartland.Al @ epamail.epa.gov @ INET @ LNGTWY

cc: Peter R. Orszag/OPD/EOP, Jeffrey A. Frankel/CEA/EOP

Subject: emissions reductions

The recent memo from David and David about the AEEI is inconsistent with my understanding of the state of knowledge about the cost-effectiveness of the CCTI \$6.3 billion. I believe that OMB and Treasury, during budget deliberations had no generally accepted estimate of the emissions reductions that might result, either eventually, or in the prior- to-2010 timeframe. Please call to explain EPA's conservative estimate that the CCTI can increase the annual improvement to at least 1.5%.

-RL

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Sandra F. Daigle (CN=Sandra F. Daigle/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 6-FEB-1998 10:54:51.00

SUBJECT: Janet's ERP Release Speech on Monday

TO: Zachary M. Candelario (CN=Zachary M. Candelario/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Susan P. Clements (CN=Susan P. Clements/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Steven N. Braun (CN=Steven N. Braun/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Sarah J. Reber (CN=Sarah J. Reber/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

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

TO: Rosalind V. Rasin (CN=Rosalind V. Rasin/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

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

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

TO: Melissa A. Clark (CN=Melissa A. Clark/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Mary Fibich (CN=Mary Fibich/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Mary E. Jones (CN=Mary E. Jones/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Mary A. Thomas (CN=Mary A. Thomas/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Mark R. Hopkins (CN=Mark R. Hopkins/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Mark N. Levine (CN=Mark N. Levine/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Mark C. Rainey (CN=Mark C. Rainey/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Maria J. Hanratty (CN=Maria J. Hanratty/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

TO: Linda A. Reilly (CN=Linda A. Reilly/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Lael Brainard (CN=Lael Brainard/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Kristen M. Scarafia (CN=Kristen M. Scarafia/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

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

TO: Jon D. Haveman (CN=Jon D. Haveman/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

TO: Jenny E. Pippin (CN=Jenny E. Pippin/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

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

TO: James M. Treadway (CN=James M. Treadway/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Ha Yan Lee (CN=Ha Yan Lee/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Francine P. Obermiller (CN=Francine P. Obermiller/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Daniel K. Chang (CN=Daniel K. Chang/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

TO: Christel M. Sice (CN=Christel M. Sice/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Charles F. Stone (CN=Charles F. Stone/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Catherine H. Furlong (CN=Catherine H. Furlong/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Carol L. Capece (CN=Carol L. Capece/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Brian A. Amorosi (CN=Brian A. Amorosi/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

TO: Amy N. Finkelstein (CN=Amy N. Finkelstein/OU=CEA/O=EOP [CEA])
READ:UNKNOWN

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

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

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

TEXT:

Michele asked me to convey an invitation from the Center for National Policy to CEA Staff to attend Janet's speech to the Center for National Policy on Tuesday, February 10 at noon. The speech will be given at the Grand Hyatt Hotel, 1000 H Street. Janet will speak about the Economic Report. Because lunch will be provided, they would need to have a FIRM count of staff who would like to attend as soon as possible. Please let me know if you would like to go by 2pm today.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 6-FEB-1998 11:04:53.00

SUBJECT: Suggested edits to testimony

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

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

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

TO: 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

TEXT:

1. After the written testimony is approved by the principals, we need to think about oral testimony -- which will have to be substantially shorter than (but can refer to) the written version.

2. I agree with Jon Gruber's suggestion that we should not quote specific carbon prices in the "benefits section" before we have given our bottom line on the permit price. His language looks good.

3. Don Kennedy suggests a slight change in the Gulf Stream language:
"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 core samples suggests such changes of ocean currents have occurred in previous ice ages."

4. In the competitiveness section -- which we need to flag for the principals -- I would add a European example in addition to the Venezuelan one. Gas prices in 1996 were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. The point would then be that our prices are a lot higher than in Venezuela, and a lot lower than in Europe, and yet U.S. firms are not generally migrating to Venezuela and European firms are not generally migrating to the U.S.

5. Under "Estimated reductions in costs from LDC participation," I would not refer to the CDM as a "moderate version of developing country participation" -- since that may raise the possibility of submitting the treaty for ratification with only the CDM as the meaningful LDC participation. I would substitute: "The substantial potential gains from

meaningful LDC participation are highlighted by the significant benefits that will likely accrue even from the limited role that the LDCs have already agreed to: the Clean Development Mechanism, modeled after JI..."

6. Under "Preliminary Estimate of the Net Effects of the Kyoto Agreement," I would highlight more the labor-intensive nature of the project:

"We can now combine the various benefits and costs delineated above to provide a preliminary assessment of the net impact of the Kyoto agreement, excluding, however, the benefits of averted damage from climate change. This assessment entails a very careful evaluation of results from the SGM model, as well as my own professional judgement and additional Administration analysis to match the results from the model with the institutional details of the Kyoto agreement. It accounts for the impact of trading under the umbrella, and assumes full participation by four key LDCs. The conclusion is that the resource costs of attaining our Kyoto targets for emission reductions are approximately \$7 to \$9 billion. Adding in the ancillary, non-climate benefits results in a net cost estimate of \$5 billion to \$8 billion, or roughly 0.08 percent of projected GDP."

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 6-FEB-1998 16:29:16.00

SUBJECT: OECD Ministerial

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

READ:UNKNOWN

TEXT:

John Weeks (at the U.S. OECD mission in Paris) rang yesterday to ask whether you would be attending the OECD Ministerial in April. John noted that one consideration that might militate your attending is that they will want to include comments on the Asian situation in the EPC chair's summary, and if you do not go, then Okita will be tapped to give the report in his capacity as vice-chair.

- Jeremy

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 6-FEB-1998 11:15:24.00

SUBJECT: Suggested edits to testimony

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

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

TEXT:

----- Forwarded by Janet L. Yellen/CEA/EOP on 02/06/98
11:15 AM -----

Peter R. Orszag
02/06/98 11:04:47 AM
Record Type: Record

To: See the distribution list at the bottom of this message
cc:
Subject: Suggested edits to testimony

1. After the written testimony is approved by the principals, we need to think about oral testimony -- which will have to be substantially shorter than (but can refer to) the written version.

2. I agree with Jon Gruber's suggestion that we should not quote specific carbon prices in the "benefits section" before we have given our bottom line on the permit price. His language looks good.

3. Don Kennedy suggests a slight change in the Gulf Stream language: "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 core samples suggests such changes of ocean currents have occurred in previous ice ages."

4. In the competitiveness section -- which we need to flag for the principals -- I would add a European example in addition to the Venezuelan one. Gas prices in 1996 were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. The point would then be that our prices are a lot higher than in Venezuela, and a lot lower than in Europe, and yet U.S. firms are not generally migrating to Venezuela and European firms are not generally migrating to the U.S.

5. Under "Estimated reductions in costs from LDC participation," I would

not refer to the CDM as a "moderate version of developing country participation" -- since that may raise the possibility of submitting the treaty for ratification with only the CDM as the meaningful LDC participation. I would substitute: "The substantial potential gains from meaningful LDC participation are highlighted by the significant benefits that will likely accrue even from the limited role that the LDCs have already agreed to: the Clean Development Mechanism, modeled after JI..."

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Message Sent

To: _____
Janet L. Yellen/CEA/EOP
Joseph E. Aldy/CEA/EOP
JONATHAN.GRUBER @ MS01.DO.treas.sprint.com @ INET @ LNGTWY
Jeffrey A. Frankel/CEA/EOP
Michele Jolin/CEA/EOP

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 6-FEB-1998 17:59:21.00

SUBJECT: draft with most of gruber's and orzag's comments

TO: Jeffrey A. Frankel (CN=Jeffrey A. Frankel/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: 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.D6]MAIL43037663V.026 to ASCII,
The following is a HEX DUMP:

**TESTIMONY OF DR. JANET YELLEN
CHAIR, COUNCIL OF ECONOMIC ADVISERS
BEFORE THE SENATE FOREIGN RELATIONS COMMITTEE
ON THE ECONOMICS OF THE KYOTO AGREEMENT
FEBRUARY 11, 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 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 more of a work-in-progress than a completely finished product, 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 global participation and reliance on flexible, market-based measures, that ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth. I will do my best also to provide some rough estimates of costs and benefits.

The Administration is strongly committed to ensuring that these critical elements are reflected in our domestic and international climate change policies. We are firmly committed to meaningful developing country participation, as well as 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 to jumpstart our efforts.

I. Basic Economic Rationale of the Kyoto Treaty

To begin our analysis, it may be worth stepping back and examining the larger question of the basic rationale, from an economist's perspective, for the Kyoto Agreement.

The earth's surface is warming from the accumulation of greenhouse gases from myriad sources worldwide. None of these emitters presently pays the cost to others of warming's adverse effects -- a classic externality in the language of economists. As a result of these distorted incentives, disruption of the Earth's climate is likely to proceed at an excessive pace and if left uncontrolled may pose substantial costs in terms of harm to commerce and the environment alike. The fundamental economic logic of the Kyoto agreement is thus that

without such an international agreement, individual nations will not have the proper incentives to address the threats from global climate change.

II. Costs of Climate Change

In evaluating efforts to mitigate global warming, the first step is to consider the costs that are likely if we fail to take any action -- for these costs provide the primary motivation for reducing greenhouse gas emissions.

The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that "the balance of evidence suggests that there is a discernible human influence on global climate." Current concentrations of carbon dioxide, methane, nitrous oxide, and the other so-called greenhouse gases have reached levels well above those of preindustrial times. Of these, carbon dioxide (CO₂) is the most important: net cumulative CO₂ emissions resulting from the burning of fossil fuels and deforestation account for about two-thirds of potential warming from changes in greenhouse gas concentrations related to human activity.

Climatic Impact

If growth in global emissions continues unabated, the atmospheric concentration of CO₂ will likely double relative to its preindustrial level by midway through the next century. As a result of the increased concentration of CO₂, the IPCC estimates that global temperatures will increase by between 2.5 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 larger increases in evaporation than in precipitation over midlatitude land areas, which would result in drier conditions in those regions, especially during summer in North America and Europe.

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 freshwater supplies, and damage to ecosystems and biodiversity.

Economic and Monetary Damages

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 forecasting 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, migration costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss).

A subject of great uncertainty and sensitivity is the "discount rate" that is applied to the benefits of averting future climate change. Such a discount rate is needed if the analysis is to be expressed in monetary terms, because a dollar today is not worth the same as a dollar tomorrow. And since the benefits of stemming future climate change accrue over not only decades but centuries, small changes in the discount rate can produce substantial changes in the results. But the precise discount rate that should be used to evaluate questions as important as the future climate of the planet remains a subject of intense debate. It is safe to say that there is, as of yet, no professional consensus on the issue.

A similar point concerns risk aversion. To what extent are we willing to take chances with our planet? The point applies particularly to catastrophe scenarios. Scientists have thought of many possible scenarios, most of which they are fortunately not yet prepared to pronounce as particularly likely based on current evidence, but which might be truly catastrophic for the planet if they were to occur. There is a strong argument for the Kyoto agreement as a form of planet insurance. But what numerical weight should one assign to these catastrophic risks? In other words, what is the value of the insurance policy? It is difficult for an economist, or anyone, to know.

Despite these shortcomings and potential problems, respected researchers have developed estimates of the monetary damages expected from an average worldwide temperature increase of approximately 4.5 degrees Fahrenheit (corresponding to, roughly, a doubling of pre-industrial carbon dioxide concentrations). For example, William Cline, then a Senior Fellow at the Institute for International Economics, estimated that such a temperature change 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. (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. He finds that the Cline estimate is in the center of three estimates for the U.S., and that the high estimate is only 1.3 times greater than the low estimate.

It must be noted, however, that this similarity of 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. In particular, the estimates may not fully reflect potential non-linearities 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 quantitative analyses do not, and cannot, accurately reflect the small and unknown possibility of large-scale and potentially irreversible discrete events with potentially catastrophic consequences.

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 core samples suggests such changes of ocean currents have occurred in previous ice ages. 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 averse to risk, such possibilities 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

The costs of unabated climate change may thus be difficult to quantify, but they are nonetheless real and provide the motivation for reducing greenhouse gas emissions. In taking action to reduce those emissions, economic analysis suggests that two elements are absolutely essential:

- The effort must be global, to address the global externality inherent in the nature of the problem.
- The effort must be flexible and market-based, to ensure that we achieve our objectives in the most efficient manner possible.

Need for Global Action

Climate change is a global problem requiring a global solution. As I mentioned earlier, no single country has an incentive to reduce emissions sufficiently to protect the global environment against climate change. Each has an economic incentive to “free ride” on the efforts of others. Even if the United States sharply reduced its emissions unilaterally, greenhouse gas emissions from all other countries would continue to grow, and the risks posed by climate change would not be significantly abated. It is important to emphasize that emissions of different gases anywhere in the world have very similar effects on global climate.

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. The first 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 a long-term objective of limiting greenhouse gas concentrations and encouraged the established 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.

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 take substantial steps to stabilize atmospheric concentrations of greenhouse gases. The Kyoto Agreement, which requires the advice and consent of the Senate, would place binding limits on industrial countries’ emissions of the six principal categories of greenhouse gases: CO₂, N₂O, methane, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. **These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries.**

Under the Kyoto agreement, each industrial country’s “1990 baseline” is actually based on its 1990 emissions of CO₂, methane, and N₂O and its choice of 1990 or 1995 levels of the other three categories of gases. The United States agreed to a target of 7 percent below 1990 levels by the period between 2008 and 2012. To meet that target, net U.S. emissions of greenhouse gases -- all emissions minus removals of CO₂ by certain forestry-related activities -- must average no more than 1,484 million metric tons of carbon equivalent per year during that period. 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.

The President has made clear that his support of the Kyoto Agreement is dependent on meaningful participation from key developing countries (who are not included in Annex I). The President has also made clear that he will not submit the treaty to the Senate without such participation.

There are several reasons why meaningful participation from developing countries is essential. First, developing countries are projected to contribute a majority of total emissions by 2030 under a continuation of business-as-usual. Without the participation of developing economies, emissions reductions by the industrialized countries will therefore not achieve necessary protection from climate change. Indeed, if developing countries do not participate in the international regime, their emissions could potentially increase by *more* than under their business-as-usual baselines. One mechanism for such an unintended consequence is as follows.

As Annex I countries comply with their targets, their demand for oil will fall, which will probably work to reduce the price of oil on world markets, and perhaps to encourage non-participating countries to use more oil and emit more carbon than they otherwise would have.

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 by U.S. companies domestically. 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 benefit 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.

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 existence of more pressing social needs in such countries will inevitably limit the magnitude of their contributions.

So far I have not mentioned the word "competitiveness." One of the difficulties in analyzing concerns related to competitiveness is that the term itself is used to mean many different things. I have seen at least one study that uses "loss of competitiveness" to refer to predictions of negative effects on the *aggregate* trade balance. As a professional economist, I do not accept the logic upon which that particular argument is predicated: the aggregate trade balance is determined by macroeconomic forces -- the difference between saving and investment -- and not by our environmental policies.

On the other hand, if competitiveness refers to adverse effects on a few specific manufacturing industries -- those that are especially energy-intensive, such as aluminum, paper, and chemicals -- the situation may be more complicated. It is difficult to undergo a significant 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 in Venezuela. Similarly, gas prices were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. 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. I therefore believe it more accurate to say that we need developing country participation for the reasons I outlined above, than to say that we need it to avoid adverse effects on competitiveness.

Flexibility and Market Mechanisms

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 problem 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, the 2,600 economists urged such approaches in a letter they signed last year advocating action on climate change:

"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."

1. "When flexibility" (timing)

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.

The Kyoto Protocol incorporates this principle of "when flexibility" in four ways:

- First, the cuts to be made in the first period are less severe, and the first period ends much later, than what had been proposed by many other countries, most notably the Europeans.

By adopting a gradual and credible path of reductions in the early years, we can greatly reduce costs such as those from prematurely scrapping coal-fired electricity plants still in the prime of their operating lives, while attaining the same ultimate environmental goals.

- Second, under the Kyoto agreement, the emissions target is not specified in terms of a specific year, but rather in terms of an average over a five-year period (2008-2012). Averaging over five years, instead of requiring countries to meet a specific target each year, can lower costs, especially given an uncertain future. The averaging can smooth out the effects of short-term events such as fluctuations in the business cycle and energy demand, or hard winters and hot summers that would increase energy use and emissions.
- Third, there is allowance for “banking” emission reductions within the 2008-2012 commitment period, for use in a subsequent commitment period [although the emission targets of the next period have not yet been specified].

2. “What flexibility” (gases and sinks)

The second type of flexibility is “what flexibility”, along two dimensions. The first is the inclusion in the agreement of all six greenhouse gases. Emissions of different kinds of gases, not just carbon dioxide, contribute to the greenhouse effect. Since the IPCC has developed conversion factors for all greenhouse gases by estimating their global warming potentials, reductions in emissions of one pollutant can be used to substitute for increases in emissions of another by an amount that has equivalent environmental effects. The Kyoto Protocol stipulates that countries with binding targets are expected to reduce their *total* greenhouse gas emissions by certain percentages, but does not require specific reductions for specific gases. Since a molecule of sulfur hexafluoride is 23,900 times more potent over 100 years than a molecule of CO₂, it may be cheaper to achieve the same environmental benefit by eliminating one molecular unit of SF₆ than nearly 24,000 units of CO₂.

Some initial rough analysis indicates that a strategy of reducing non-CO₂ greenhouse gases by *more* than 7 percent below their 1990/1995 baseline levels while reducing CO₂ by *less* than 7 percent below its 1990 level could reduce greenhouse gas emission permit prices by more than 10 percent. Thus allowing countries flexibility in what gases they reduce -- essentially trading emissions reductions across gases -- can help lower significantly the costs of meeting their targets.

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. Promoting such sinks through afforestation and reforestation may reduce atmospheric concentrations of CO₂ at much lower costs than reducing emissions of greenhouse gases.

3. "Where flexibility" (international)

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 includes two important cost-saving provisions of this nature. First, it provides for industrial countries to trade rights to emit greenhouse gases with each other. This market in emissions 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 -- lowering costs without affecting the level of environmental protection.

Second, 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. Details of these provisions will be worked out in negotiations in Buenos Aires later this year.

IV. Difficulties of Economic Analysis of Kyoto Agreement

Now that we have a Protocol -- even if it is not yet fully complete nor ready for the President's submission to the Senate -- it is possible to examine it in somewhat more detail from an economic perspective. But 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 results should be treated with substantial caution.

The difficulties associated with 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.

Uncertainties over Certain Provisions in International Effort to Combat Climate Change

The 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

don't know.

First, as is often the case in a legal document of the length and complexity of the Kyoto Protocol, there are some provisions that require further clarification and interpretation. Of particular concern here is the treatment of so-called sinks -- activities that affect the rate at which carbon is removed from the atmosphere and "sequestered," specifically by the planting of trees.

Second, the details of a number of items -- primarily concerning international trading and developing countries -- are the subject of further 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.

Finally, and most importantly, we have not yet negotiated international agreements to limit emissions beyond the 2012 window. The emission cuts agreed upon at Kyoto are only a first step on a long journey. The first step that we propose to take over the next 15 years is critical. But the reason it is critical is *not* that, by itself, it will solve the climate change problem -- emissions during any given decade are small compared to the cumulative concentrations in the atmosphere. Rather, the first step is critical because we can't take the second and third steps until we have taken the first. At the same time, any analysis is complicated by the lack of knowledge over what the subsequent steps will be.

Inherent Limitations of Models

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.

One area in which the uncertainty is particularly large is the pace of technological progress -- including diffusion of existing energy-efficient technologies, as well as research and development of new technologies -- and the extent to which the pace will accelerate in response to government programs. Economics does not offer a good understanding of how technological progress is determined, in part because it is the stuff of experimentation, brainstorming, genius, breakthroughs, perceptions and habits. Invention is largely determined by inspiration -- notwithstanding Edison, who assigned a 99 percent share to perspiration -- and inspiration, in my experience, is difficult to fit into mathematical formulae or economic models. Models and experts on climate change policy tend to have a wider range of disagreement on the speed with which technology can be changed and the scope for speeding the diffusion of existing

energy-efficient technologies than on any other single issue.

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 have enough policy detail to distinguish alternative ways of redistributing revenues that would result if emission permits were to be auctioned. Some are capable of showing short-term macroeconomic disequilibria. Some include a long-term “carbon cycle” model that can keep track of the accumulation of greenhouse gas concentrations in the atmosphere and their climatological effects. Some break down the rest of the world into regions and so can model international trade. No one model does everything, and therefore we must not rely blindly on the results of any one model or set of models. Professional judgement and economic intuition are also crucial.

Benefits of Averting Climate Change

As I discussed 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 for you, in light of the difficulties I have enumerated -- including the quantitative uncertainty of these benefits, and their timing and therefore the extreme sensitivity of the results to the chosen discount rate.

Instead, what I will do is draw upon a variety of sources in an attempt to add up the various possible costs and benefits of emissions policy *excluding* climate change. To give away the punch line, 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, *even before taking into account the benefits of averting climate change itself*. That small net premium excluding the benefits of mitigating climate change, in effect, purchases a partial insurance policy against a serious environmental threat.

V. Assessing the Kyoto Agreement

The existence of modeling difficulties means that the results from any model must be treated with caution. We have therefore employed a broad set of economic tools to assess the Kyoto agreement. We have drawn on the insights of a wide 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, and the staff-level Interagency Analytical Team effort last year. Other tools include simple relevant statistics, “meta-analyses” of existing models, historical and sectoral examples, and basic economic reasoning. Drawing on this broad array of analytical tools is crucial to an intelligent evaluation of the policy alternatives.

To my knowledge, as of December, no model -- whether used inside the government or not -- had been set up precisely to analyze the parameters of the agreement that was reached in Kyoto. Most model-builders outside the government tend to take as long as several years to incorporate changes in policy parameters into their models. And no model is currently designed to assess sinks, or all six greenhouse gases included in the treaty.

One of the leading models in the field is the Second Generation Model of Battelle Laboratories. 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 a starting point for a preliminary 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 and a possible Annex I trading scheme that could exclude the EU. I will share with you today some preliminary results of this analysis.

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. Much of this work will continue to go on outside the government. For example, we have had discussions with the Energy Modeling Forum, based at Stanford University. The EMF is a long-running exercise involving many of the leading climate models. We have given the EMF advice on how features of the Kyoto legal language can be translated into terms recognizable to an economist. Unfortunately, the Energy Modeling Forum believes that its members will need at least until mid-year to produce reliable results.

VI. Economic Analysis

With all of that as important background, let us now turn to the task at hand. As we do so, let me emphasize once again that the figures presented below do not incorporate the benefits of starting to mitigate climate change.

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 mechanisms are used. Our economic analysis highlighted the importance of such flexible, market-based mechanisms -- which are therefore reflected, at the President's insistence, in the Kyoto Agreement and our approach to the effort.

Within the Kyoto agreement, this means an insistence on international trading, joint implementation, and, ultimately, on full developing country participation. Domestically, this means that we implement any emissions reductions through a market-based system of *tradeable* emissions permits, which ensures that we achieve reductions wherever they are least expensive. But this also means taking serious and responsible steps in the short run to prepare us to meet our

obligations in the longer term.

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 credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles, a 15 percent credit (up to \$2,000) for purchases of rooftop solar equipment, a 20 percent credit (subject to a cap) for purchasing energy-efficient building equipment, a \$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 \$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 FY99, the combined proposal for PNGV is \$277 million, up from \$227 million appropriated in FY98. Similar government-industry efforts are proposed to develop more efficient diesel engines for both light trucks and heavy trucks. [ADD SOMETHING MORE ABOUT INDUSTRY-GOVERNMENT DIALOG. PERHAPS A CONCRETE EXAMPLE OF IDENTIFYING AN INDUSTRY REGULATION THAT COULD BE REMOVED.]

The second such 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. A reasonable overall estimate of the effects of adding federal electricity restructuring to the rest of the President's program to address climate change is to achieve the same environmental goals at a cost saving of roughly \$16 billion per year.

Estimated Reduction in Costs from Annex I Trading

In the language of the treaty, "Annex I," you will recall, is the set of countries that have agreed to take on binding limitations in emissions of greenhouse gases. Even without developing country participation -- which, again, the President has emphasized as essential before the treaty would be submitted for ratification -- costs would be reduced substantially by trading among the Annex I countries. To provide some indication of the possible efficiency improvements, Russia and the Ukraine consume six times as much energy per dollar of output as does the United States.

Estimates derived from the SGM model suggest 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 costs is meant to capture aggregate resource costs to the US economy, including the cost to domestic firms of purchasing emission permits from Russia and other countries where emission reductions are cheaper than in the United States. The dramatic reduction in costs available from Annex I trading within the SGM model -- cutting the costs involved by half -- highlights why the President insisted that international trading be part of the Kyoto Agreement.

Estimated reduction in costs from umbrella trading

One possibility that emerged in Kyoto, which none of us foresaw, was the idea that the United States might undertake trading with a subset of Annex I countries, dubbed the "umbrella," that would exclude the European Union. The initial list of proposed participants in the umbrella includes the United States, Australia, Canada, Japan, New Zealand and Russia, with strong indications of interest from some others. The motivation for this idea was that the Europeans have been reluctant to agree to the sort of international trading that we want (preferring that they achieve their goals collectively in a group of their own, called the "EU bubble").

It is too early to say whether the umbrella concept will in fact be accepted by the parties. But it is an important concept to consider, for three reasons. First, it is conceivable that it will be formally agreed to in future negotiations. Second, even if the final treaty does not explicitly include the umbrella, but rather allows trading among all signatories (as the United States has proposed all along), it is conceivable that umbrella countries will agree, outside the treaty, to trade only among themselves. Third, the aversion toward international trading that the Europeans have expressed suggests that they might refrain from making the trades to which they would be entitled -- which would mean that the umbrella would operate in practice, if not in formal international agreement.

The significance of the umbrella idea in the present context is that it has the potential to further reduce costs to the United States. The reason is that if the Europeans do not bid against us for the relatively abundant, low-cost opportunities to reduce emissions in Russia and Eastern Europe, then the price of emissions reductions will be even lower. 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 arrangement would reduce costs by an estimated 60-75 per cent, depending on whether the former Warsaw Pact countries are classed with the EU, or are instead assumed to fall within the umbrella.

Estimated reduction in costs from LDC participation

The next consideration is participation by developing countries. The President has said that he will not submit the treaty for ratification without such participation -- which would

further reduce the costs involved.

The substantial potential gains from meaningful LDC participation are highlighted by the significant benefits that will likely accrue even from the limited role that the LDCs have already agreed to: the Clean Development Mechanism, modeled after Joint Implementation (JI). JI cannot realistically be expected to yield all the gains of binding targets for developing countries, but it might shave costs by roughly another 20 to 25 percent from the reduced costs that result from trading among Annex I countries.

Another possibility is that we persuade some of the key developing countries that are the largest emitters to commit to targets, and allow us to buy emission reductions from those paths. We estimate that this could cut roughly 55 percent off the reduced costs that result from Annex I trading. [The four countries included in this particular estimate are China, India, Brazil and Korea.] Once these savings have been attained, the estimated reductions to US costs from persuading the rest of the developing world to go along with full commitments are relatively small.

A useful rough check on our estimate of the gains from international emissions trading can be obtained from other modeling efforts, notwithstanding that they are likely to be more distant approximations to the parameters of the Kyoto Treaty. Recent results from six leading models that participated in the Stanford Energy Modeling Forum show that worldwide permit trading would reduce the estimated costs -- defined as lost consumption -- of a full, long-term, global program to stabilize atmospheric concentrations at 550 ppmv by an average of 56 percent, although the results vary from model to model.

I offer these numbers because they show the potential effectiveness of trading in reducing costs dramatically. But it is important that I repeat three caveats: First, as always, there is a wide range of uncertainty around all these estimates. Second, they apply to an idealized version of trading, one that assumes no problems of enforcement or transactions costs. Third, it seems unlikely that we will convince all of our partners to agree in Buenos Aires to the most complete and cost-effective international trading arrangements. Nonetheless, despite these caveats, the numbers do show major savings even without getting the most optimistic case.

Moreover -- and I can't highlight this enough -- these cost-saving features are fundamental tenets of the U.S. position for ratifying the Kyoto Protocol. If we do not get very solid provisions for international emissions trading and 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 going into Buenos Aires.

VII. Non-Climate Benefits

The costs of undertaking greenhouse gas emission reductions must be compared to the benefits. As I have indicated, for various reasons our analysis does not quantify the benefits from averting climate change itself. But the relative price shifts that are necessary to reduce emissions should produce benefits in three areas: air pollution, traffic congestion, and highway accidents. These benefits are quantifiable. The magnitude of these projected benefits would vary with the permit price.

Reductions in carbon emissions also lead to reductions in emissions of pollutants that contribute to excess concentrations of fine particulate matter and low-level ozone. We estimate significant ancillary reductions of nitrogen oxides and other pollutants, and associated cost savings even for low carbon prices. These cost savings be even larger if carbon emissions reduction efforts could be carefully coordinated with the implementation of the national ambient air quality standards.

Traffic congestion hurts motorists by causing delays and inconvenience. More efficient pricing -- which recognizes the externalities involved -- should lead to reductions in congestion as motorists choose other means of travel, share rides, or even forgo less important trips. Vehicle use also leads to costly accidents and to highway injuries including fatalities. More efficient pricing will reduce use and create savings from reduced accidents and resultant mortality. The savings from reduced congestion and reduced accidents are significant, even with low carbon prices.

A variety of other benefits that are harder to quantify are likely to result from reductions in carbon emissions. With respect to transportation, reduced vehicle use will also reduce the cost of road repair and maintenance. Second, reduced coal use will lower mercury emissions. Finally, reduced energy use will also increase U.S. energy independence. Our inability to estimate these effects quantitatively does not imply that they are necessarily small or unimportant.

VIII. Preliminary Estimate of the Net Effects of the Kyoto Agreement

We can now combine the various benefits and costs delineated above to provide a preliminary assessment of the net impact of the Kyoto agreement, excluding, however, the benefits of averted damage from climate change. This assessment entails a very careful evaluation of results from the SGM model, as well as my own professional judgement and additional Administration analysis to match the results from the model with the institutional details of the Kyoto agreement. It accounts for the impact of trading under the umbrella, and assumes full participation by four key LDCs. The conclusion is that the resource costs of attaining our Kyoto targets for emission reductions are approximately \$7 to \$9 billion. Adding in the ancillary, non-climate benefits results in a net cost estimate of \$5 billion to \$8 billion, or

roughly 0.08 percent of projected GDP.

A more tangible measure of costs is the estimated effects on energy prices. Excluding the impact of electricity restructuring, our SGM-based estimate is that the price of emissions would be in the range \$12 to \$16 per ton of carbon equivalent -- and that energy prices at the household level would rise by about 3 percent under the Kyoto accord. Fuel oil prices would rise by about 6 percent, natural gas prices by 4 percent, gasoline prices by 3 percent, and electricity prices by 3 percent. The 3 percent increase in energy prices at the household level would raise the average family's energy bill by about \$75 per year.

These estimates do *not* mean that households' energy expenses will in fact be higher in 2010 than today, however. In the first place, energy prices fluctuate year-by-year for all sorts of reasons. They could go either up or down. But even if we leave out unpredictable fluctuations, the energy price declines from Federal electricity restructuring would be enough to offset the impact estimated above. By 2008-2012, the projected 10 percent decline in electricity prices from the restructuring that is part of our climate change agenda will mean a net reduction in electricity prices in the U.S., even accounting for the small increases noted above.

As highlighted earlier, estimates of the type that I am presenting are fraught with uncertainty. The estimate I just discussed was predicated on the developing country participation that we will insist upon in Buenos Aires as a condition for our ratifying the Kyoto Protocol, but which is not yet part of that Protocol. At the same time, the numbers I have cited are in several respects conservative: they leave out several factors, such as the role of sinks, that could further reduce costs. But before I bring these factors into the analysis, allow me to say a few words about macroeconomics.

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 no warning, as happened in the oil crisis of 1973-74, when the real money supply, output and employment all contracted sharply. In addition to hitting with no warning, the oil shocks of the 1970s also entailed large transfers from the U.S. and other oil-importing countries to OPEC, thus

depressing real income and spending in the former. A self-imposed shift in the relative price of carbon-intensive energy to address global climate change, on the other hand, need not entail such a transfer of purchasing power. Thus there are critical differences between the oil price shocks and the effort to reduce carbon emissions. Our reassuring conclusion regarding aggregate output might also be different if the policy were to be implemented inefficiently (by command-and-control style regulations of the sort put in place in that oil crisis) rather than efficiently (by market mechanisms of the sort that the President has proposed to use).

IX. The Foregoing Estimates Are Conservative Along Several Dimensions

I should emphasize that the estimates I have presented are conservative in the sense that they do not include three factors: the potential cost reductions resulting from the inclusion in the Kyoto treaty of carbon sinks, the potential payoffs to the President's technology or energy efficiency initiatives, or the benefits of mitigating climate change itself. The first omission, sinks, concerns a provision of the Kyoto Protocol that has received less attention than it merits. It is only *net* emissions -- emissions to the atmosphere minus sequestration -- that are to be reduced 7 percent below 1990 levels, not gross emissions. 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 provision on sinks indicates 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%.

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 half or more, 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, possibly through some version of the USDA's Conservation Reserve Program, for example.) But neither we nor other analysts are yet sure exactly how to interpret the legal language of the Protocol. 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 modelling the Kyoto provision pertaining to sinks is likely to be both favorable and large.

The estimates I have cited so far also make little allowance for the payoff to the President's \$6.3 billion Climate Change Technology Initiative. The parameter that figures most prominently in analysis of technological progress in the energy field 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. In the SGM model analysis that underlies our assessment, the AEEI is assumed to improve by 1.0 percent per year. Reflecting a conservative interpretation of the 15-year impact of the technology initiative, this is only a small increase above the 0.9 percent number in the Energy Information Administration's Annual Energy Outlook.

Our justification for incorporating into our assessment 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 have conservatively assumed that there will be substantial lags in producing payoffs from new technology research and dissemination expenditures.

Clearly, this is neither the best outcome the Nation *can* attain nor the best outcome the Administration *expects* to attain as a consequence of our climate change strategy over the next decade. Many energy technology experts forecast more rapid technological progress; and engineering models suggest that some energy improving technologies are available now at negative costs.

If the Administration is successful in speeding the discovery and adoption of new technologies, 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 improvement suggest an increase in the AEEI from 1.0 to 1.25 would be reflected in about a 40% decrease in the permit price.

Our preliminary estimates do not fully reflect potential entrepreneurial response to appropriate incentives. An instructive example of the ability of U.S. industry to perform beyond expectations when given appropriate economic incentives is EPA's highly acclaimed sulfur dioxide (SO₂) program, which relies, among other things, on a system of tradeable permits to reduce emissions of SO₂ from electric utilities. The SO₂ program has been successful in several ways: a large number of utilities participate, SO₂ emissions and ambient concentrations have fallen and the costs of reducing emissions are considerably lower than originally forecast.

As has been frequently noted, the average cost of SO₂ emissions reductions has recently been significantly lower than was originally forecast, in part due to the role of incentives in fostering innovation. Emission permit prices, currently at approximately \$100 per ton of SO₂, are well below earlier estimates of around \$250 to \$350 per ton.

Trading programs may not always bring cost savings as large as those achieved by the SO₂ program; trading programs will not always be accompanied by the discovery of much cheaper control strategies. However, the SO₂ experience demonstrates clearly how programs that offer important market incentives to find cheaper ways of reducing emissions can lead to unexpectedly low prices.

The final, and most important factor that has been left out of the estimates I have

presented 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.

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.

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.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

CREATOR: Steven N. Braun (CN=Steven N. Braun/OU=CEA/O=EOP [CEA])

CREATION DATE/TIME: 6-FEB-1998 13:07:49.00

SUBJECT: Lingering Questions about CEA nonparticipation at the STEP meeting

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

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

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

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

CC: Steven N. Braun (CN=Steven N. Braun/OU=CEA/O=EOP @ EOP [CEA])
READ:UNKNOWN

TEXT:

Our decision not to attend begs the question of how the U.S. will be represented at the STEP meeting (scheduled for March 19-20). As the last delegate to this meeting, and as a former staffer at the OECD, I feel some personal responsibility for getting this issue resolved. (But should I stop worrying about it?) I recently spoke with Stan Otto at the US mission to the OECD about this question. Several possibilities come to mind:

1) The U.S. would not send anyone to speak for the Administration. (I received calls from Dick Freeman at the Fed expressing concern over whether they would be called upon to answer for the administration forecast and U.S economic conditions--and whether it would be proper to do so. The Fed is also wondering whether it is proper for them to attend when we cannot afford to.)

2) The CEA remains responsible for writing a briefing to be delivered by the permanent staff at the U.S. delegation. But who would then answer the questions? One possibility is for the permanent delegation to answer the questions that they can--and to punt on the rest; another is to use a telephone hookup so that I could answer questions from my office.

3) Another U.S. government agency could replace the CEA as leader of the delegation. (But does this harm the CEA's leadership with respect to relations with the OECD?) I was with Jeff when he asked David Wilcox about sending people from the Treasury's Economic Policy branch. David promised to think about it, but said that he doubted whether his travel budget --which is even more limited than ours--could accommodate these trips.

The OMB (also a member of the TROIKA) also is qualified for this

mission. Should they be asked? and who should ask them? The Commerce Department is a third possibility as that department sometimes participates in T3 meetings (although Commerce has been absent during the past 2 rounds).

4) The Secretariat has been considering an electronic format for the STEP meeting. Do we wish to argue for this format? --and would/should our nonparticipation at the March meeting be construed as a strong vote for the electronic format?

By the way does anyone know whether travel funding for the State Department's International Organization Unit was proposed by the Administration in the FY 1999 budget? Obviously this is relevant to the decisions outlined above.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 6-FEB-1998 18:50:18.00

SUBJECT: CNP speech

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

READ:UNKNOWN

TEXT:

Attached is the draft.

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

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

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D52]MAIL41153763H.026 to ASCII,
The following is a HEX DUMP:

The 1998 Economic Report of the President

Dr. Janet Yellen
Chairman, President's Council of Economic Advisers
Center for National Policy
February 10, 1998

Thank you. It is a pleasure to be here. I want to thank the Center for National Policy for again hosting the release of the annual *Economic Report of the President*. In particular, I want to thank Mo Steinbruner and Mike Pietro (pronounced "Pee-tro") for all of their help in arranging the event.

I would also like to thank my colleagues--Jeff Frankel and Becky Blank--for all their hard work and dedication in producing this year's *Report*.

Finally, I want to thank the staff of the Council, many of whom are here with us today. During the past several months, the staff have been working long nights and weekends to produce the Economic Report. And, because the other work of the Council doesn't disappear, they are in effect working two jobs with two shifts. I appreciate all of their hard work, their thoughtful insights and their good spirits. Their dedication and professionalism do deserve special recognition.

As you probably know, the Employment Act of 1946, which created the Council of Economic Advisers, requires the President to submit an Economic Report to the Congress each year. The Employment Act, together with its later amendments, gave the Federal government responsibility for stabilizing short-run economic fluctuations, promoting balanced and

noninflationary economic growth, and fostering low unemployment. One purpose of the Economic Report is to tell Congress whether we have met those responsibilities. I am happy to say, in this the fifty-second year after the Act, that the state of the economy is truly extraordinary.

I will elaborate on this point in a moment, but I would also like to note that the Report of the Council of Economic Advisers, has also traditionally been a vehicle for presenting a broad range of analyses of current economic policy issues. This year, in addition to a chapter on macroeconomic policy and performance, the Report contains a chapter on the economic well-being of families and children, and a chapter on racial and ethnic inequality--two central concerns of this Administration. The report also contains two chapters on microeconomic topics, one focusing on improving economic efficiency in the areas of health and environmental policy, and one discussing recent trends in antitrust policy. Finally, the international chapter focuses on the benefits of opening international markets.

In the remainder of my remarks I will touch briefly on the current state of the economy, and then discuss the broad and lasting benefits of a "high-employment economy" -- which is one of the key themes of this year's Economic Report. I will then talk about some of the key challenges that still face our nation as we move into the 21st Century.

STATE OF THE ECONOMY

Our Nation's economy is the strongest it has been in a generation. In 1997, growth was

strong and job creation was vigorous while inflation declined. Real GDP grew 3.9 percent, and employment rose by 3.2 million, for an average rate of 267,000 jobs per month. The unemployment rate dropped below 5 percent for the first time in 24 years, yet core inflation rose just 2.2 percent. And, this occurred during a period of historic deficit reduction: the Federal budget deficit, which reached \$290 billion in the 1992 fiscal year, declined to only \$22 billion in fiscal 1997. And, as you know, the President recently submitted to Congress a budget for fiscal 1999 that projects a balanced budget for the first time since 1969.

As 1998 begins, the prospects for continued growth with high employment and low inflation are excellent. The economy is remarkably free of the symptoms that often presage an economic downturn -- that is, there are no signs of inflationary pressures, sales remain strong so inventories are not accumulating, and there is no evidence of financial imbalances. Our economy is in fundamentally sound shape and well-equipped to handle any unexpected bouts of rougher weather.

THE BENEFITS OF A HIGH EMPLOYMENT ECONOMY

The exceptionally strong economy that we are enjoying today is due in part to the sound and credible economic strategy put in place by the Clinton Administration. The Administration's strategy has focused on getting the fundamentals right -- reducing the budget deficit, investing in the American people, and opening markets at home and abroad. These were the right policies to stimulate the job creation needed to move the economy to full employment. And, they are the right policies for attacking the longer term problems of sluggish

productivity growth and widening income inequality that had afflicted our nation's economy since the early 1970s.

There are enormous economic and social benefits to a "high-employment economy." An economy with strong job creation and low unemployment makes broad and lasting changes in our labor market and in the well-being of the American people. Let me talk briefly about some of these benefits:

First, a high employment economy produces certain *direct and measurable benefits*. Returning the economy to full employment yields a direct and measurable benefit to our nation by ensuring that the economy's resources--human and material--are not squandered by needless cyclical unemployment. On average, reducing the unemployment rate by a percentage point raises output by approximately 2 percent; in 1997, 2 percent of GDP was \$160 billion, or roughly \$600 for every American man, woman, and child. Wasted resources from not producing at potential, together with the human cost of unemployment, are intolerable; the elimination of this waste is the principal benefit of a sustained return to full employment.

Second, a high-employment economy can *reduce long-term joblessness*. A tight labor market encourages participation by those who might otherwise be forced to sit on the sidelines, and makes it easier to absorb less skilled or younger and more inexperienced workers into the labor force. These new labor market entrants gain much-needed job experience, building the

skills they will need to hold down a job in the future. The experience of some European countries illustrates this point: in Europe, the prolonged stagnation or recession may have led to a permanent increase in unemployment there, as the unemployed and the never-employed have seen their skills atrophy or become obsolete. For this reason, running a high-employment economy, may be one of the surest ways to ensure that an unacceptably large fraction of our citizens are not consigned to long-term joblessness and economic marginalization.

Third, it will *help move welfare recipients into the workforce*. Keeping the unemployment rate low and job growth high is necessary if we are to move current welfare recipients into the work force. Early, indirect evidence on this point is encouraging: employment and labor force participation rates among single women who maintain families--about two-thirds of whom have children under 18--have increased in the past few years. This is probably in part the result of recent welfare reform: the greatest acceleration in employment rates has occurred among those single women most likely to be affected by welfare reform, namely, those with young children. Nevertheless, it is obvious that fostering an economy in which job opportunities are plentiful plays a crucial part in aiding the transition from welfare to work.

Fourth, it *enhances personal economic security*. Knowing that work is available to those who seek it, at wages sufficient to keep them and their families out of poverty, is a key to personal economic security. A tight labor market increases the confidence of job losers that they will be able to return to work, lures discouraged workers back into the labor force, enhances the prospects of those already at work to get ahead, enables those who want or need to switch jobs to do so without a long period of joblessness, and lowers the duration of a typical unemployment

spell.

And, finally, a high-employment economy *may help reverse the trend toward greater economic inequality*. From the 1980s until the early 1990s, the economy's ability to reduce poverty through growth alone was hampered by a strong headwind: for the poorest Americans, the benefits of an expanding economy were offset by the sustained declines in wages at the low end of the earnings distribution. Since 1993, living standards for all Americans are on the rise, especially for those at the bottom of the income distribution. The poverty rate fell to 13.7 percent in 1996, from 15.1 percent in 1993; the poverty rate for black Americans is at a historical low, and in 1997 unemployment among blacks fell to its lowest rate since 1973. Since 1993, household income has grown in each quintile of the income distribution, with the largest percentage increase going to the poorest members of our society. Maintaining a full-employment economy is essential if this progress is to continue.

CHALLENGES IN A CHANGING ECONOMY

Yes, our economy is strong and Americans are working in record numbers. And there are broad and lasting benefits to sustaining a healthy economy with strong job creation and low unemployment.

But our Nation still faces other, broader challenges as we move into the 21st century. In many ways the U.S. economy today is very different from that in which our parents and grandparents lived and worked. Today, 24 percent of families are headed by a single parent, compared with 14 percent 25 years ago. Three in five married mothers with children under 6 are in the work force--twice as large a share as in 1970. And the U.S. population is aging-- in the next century there will be fewer workers for every retiree, making issues related to retirement security more and more important. The nature of the workplace also has changed significantly: few American workers expect to be working for the same employer--or even to be in the same career--when they retire. Information technology is dominating industry: in the 1950s the information technology industry barely existed; today it employs a larger share of the labor force than the automobile industry did in the 1950s and 1960s. Because information and technology and global commerce are leading the transformation of the global economy, the new strength of a nation will be found in the skills, knowledge and imagination of its people.

The Clinton Administration's agenda is designed to deal with these changes and the challenges they pose. It is designed to equip the American people with the strength, the skills, the security and the flexibility needed to reap the rewards of our growing, changing economy. The President recently laid out this broad agenda in his State of the Union and again in his FY1999 budget. In the remainder of my remarks, I will focus on 3 of the key agenda areas: retirement security, the challenges of childcare and racial and ethnic economic inequality.

First, let me talk about issues related to the aging of the population, which we address in Chapter 1 of the *Economic Report* -- reforming Social Security.

For almost 60 years, Social Security has provided Americans with income security in retirement and protection against loss of family income due to disability or death. A large share of elderly Americans, particularly those with low incomes, rely on Social Security as their primary source of pension income in retirement. The system has enjoyed dramatic success in reducing poverty rates among older Americans.

Today, however, many Americans fear that Social Security will not be there for them when they are ready to retire. This concern reflects the widespread recognition that, under current “intermediate” projections of the Social Security trustees, the system faces a long-term funding gap: beginning in 2012, unless the system is reformed by then, the government will be unable to pay current Social Security benefits in full out of current payroll taxes; it will then have to draw down the system's trust fund, and by 2029 those funds will be exhausted. If still nothing has been done, the government would then face several options which it could adopt singly or in combination: it could reduce benefits until they are in line with collections, raise payroll taxes to cover an unchanged level of benefits, or finance the shortfall from other parts of the budget, by raising other taxes, cutting expenditures on other programs, or borrowing and allowing the budget deficit to increase. One or more of these measures will have to be taken so long as no changes are made to the present system.

Although the seriousness of the financial imbalance facing Social Security should not be downplayed, its magnitude is not so large as to be insurmountable, particularly if early action is taken. For example, even if nothing is done and the trust fund is exhausted, payroll taxes will still be sufficient to permanently finance roughly 75 percent of benefits. Put another way, the

difference between the anticipated income and the anticipated expenditures of the OASDI (Old Age, Survivors', and Disability Insurance) program over the next 75 years amounts to around 2¼ percentage points of taxable payroll, or approximately 1 percent of GDP. These facts suggest that the problem of placing Social Security on a sound financial footing can admit of eventual resolution.

The President is committed to Saving Social Security First. He has proposed reserving 100 percent of any budget surplus until steps have been taken to reform Social Security. He has also proposed a process to devise an appropriate solution over the next 2 years.

A second major policy challenge involves children and issues related to childcare.

Chapter 3 of this year's *Report* notes that there have been notable improvements in children's well-being over the past three years. While too many children are still living in poverty, the official child poverty rate has fallen by 2.2 percentage points since 1993. And, under a broader measure of poverty which includes both taxes (like the EITC) and non-medical in-kind benefits, the poverty rate for children has decreased by 4.7 percentage points from 1993 to 1996, and is now below its level in 1989. The primary reason for this drop is because more families were able to earn enough money to bring their incomes above the poverty line.

The share of children living in households without enough to eat has also fallen, as has the share of households with children living in housing in poor physical condition. There have also been increases in children's utilization of basic health care services, and continued

improvements in mortality rates of infants and young children.

Despite these improvements, many children remain economically vulnerable. One in five children, and nearly one in two children in female-headed families, had incomes below the poverty level in 1996. One in seven children did not have access to health insurance in 1996, and one in nine lived in households which paid more than half their income for housing in 1995. Finally, a large share of children fail to achieve even a basic levels of proficiency in science, mathematics, and reading.

For this reason, the President has developed a number of initiatives to strengthen the economic and social supports for America's children. This year, the Administration has begun to implement the Children's Health Insurance Program, which offers \$24 billion over five years to States to expand health insurance for uninsured children. For fiscal 1999, the President has proposed to expand the supply of affordable housing for low-income families, through a 40% increase in the low-income housing tax credit, and through continued expansions in the HOME Investments Partnership Program. The President has also proposed two major new initiatives to improve the quality of elementary and secondary education. The first would invest \$12.4 billion over 7 years to bring down class sizes in public schools in grades 1 to 3 from a nationwide average of 22 pupils in to an average of 18. The second would provide tax credits to pay interest on nearly in \$22 billion in bonds to support new construction and renovation of public school buildings.

Today, more American workers are faced with the need to juggle the demands of the

workplace with the demands of family and home. In 1997, over 60 percent of married mothers with a child under six were working--compared to 30 percent twenty years ago. For most of these families, it is difficult to afford high quality day care. In 1993, child care expenditures represented 25 percent of annual income for those families with annual incomes below \$14,400 with employed mothers and preschool children in paid care. Comparable families with annual incomes above \$54,000 spent only 6 percent of their income on child care. There is also reason to be concerned about the quality of child care: A recent study of regulated child care providers found that 86 percent of child care centers surveyed provided mediocre or poor care when judged from the perspective of child development, and 12 percent were of such poor quality that the children's health and safety needs were only partly met.

The President's 1999 budget includes a \$21 billion increase in funding for child care, to make it accessible to more families and to raise its quality. An important part of this proposal is increased tax credits for 3 million working families to help them pay for child care, as well as an increase in block grants to States that will directly subsidize child care for low-income families. In addition, the proposal calls for a new Early Learning Fund, along with support for the enforcement of State child care health and safety standards, scholarships for up to 50,000 child care providers per year, and funding for research and consumer education. Finally, the proposal includes \$3.8 billion in additional funding over 5 years to help to reach the goal of expanding participation in Head Start to 1 million children in 2002.

Finally, I'd like to talk about issues related to the progress of different race and ethnic groups. Chapter 4 of the *Economic Report* reviews trends in racial and ethnic economic

inequality and concludes that this country's longstanding goal of achieving racial equality has not yet been attained. Although there has been progress in narrowing economic gaps among racial and ethnic groups in the postwar period, it has been very uneven, with rapid progress in the 1960s and early 1970s, followed by 20 years of stagnation between the early to mid-1970s to the early 1990s.

Although the current expansion has brought signs of renewed progress, substantial disparities in economic status across racial and ethnic groups persist. For example, income gaps between black and white families are as large today as they were 30 years ago. Since the mid-1970s the wages of young black college graduates have fallen relative to those of their white counterparts. And, the median wealth of white families is by some estimates 10 times that of black and Hispanic families.

Clearly, more needs to be done to promote equality of opportunity for all Americans. Many of the Administration's current and proposed policies, such as those that encourage community empowerment and education are intended to address these disparities. Furthermore, the Administration's 1999 budget proposal signals a renewed federal commitment to strong and effective enforcement of the Nation's civil rights laws. It increases funding for federal civil rights enforcement agencies by more than 16 percent. And, this January, in a Martin Luther King Day address, Vice President Gore announced the Administration's package of proposed civil rights enforcement initiatives. In addition to increasing funding, these initiatives place greater emphasis on the nonlitigation and prevention remedies for discrimination, and provide for better coordination across Federal agencies and offices. The President has also initiated and devoted

great energy and resources to his Initiative on Race, an effort to further a national dialogue on race in America.

CONCLUSION

Let me conclude by saying that over the past year the performance of the U.S. economy has been extraordinary: strong growth and low unemployment combined with low and stable inflation. And there are enormous social and economic benefits to our high-employment economy. But that success--and the economy's present strength--cannot be taken for granted. Rather, there are still long-term changes and challenges facing our nation as we enter the 21st Century. The Clinton Administration has an agenda for helping to equip the American people with the skills and flexibility and security to take advantages of the opportunities and possibilities in this new economic era. We must finish the job of balancing the budget while investing in people and opening markets at home and abroad. At the same time, we must ensure that all Americans, regardless of age or origin, have the skills they need to prosper in a world of change and opportunity.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 8-FEB-1998 18:25:46.00

SUBJECT: ERP Press statement

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.D57]MAIL42707683B.026 to ASCII,
The following is a HEX DUMP:

STATEMENT OF JANET YELLEN

Thank you all for coming in today to hear about the 1998 Economic Report of the President.

As you know, Congress requires the President to submit each year a Report that describes the state of the US economy. But, the *Report* has also traditionally been a vehicle for presenting a broad range of analyses of current economic policy issues. This year, in addition to a chapter on macroeconomic policy and performance, the *Report* contains a chapter on the economic well-being of families and children, and a chapter on racial and ethnic inequality--two central concerns of this Administration. The report also contains two chapters on microeconomic topics, one focusing on improving economic efficiency in the areas of health and environmental policy, and one discussing recent trends in antitrust policy. Finally, it includes an international chapter, which focuses on the benefits of opening international markets.

Let me first touch briefly on the current state of the economy, and then discuss the broad and lasting benefits of a "high-employment economy" -- which is one of the key themes of this year's *Economic Report*. I will then talk specifically about the Chapters on Race and Children.

STATE OF THE ECONOMY

Our Nation's economy is the strongest it has been in a generation. In 1997, growth was strong and job creation was vigorous while inflation declined. Real GDP grew 3.9 percent, and employment rose by 3.2 million, for an average rate of 267,000 jobs per month. The unemployment rate dropped below 5 percent for the first time in 24 years, yet core inflation rose just 2.2 percent.

As 1998 begins, the prospects for continued growth with high employment and low inflation are excellent. The economy is remarkably free of the symptoms that often presage an economic downturn. Our economy is in fundamentally sound shape and well-equipped to handle any unexpected bouts of rougher weather.

THE BENEFITS OF A HIGH EMPLOYMENT ECONOMY

The exceptionally strong economy that we are enjoying today is due in part to the sound and credible economic strategy put in place by the Clinton Administration. The Administration's strategy has focused on getting the fundamentals right -- reducing the budget deficit, investing in the American people, and opening markets at home and abroad. These were the right policies to stimulate the job creation needed to move the economy to full employment.

There are enormous economic and social benefits to a “high-employment economy.” And, this is one of the key themes of this year’s *Economic Report*. In the *Report*, we describe how an economy with strong job creation and low unemployment makes broad and lasting changes in our labor market and in the well-being of the American people. Let me talk briefly about some of these benefits:

First, a high employment economy produces certain *direct and measurable benefits*. Returning the economy to full employment yields a direct and measurable benefit to our nation by ensuring that the economy’s resources--human and material--are not wasted by needless cyclical unemployment. On average, reducing the unemployment rate by a percentage point raises output by approximately 2 percent; in 1997, 2 percent of GDP was \$160 billion, or roughly \$600 for every American man, woman, and child. Wasted resources from not producing at potential, together with the human cost of unemployment, are intolerable; the elimination of this waste is the principal benefit of a sustained return to full employment.

Second, a high-employment economy can *reduce long-term joblessness*. A tight labor market encourages participation by those who might otherwise be forced to sit on the sidelines, and makes it easier to absorb less skilled or younger and more inexperienced workers into the labor force. These new labor market entrants gain much-needed job experience, building the skills they will need to hold down a job in the future. For this reason, running a high-employment economy, is one of the best ways to ensure that an unacceptably large fraction of our citizens are not consigned to long-term joblessness and economic marginalization.

Third, a high-employment economy will *help move welfare recipients into the workforce*.

Keeping the unemployment rate low and job growth high is necessary if we are to move current welfare recipients into the work force. Early, indirect evidence on this point is encouraging: employment and labor force participation rates among single women who maintain families--about two-thirds of whom have children under 18--have increased in the past few years. This is probably in part the result of recent welfare reform: the greatest acceleration in employment rates has occurred among those single women most likely to be affected by welfare reform, namely, those with young children. Nevertheless, it is obvious that fostering an economy in which job opportunities are plentiful plays a crucial part in aiding the transition from welfare to work.

Fourth, a high-employment economy *enhances personal economic security*. Knowing that work is available to those who seek it, at wages sufficient to keep them and their families out of poverty, is a key to personal economic security. A tight labor market increases the confidence of job losers that they will be able to return to work, lures discouraged workers back into the labor force, enhances the prospects of those already at work to get ahead, enables those who want or need to switch jobs to do so without a long period of joblessness, and lowers the duration of a typical unemployment spell.

And, finally, a high-employment economy *may help reverse the trend toward greater economic inequality*. From the 1980s until the early 1990s, the benefits of an expanding economy were offset by the sustained declines in wages at the low end of the earnings

distribution. Since 1993, living standards for all Americans are on the rise, especially for those at the bottom of the income distribution. The poverty rate fell to 13.7 percent in 1996, from 15.1 percent in 1993; the poverty rate for black Americans is at a historical low, and in 1997 unemployment among blacks fell to its lowest rate since 1973. Since 1993, household income has grown in each quintile of the income distribution, with the largest percentage increase going to the poorest members of our society. Maintaining a full-employment economy is essential if this progress is to continue.

CHALLENGES IN A CHANGING ECONOMY

Yes, our economy is strong and Americans are working in record numbers. And there are broad and lasting benefits to sustaining a healthy economy with strong job creation and low unemployment.

But our Nation still faces other, broader challenges as we move into the 21st century. The Clinton Administration's agenda is designed to deal with these changes and the challenges they pose. It is designed to equip the American people with the strength, the skills, the security and the flexibility needed to reap the rewards of our growing, changing economy. The President recently laid out this broad agenda in his State of the Union and again in his FY1999 budget. I will now focus on 2 of the key agenda areas that we discuss in this year's *Economic Report* -- children and childcare and racial and ethnic economic equality.

First, let me talk about children and childcare. Chapter 3 of this year's *Report* notes that

there have been notable improvements in children's well-being over the past three years. While too many children are still living in poverty, the official child poverty rate has fallen by 2.2 percentage points since 1993. The primary reason for this drop is because more families were able to earn enough money to bring their incomes above the poverty line.

The share of children living in households without enough to eat has also fallen, as has the share of households with children living in housing in poor physical condition. There have also been increases in children's utilization of basic health care services, and continued improvements in mortality rates of infants and young children.

Despite these improvements, many children remain economically vulnerable. One in five children, and nearly one in two children in female-headed families, had incomes below the poverty level in 1996. One in seven children did not have access to health insurance in 1996, and one in nine lived in households which paid more than half their income for housing in 1995. Finally, a large share of children fail to achieve even a basic levels of proficiency in science, mathematics, and reading.

For this reason, the President has developed a number of initiatives to strengthen the economic and social supports for America's children. This year, the Administration has begun to implement the Children's Health Insurance Program, which offers \$24 billion over five years to States to expand health insurance for uninsured children. For fiscal 1999, the President has proposed to expand the supply of affordable housing for low-income families, through a 40% increase in the low-income housing tax credit, and through continued expansions in the HOME

Investments Partnership Program. The President has also proposed two major new initiatives to improve the quality of elementary and secondary education. The first would invest \$12.4 billion over 7 years to bring down class sizes in public schools in grades 1 to 3 from a nationwide average of 22 pupils in to an average of 18. The second would provide tax credits to pay interest on nearly in \$22 billion in bonds to support new construction and renovation of public school buildings.

Chapter 3 of the *Report* also discusses the challenges of childcare. Today, more American workers are faced with the need to juggle the demands of the workplace with the demands of family and home. In 1997, over 60 percent of married mothers with a child under six were working--compared to 30 percent twenty years ago. For most of these families, it is difficult to afford high quality day care. A recent study of regulated child care providers found that 86 percent of child care centers surveyed provided mediocre or poor care when judged from the perspective of child development, and 12 percent were of such poor quality that the children's health and safety needs were only partly met.

The President's 1999 budget includes a \$21 billion increase in funding for child care, to make it accessible to more families and to raise its quality. An important part of this proposal is increased tax credits for 3 million working families to help them pay for child care, as well as an increase in block grants to States that will directly subsidize child care for low-income families. In addition, the proposal calls for a new Early Learning Fund, along with support for the enforcement of State child care health and safety standards, scholarships for up to 50,000 child care providers per year, and funding for research and consumer education. Finally, the proposal

includes \$3.8 billion in additional funding over 5 years to help to reach the goal of expanding participation in Head Start to 1 million children in 2002.

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address, Vice President Gore announced the Administration's package of proposed civil rights enforcement initiatives. In addition to increasing funding, these initiatives place greater emphasis on the nonlitigation and prevention remedies for discrimination, and provide for better coordination across Federal agencies and offices. The President has also initiated and devoted great energy and resources to his Initiative on Race, an effort to further a national dialogue on race in America.

CONCLUSION

Let me conclude by saying that over the past year the performance of the U.S. economy has been extraordinary: strong growth and low unemployment combined with low and stable inflation. And there are enormous social and economic benefits to our high-employment economy. There are still long-term changes and challenges facing our nation as we enter the 21st Century. The Clinton Administration has an agenda for helping to equip the American people with the skills and flexibility and security to take advantages of the opportunities and possibilities in this new economic era.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 9-FEB-1998 18:12:43.00

SUBJECT: Testimony

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

TEXT:

I'm happy with the changes you have made. The international trading qualification in the sentence is good. Why don't we distribute ccjanrev.f15 for comments. Will you do it or do you want me to?

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 9-FEB-1998 09:56:16.00

SUBJECT: ERP Statement and CNP Speech

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

READ:UNKNOWN

TEXT:

----- Forwarded by Janet L. Yellen/CEA/EOP on 02/09/98
09:55 AM -----

Janet L. Yellen

02/09/98 09:31:10 AM

Record Type: Record

To: Rebecca M. Blank/CEA/EOP, Charles F. Stone/CEA/EOP, Sanders D.
Korenman/CEA/EOP, Maria J. Hanratty/CEA/EOP

cc:

Subject: ERP Statement and CNP Speech

I have edited the material on children and race a bit. Is the current
version okay?

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

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The 1998 Economic Report of the President

Dr. Janet Yellen
Chairman, President's Council of Economic Advisers
Center for National Policy
February 10, 1998

Thank you. It is a pleasure to be here. I want to thank the Center for National Policy for again hosting the release of the annual *Economic Report of the President*. In particular, I want to thank Mo Steinbruner and Mike Pietro (pronounced "Pee-tro") for all of their help in arranging the event.

I would also like to thank my colleagues--Jeff Frankel and Rebecca Blank--for all their hard work and dedication in producing this year's *Report*.

Finally, I want to thank the staff of the Council, many of whom are here with us today. During the past several months, the staff have been working long nights and weekends to produce the *Economic Report*. And, because the other work of the Council doesn't disappear, they are in effect working two jobs with two shifts. I appreciate all of their hard work, their thoughtful insights and their good spirits. Their dedication and professionalism deserve special recognition.

As you probably know, the Employment Act of 1946, which created the Council of Economic Advisers, requires the President to submit an *Economic Report* to the Congress each year. The Employment Act, together with its later amendments, gave the Federal government responsibility for stabilizing short-run economic fluctuations, promoting balanced and

noninflationary economic growth, and fostering low unemployment. One purpose of the *Economic Report* is to tell Congress whether we have met those responsibilities. I am happy to say, in this the fifty-second year after the Act, that the state of the economy is truly extraordinary.

I will elaborate on this point in a moment, but I would also like to note that the *Report of the Council of Economic Advisers*, has also traditionally been a vehicle for presenting a broad range of analyses of current economic policy issues. This year, in addition to a chapter on macroeconomic policy and performance, the Report contains a chapter on the economic well-being of families and children, and a chapter on racial and ethnic inequality--two central concerns of this Administration. The report also contains two chapters on microeconomic topics, one focusing on improving economic efficiency in the areas of health and environmental policy, and one discussing recent trends in antitrust policy. Finally, the international chapter focuses on the benefits of opening international markets.

In the remainder of my remarks I will touch briefly on the current state of the economy, and then discuss the broad and lasting benefits of a "high-employment economy" -- which is one of the key themes of this year's *Economic Report*. I will then talk about some of the key challenges that still face our nation as we move into the 21st Century.

STATE OF THE ECONOMY

Our Nation's economy is the strongest it has been in a generation. In 1997, growth was strong and job creation was vigorous while inflation declined. Real GDP grew 3.9 percent, and employment rose by 3.2 million, for an average rate of 267,000 jobs per month. The unemployment rate dropped below 5 percent for the first time in 24 years, yet core inflation rose just 2.2 percent. And, this occurred during a period of historic deficit reduction: the Federal

budget deficit, which reached \$290 billion in the 1992 fiscal year, declined to only \$22 billion in fiscal 1997. And, as you know, the President recently submitted to Congress a budget for fiscal 1999 that projects a balanced budget for the first time since 1969.

As 1998 begins, the prospects for continued growth with high employment and low inflation are excellent. The economy is remarkably free of the symptoms that often presage an economic downturn -- that is, inflationary pressures remain well under control; inventories are lean in comparison with sales; and there is no evidence of any financial imbalance that could disrupt the expansion. Economic turmoil in East Asia, assuming that stability is restored, may work to permit continued U.S. growth and job creation with a more moderate outlook for interest rates. Our economy is in fundamentally sound shape and well-equipped to handle any unexpected bouts of rougher weather.

THE BENEFITS OF A HIGH EMPLOYMENT ECONOMY

The exceptionally strong economy that we are enjoying today is due in part to the sound and credible economic strategy put in place by the Clinton Administration. The Administration's strategy has focused on getting the fundamentals right -- reducing the budget deficit, investing in the American people, and opening markets at home and abroad. These were the right policies to stimulate the job creation needed to move the economy to full employment. And, they are the right policies for attacking the longer term problems of sluggish productivity growth and widening income inequality that had afflicted our nation's economy since the early 1970s.

The *Report* underscores the enormous economic and social benefits to a "high-employment economy." An economy with strong job creation and low unemployment

can make a broad and lasting contribution to the well-being of the American people. Let me talk briefly about some of these benefits:

First, a high employment economy produces certain *direct and measurable benefits*.

Returning the economy to full employment yields a direct and measurable benefit to our nation by ensuring that the economy's resources--human and material--are not squandered by needless cyclical unemployment. On average, reducing the unemployment rate by a percentage point raises output by approximately 2 percent; in 1997, 2 percent of GDP was \$160 billion, or roughly \$600 for every American man, woman, and child. Wasted resources from not producing at potential, together with the human cost of unemployment, are intolerable; the elimination of this waste is the principal benefit of a sustained return to full employment.

Second, a high-employment economy can *reduce long-term joblessness*. A tight labor market encourages participation by those who might otherwise be forced to sit on the sidelines, and makes it easier to absorb less skilled or younger and more inexperienced workers into the labor force. These new labor market entrants gain much-needed job experience, building the skills they will need to hold down a job in the future. The experience of some European countries illustrates this point: in Europe, the prolonged stagnation or recession may have led to a permanent increase in unemployment there, as the unemployed and the never-employed have seen their skills atrophy or become obsolete. For this reason, running a high-employment economy, may be one of the surest ways to ensure that an unacceptably large fraction of our citizens are not consigned to long-term joblessness and economic marginalization.

Third, it will *help move welfare recipients into the workforce*. Keeping the unemployment rate low and job growth high is necessary if we are to move current welfare

recipients into the work force. Early, indirect evidence on this point is encouraging: employment and labor force participation rates among single women who maintain families--about two-thirds of whom have children under 18--have increased in the past few years. This is probably in part the result of recent welfare reform: the greatest acceleration in employment rates has occurred among those single women most likely to be affected by welfare reform, namely, those with young children. Nevertheless, it is obvious that fostering an economy in which job opportunities are plentiful plays a crucial part in aiding the transition from welfare to work.

Fourth, it *enhances personal economic security*. Knowing that work is available to those who seek it, at wages sufficient to keep them and their families out of poverty, is a key to personal economic security. A tight labor market increases the confidence of job losers that they will be able to return to work, lures discouraged workers back into the labor force, enhances the prospects of those already at work to get ahead, enables those who want or need to switch jobs to do so without a long period of joblessness, and lowers the duration of a typical unemployment spell.

And, finally, a high-employment economy *may help reverse the trend toward greater economic inequality*. From the 1980s until the early 1990s, the economy's ability to reduce poverty through growth alone was hampered by a strong headwind: for the poorest Americans, the benefits of an expanding economy were offset by the sustained declines in wages at the low end of the earnings distribution. Since 1993, living standards for all Americans are on the rise, especially for those at the bottom of the income distribution. The poverty rate fell to 13.7 percent in 1996, from 15.1 percent in 1993; the poverty rate for black Americans is at a historical low, and in 1997 unemployment among blacks fell to its lowest rate since 1973. Since 1993,

household income has grown in each quintile of the income distribution, with the largest percentage increase going to the poorest members of our society. Maintaining a full-employment economy is essential if this progress is to continue.

CHALLENGES IN A CHANGING ECONOMY

Yes, our economy is strong and Americans are working in record numbers. And there are broad and lasting benefits to sustaining a healthy economy with strong job creation and low unemployment.

But our Nation still faces other, broader challenges as we move into the 21st century. In many ways the U.S. economy today is very different from that in which our parents and grandparents lived and worked. Today, 24 percent of families are headed by a single parent, compared with 14 percent 25 years ago. Three in five married mothers with children under 6 are in the work force--twice as large a share as in 1970. And the U.S. population is aging-- in the next century there will be fewer workers for every retiree, making issues related to retirement security more and more important. The nature of the workplace also has changed significantly: few American workers expect to be working for the same employer--or even to be in the same career--when they retire. Information technology is dominating industry: in the 1950s the information technology industry barely existed; today it employs a larger share of the labor force than the automobile industry did in the 1950s and 1960s. Because information and technology and global commerce are leading the transformation of the global economy, the new strength of a nation will be found in the skills, knowledge and imagination of its people.

The Clinton Administration's agenda is designed to deal with these changes and the challenges they pose. It is designed to equip the American people with the strength, the skills,

the security and the flexibility needed to reap the rewards of our growing, changing economy. The President recently laid out this broad agenda in his State of the Union and again in his FY1999 budget. In the remainder of my remarks, I will focus on 3 of the key agenda areas: retirement security, the challenges of childcare and racial and ethnic economic inequality.

First, let me talk about issues related to the aging of the population, which we address in Chapter 1 of the *Economic Report* -- reforming Social Security.

For almost 60 years, Social Security has provided Americans with income security in retirement and protection against loss of family income due to disability or death. A large share of elderly Americans, particularly those with low incomes, rely on Social Security as their primary source of pension income in retirement. The system has enjoyed dramatic success in reducing poverty rates among older Americans.

Today, however, many Americans fear that Social Security will not be there for them when they are ready to retire. This concern reflects the widespread recognition that, under current "intermediate" projections of the Social Security trustees, the system faces a long-term funding gap: beginning in 2012, unless the system is reformed by then, the government will be unable to pay current Social Security benefits in full out of current payroll taxes; it will then have to draw down the system's trust fund, and by 2029 those funds will be exhausted. If still nothing has been done, the government would then face several options which it could adopt singly or in combination: it could reduce benefits until they are in line with collections, raise payroll taxes to cover an unchanged level of benefits, or finance the shortfall from other parts of the budget, by raising other taxes, cutting expenditures on other programs, or borrowing and allowing the budget deficit to increase. One or more of these measures will have to be taken so long as no

changes are made to the present system.

Although the seriousness of the financial imbalance facing Social Security should not be downplayed, its magnitude is not so large as to be insurmountable, particularly if early action is taken. For example, even if nothing is done and the trust fund is exhausted, payroll taxes will still be sufficient to permanently finance roughly 75 percent of benefits. Put another way, the difference between the anticipated income and the anticipated expenditures of the OASDI (Old Age, Survivors', and Disability Insurance) program over the next 75 years amounts to around 2¼ percentage points of taxable payroll, or approximately 1 percent of GDP. These facts suggest that the problem of placing Social Security on a sound financial footing can admit of eventual resolution.

The President is committed to Saving Social Security First. He has proposed reserving 100 percent of any budget surplus until steps have been taken to reform Social Security. He has also proposed a process to devise an appropriate solution over the next 2 years.

A second major policy challenge involves children and issues related to childcare.

Chapter 3 of this year's *Report* documents that there have been notable improvements in children's well-being over the past three years, although an unacceptable fraction of America's children still live in poverty. Children have shared in the benefits of the recent economic expansion: the official child poverty rate has fallen by 2.2 percentage points since 1993. And, under a broader measure of poverty which includes both taxes (like the EITC) and non-medical in-kind benefits, the poverty rate for children has decreased by 4.7 percentage points from 1993 to 1996, and is now below its level in 1989. The primary reason for this drop is because more families were able to earn enough money to bring their incomes above the poverty line. Child

poverty has also declined due to an expansion of the Earned Income Tax Credit.

Other measures of children's well-being have also improved. The share of children living in households without enough to eat has fallen since the early 1990s, and the share of households with children living in housing in poor physical condition has also declined since the late 1970s. There have also have been increases in low-income children's utilization of basic health care services, and continued improvements in mortality rates of infants and young children during the 1990s.

Despite these improvements, many children remain economically vulnerable. One in five children, and nearly one in two children in female-headed families, had incomes below the poverty level in 1996. Adequacy of family income is a critical predictor of both the present and future well-being of children. Children who grow up in low-income families score lower on standardized tests, complete fewer years of school and tend to have lower earnings. With respect to medical care, one in seven children did not have access to health insurance in 1996, despite substantial increases in Medicaid coverage since 1989, due to a concurrent decline in children's private health insurance coverage; one in nine children lived in households which paid more than half their income for housing in 1995. Finally, a large share of children are not attaining even a basic levels of proficiency in science, mathematics, and reading. Thus, too many children are at risk of current and future hardship.

For this reason, the President has developed a number of initiatives to strengthen the economic and social supports for America's children. This year, the Administration has begun to implement the Children's Health Insurance Program, which offers \$24 billion over five years to States to expand health insurance for uninsured children. For fiscal 1999, the President has

proposed to expand the supply of affordable housing for low-income families, through a 40% increase in the low-income housing tax credit, and through continued expansions in the HOME Investments Partnership Program. The President has also proposed two major new initiatives to improve the quality of elementary and secondary education. The first would invest \$12.4 billion over 7 years to bring down class sizes in public schools in grades 1 to 3 from a nationwide average of 22 pupils in to an average of 18. The second would provide tax credits to pay interest on nearly in \$22 billion in bonds to support new construction and renovation of public school buildings.

Today, more American workers are faced with the need to juggle the demands of the workplace with the demands of family and home. In 1997, over 60 percent of married mothers with a child under six were working--compared to 30 percent twenty years ago. For most of these families, it is difficult to afford high quality day care. In 1993, child care expenditures represented 25 percent of annual income for those families with annual incomes below \$14,400 with employed mothers and preschool children in paid care. Comparable families with annual incomes above \$54,000 spent only 6 percent of their income on child care. There is also reason to be concerned about the quality of child care: A recent study of regulated child care providers found that 86 percent of child care centers surveyed provided mediocre or poor care when judged from the perspective of child development, and 12 percent were of such poor quality that the children's health and safety needs were only partly met.

The President's 1999 budget includes a \$21 billion increase in funding for child care, to make it accessible to more families and to raise its quality. An important part of this proposal is increased tax credits for 3 million working families to help them pay for child care, as well as an

increase in block grants to States that will directly subsidize child care for low-income families. In addition, the proposal calls for a new Early Learning Fund, along with support for the enforcement of State child care health and safety standards, scholarships for up to 50,000 child care providers per year, and funding for research and consumer education. Finally, the proposal includes \$3.8 billion in additional funding over 5 years to help to reach the goal of expanding participation in Head Start to 1 million children in 2002.

Finally, I'd like to talk about issues related to the progress of different racial and ethnic groups. Chapter 4 of the *Economic Report* reviews trends in racial and ethnic economic inequality and concludes that this country's longstanding goal of achieving racial equality has not yet been attained. Although there has been progress in narrowing economic gaps among racial and ethnic groups in the postwar period, it has been very uneven, with rapid progress in the 1960s and early 1970s, followed by 20 years of stagnation between the early to mid-1970s to the early 1990s.

The current expansion has brought signs of renewed progress: since 1993, for example, the median income of black families has risen more rapidly than that of non-Hispanic whites; in 1996, black family income reached a new high, and the poverty rate for blacks fell to a new low. Data compiled under the Home Mortgage Disclosure Act show that between 1993 and 1996, conventional home mortgage lending to blacks rose 67% and to Hispanics, 49%--much larger than the percentage increase in conventional home mortgage lending overall during this period. Such developments raise hope for renewed and sustained progress toward economic equality.

Nevertheless, substantial disparities in economic status across racial and ethnic groups persist. For example, income gaps between black and white families are as large today as they

were 30 years ago. The median wealth of white families is by some estimates 10 times that of black and Hispanic families. Poverty rates of blacks and Hispanics are almost triple those of non-Hispanic whites; and differences in child poverty rates across racial and ethnic groups are stark, with about 40 percent of black and Hispanic children in poverty in comparison with about 16% for whites.

Because the largest share of most families' income is derived from earnings, labor market outcomes across racial groups are important determinants of economic inequality across racial groups. After increasing rapidly between 1965 and the mid 1970s, the wages of black and Hispanic men and women relative to those of non-Hispanic whites have stagnated or declined between the mid 1970s and early 1990s. Part of this erosion of relative pay reflects a society wide trend toward rising income inequality, due to an increase in the demand for more educated workers and an increase in the skilled-unskilled earnings differential. Because blacks, Hispanics and American Indians are less likely to hold a college degree than whites and Asians, these groups have been hurt disproportionately by changes in the economy that have raised the demand for college educated workers. Over the last 30 years, educational attainment has increased for all groups and blacks largely closed the high school attainment gap with whites; however, the college completion gap widened in the 1980s, as the reward to college educated workers rose.

Although differences in education across racial groups explain a portion of the trend toward rising earnings inequality since the mid-1970s, racial earnings gaps have also increased among individuals with similar educational levels, suggesting that other factors may also be at work. For example, since the mid-1970s the wages of young black college graduates have fallen relative to those of their white counterparts. Researchers debate whether this trend reflects

unmeasured skill differences potentially related to school quality, to discrimination in the labor market, or to other factors.

Clearly, more needs to be done to promote equality of opportunity for all Americans. Many of the Administration's current and proposed policies, such as those that encourage community empowerment and those that promote improved quality and accessibility of education at all levels are intended to address these disparities. Furthermore, the Administration's 1999 budget proposal signals a renewed federal commitment to strong and effective enforcement of the Nation's civil rights laws. It increases funding for federal civil rights enforcement agencies by more than 16 percent. And, this January, in a Martin Luther King Day address, Vice President Gore announced the Administration's package of proposed civil rights enforcement initiatives. In addition to increasing funding, these initiatives place greater emphasis on the nonlitigation and prevention remedies for discrimination, and provide for better coordination across Federal agencies and offices. The President has also initiated and devoted great energy and resources to his Initiative on Race, an effort to further a national dialogue on race in America.

CONCLUSION

Let me conclude by saying that over the past year the performance of the U.S. economy has been extraordinary: strong growth and low unemployment combined with low and stable inflation. And there are enormous social and economic benefits to our high-employment economy. But that success--and the economy's present strength--cannot be taken for granted. Rather, there are still long-term changes and challenges facing our nation as we enter the 21st Century. The Clinton Administration has an agenda for helping to equip the American people

with the skills and flexibility and security to take advantages of the opportunities and possibilities in this new economic era. We must finish the job of balancing the budget while investing in people and opening markets at home and abroad. At the same time, we must ensure that all Americans, regardless of age or origin, have the skills they need to prosper in a world of change and opportunity.

The 1998 Economic Report of the President

Thank you all for coming in today to hear about the *1998 Economic Report of the President*.

As you know, Congress requires the President to submit each year a Report that describes the state of the US economy. But, the *Report* has also traditionally been a vehicle for presenting a broad range of analyses of current economic policy issues. This year, in addition to a chapter on macroeconomic policy and performance, the *Report* contains a chapter on the economic well-being of families and children, and a chapter on racial and ethnic inequality--two central concerns of this Administration. The report also contains two chapters on microeconomic topics, one focusing on improving economic efficiency in the areas of health and environmental policy, and one discussing recent trends in antitrust policy. Finally, it includes an international chapter, which focuses on the benefits of opening international markets.

Let me first touch briefly on the current state of the economy, and then discuss the broad and lasting benefits of a "high-employment economy" -- which is one of the key themes of this year's *Economic Report*. I will then talk specifically about the Chapters on Race and Children.

STATE OF THE ECONOMY

Our Nation's economy is the strongest it has been in a generation. In 1997, growth was exceptional and job creation was vigorous while inflation declined. Real GDP grew 3.9 percent,

and employment rose by 3.2 million, for an average rate of 267,000 jobs per month. The unemployment rate dropped below 5 percent for the first time in 24 years, yet core inflation rose just 2.2 percent. And, this occurred during a period of historic deficit reduction: the Federal budget deficit, which reached \$290 billion in the 1992 fiscal year, declined to only \$22 billion in fiscal 1997. And, as you know, the President recently submitted to Congress a budget for fiscal 1999 that projects a balanced budget for the first time since 1969.

As 1998 begins, the prospects for continued growth with high employment and low inflation are excellent. The economy is remarkably free of the symptoms that often presage an economic downturn -- that is, inflationary pressures remain well under control; inventories are lean in comparison with sales; and there is no evidence of any financial imbalance that could disrupt the expansion. Economic turmoil in East Asia, assuming that stability is restored, may work to permit continued U.S. growth and job creation with a more moderate outlook for interest rates. Our economy is in fundamentally sound shape and well-equipped to handle any unexpected bouts of rougher weather.

THE BENEFITS OF A HIGH EMPLOYMENT ECONOMY

The exceptionally strong economy that we are enjoying today is due in part to the sound and credible economic strategy put in place by the Clinton Administration. The Administration's strategy has focused on getting the fundamentals right -- reducing the budget deficit, investing in the American people, and opening markets at home and abroad. These were the right policies to stimulate the job creation needed to move the economy to full employment.

The *Report* underscores the enormous economic and social benefits to a

“high-employment economy.” An economy with strong job creation and low unemployment can make a broad and lasting contribution to the well-being of the American people. Let me talk briefly about some of these benefits:

First, a high employment economy produces certain *direct and measurable benefits*. Returning the economy to full employment yields a direct and measurable benefit to our nation by ensuring that the economy’s resources--human and material--are not squandered by needless cyclical unemployment. On average, reducing the unemployment rate by a percentage point raises output by approximately 2 percent; in 1997, 2 percent of GDP was \$160 billion, or roughly \$600 for every American man, woman, and child. Wasted resources from not producing at potential, together with the human cost of unemployment, are intolerable; the elimination of this waste is the principal benefit of a sustained return to full employment.

Second, a high-employment economy can *reduce long-term joblessness*. A tight labor market encourages participation by those who might otherwise be forced to sit on the sidelines, and makes it easier to absorb less skilled or younger and more inexperienced workers into the labor force. These new labor market entrants gain much-needed job experience, building the skills they will need to hold down a job in the future. The experience of some European countries illustrates this point: in Europe, the prolonged stagnation or recession may have led to a permanent increase in unemployment there, as the unemployed and the never-employed have seen their skills atrophy or become obsolete. For this reason, running a high-employment economy, may be one of the surest ways to ensure that an unacceptably large fraction of our citizens are not consigned to long-term joblessness and economic marginalization.

Third, it will *help move welfare recipients into the workforce*. Keeping the

unemployment rate low and job growth high is necessary if we are to move current welfare recipients into the work force. Early, indirect evidence on this point is encouraging: employment and labor force participation rates among single women who maintain families--about two-thirds of whom have children under 18--have increased in the past few years. This is probably in part the result of recent welfare reform: the greatest acceleration in employment rates has occurred among those single women most likely to be affected by welfare reform, namely, those with young children. Nevertheless, it is obvious that fostering an economy in which job opportunities are plentiful plays a crucial part in aiding the transition from welfare to work.

Fourth, it *enhances personal economic security*. Knowing that work is available to those who seek it, at wages sufficient to keep them and their families out of poverty, is a key to personal economic security. A tight labor market increases the confidence of job losers that they will be able to return to work, lures discouraged workers back into the labor force, enhances the prospects of those already at work to get ahead, enables those who want or need to switch jobs to do so without a long period of joblessness, and lowers the duration of a typical unemployment spell.

And, finally, a high-employment economy *may help reverse the trend toward greater economic inequality*. From the 1980s until the early 1990s, the economy's ability to reduce poverty through growth alone was hampered by a strong headwind: for the poorest Americans, the benefits of an expanding economy were offset by the sustained declines in wages at the low end of the earnings distribution. Since 1993, living standards for all Americans are on the rise, especially for those at the bottom of the income distribution. The poverty rate fell to 13.7 percent in 1996, from 15.1 percent in 1993; the poverty rate for black Americans is at a historical low,

and in 1997 unemployment among blacks fell to its lowest rate since 1973. Since 1993, household income has grown in each quintile of the income distribution, with the largest percentage increase going to the poorest members of our society. Maintaining a full-employment economy is essential if this progress is to continue.

CHALLENGES IN A CHANGING ECONOMY

Although our economy is strong and Americans are working in record numbers, our Nation still faces other, broader challenges as we move into the 21st century. The President addressed these challenges in the SOTU and presented a variety of proposals there and in his budget. The ERP also discusses several of these challenges. In the remainder of my remarks, I will focus on 2 of the key agenda areas: the challenges of improving the wellbeing of America's children and enhancing the quality and availability of childcare and issues relating to racial and ethnic economic inequality.

A major policy challenge involves children and issues related to childcare.

Chapter 3 of this year's *Report* assesses the economic situation of children and documents that although an unacceptable fraction of America's children still live in poverty, there have been notable improvements in children's well-being over the past three years. Children have shared in the benefits of the recent economic expansion: the official child poverty rate has fallen by 2.2 percentage points since 1993. And, under a broader measure of poverty which includes both taxes (like the EITC) and non-medical in-kind benefits, the poverty rate for children has decreased by 4.7 percentage points from 1993 to 1996, and is now below its level in 1989. The primary reason for this drop is because more families were able to earn enough money to bring their incomes above the poverty line--a benefit of the strong economy. Child poverty has also

declined due to an expansion of the Earned Income Tax Credit.

Other measures of children's well-being have also improved. The share of children living in households without enough to eat has fallen since the early 1990s, and the share of households with children living in housing in poor physical condition has also declined since the late 1970s. There have also have been increases in low-income children's utilization of basic health care services, and continued improvements in mortality rates of infants and young children during the 1990s.

Despite these improvements, far too many children remain economically vulnerable. One in five children, and nearly one in two children in female-headed families, had incomes below the poverty level in 1996. Adequacy of family income is a critical predictor of both the present and future well-being of children. Children who grow up in low-income families score lower on standardized tests, complete fewer years of school and tend to have lower earnings. With respect to medical care, one in seven children did not have access to health insurance in 1996, despite substantial increases in Medicaid coverage since 1989, due to a concurrent decline in children's private health insurance coverage; one in nine children lived in households which paid more than half their income for housing in 1995. Finally, a large share of children are not attaining even a basic levels of proficiency in science, mathematics, and reading. Thus, too many children are at risk of current and future hardship.

For this reason, the President has developed a number of initiatives to strengthen the economic and social supports for America's children. I will not review all of these in detail. They include the Children's Health Insurance Program, which offers \$24 billion over five years to States to expand health insurance for uninsured children. For fiscal 1999, the President has

proposed to expand the supply of affordable housing for low-income families, through a 40% increase in the low-income housing tax credit, and through continued expansions in the HOME Investments Partnership Program. The President has also proposed two major new initiatives to improve the quality of elementary and secondary education. The first would invest \$12.4 billion over 7 years to bring down class sizes in public schools in grades 1 to 3 from a nationwide average of 22 pupils in to an average of 18. The second would provide tax credits to pay interest on nearly in \$22 billion in bonds to support new construction and renovation of public school buildings.

The ERP also documents changes in family life which make childcare a critical issue. Today, more American workers are faced with the need to juggle the demands of the workplace with the demands of family and home. In 1997, over 60 percent of married mothers with a child under six were working--compared to 30 percent twenty years ago. For most of these families, it is difficult to afford high quality day care. In 1993, child care expenditures represented 25 percent of annual income for those families with annual incomes below \$14,400 with employed mothers and preschool children in paid care. Comparable families with annual incomes above \$54,000 spent only 6 percent of their income on child care. There is also reason to be concerned about the quality of child care: A recent study of regulated child care providers found that 86 percent of child care centers surveyed provided mediocre or poor care when judged from the perspective of child development, and 12 percent were of such poor quality that the children's health and safety needs were only partly met.

The President's 1999 budget therefore includes a \$21 billion increase in funding for child care, to make it accessible to more families and to raise its quality. **(I will not review the full set**

of policies in detail.)

A second challenge facing America relates to the economic progress of different racial and ethnic groups. Chapter 4 of the *Economic Report* reviews trends in racial and ethnic economic inequality and concludes that this country's longstanding goal of achieving racial equality has not yet been attained. Although there has been progress in narrowing economic gaps among racial and ethnic groups in the postwar period, it has been very uneven, with rapid progress in the 1960s and early 1970s, followed by 20 years of stagnation between the early to mid-1970s to the early 1990s.

The current expansion has brought signs of renewed progress: since 1993, for example, the median income of black families has risen more rapidly than that of non-Hispanic whites; in 1996, black family income reached a new high, and the poverty rate for blacks fell to a new low. Data compiled under the Home Mortgage Disclosure Act show that between 1993 and 1996, conventional home mortgage lending to blacks rose 67% and to Hispanics, 49%--much larger than the percentage increase in conventional home mortgage lending overall during this period. Such developments raise hope for renewed and sustained progress toward economic equality.

Nevertheless, substantial disparities in economic status across racial and ethnic groups persist. For example, income gaps between black and white families are as large today as they were 30 years ago. The median wealth of white families is by some estimates 10 times that of black and Hispanic families. Poverty rates of blacks and Hispanics are almost triple those of non-Hispanic whites; and differences in child poverty rates across racial and ethnic groups are stark, with about 40 percent of black and Hispanic children in poverty in comparison with about 16% for whites.

Because the largest share of most families' income is derived from earnings, labor market outcomes across racial groups are important determinants of economic inequality across racial groups. After increasing rapidly between 1965 and the mid 1970s, the wages of black and Hispanic men and women relative to those of non-Hispanic whites have stagnated or declined between the mid 1970s and early 1990s. (The black-white ratio of median weekly earnings for full-time workers 25 and over in 1997 was 0.74 for men and 0.83 for women; 0.63 for Hispanic men and 0.71 for Hispanic women.) Part of this stagnation/erosion of relative pay reflects a society wide trend toward rising income inequality, due to an increase in the demand for more educated workers reflected in an increase in the skilled-unskilled earnings differential. Because blacks, Hispanics and American Indians are less likely to hold a college degree than whites and Asians, these groups have been hurt disproportionately by changes in the economy that have raised the demand for college educated workers. Over the last 30 years, educational attainment has increased for all groups and blacks largely closed the high school attainment gap with whites; however, the college completion gap widened in the 1980s, just as the reward to college educated workers rose.

Although differences in education across racial groups explain a portion of the trend toward rising earnings inequality since the mid-1970s, racial earnings gaps have also increased among individuals with similar educational levels, suggesting that other factors may also be at work. For example, since the mid-1970s the wages of young black college graduates have fallen relative to those of their white counterparts. Researchers debate whether this trend reflects unmeasured skill differences potentially related to school quality, to discrimination in the labor market, or to other factors.

Clearly, more needs to be done to promote equality of opportunity for all Americans. Many of the Administration's current and proposed policies, such as those that encourage community empowerment and those that promote improved quality and accessibility of education at all levels are intended to address these disparities. Furthermore, the Administration's 1999 budget proposal signals a renewed federal commitment to strong and effective enforcement of the Nation's civil rights laws. It increases funding for federal civil rights enforcement agencies by more than 16 percent. And, this January, in a Martin Luther King Day address, Vice President Gore announced the Administration's package of proposed civil rights enforcement initiatives. In addition to increasing funding, these initiatives place greater emphasis on the nonlitigation and prevention remedies for discrimination, and provide for better coordination across Federal agencies and offices. The President has also initiated and devoted great energy and resources to his Initiative on Race, an effort to further a national dialogue on race in America.

CONCLUSION

Let me conclude by saying our Report concludes that over the past year the performance of the U.S. economy has been extraordinary: strong growth and low unemployment combined with low and stable inflation. And there are enormous social and economic benefits to our high-employment economy. But that success--and the economy's present strength--cannot be taken for granted. Rather, there are still long-term changes and challenges facing our nation as we enter the 21st Century. The Clinton Administration has an agenda for helping to equip the American people with the skills and flexibility and security to take advantages of the opportunities and possibilities in this new economic era. We must finish the job of balancing the

budget while investing in people and opening markets at home and abroad. At the same time, we must ensure that all Americans, regardless of age or origin, have the skills they need to prosper in a world of change and opportunity.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 9-FEB-1998 18:37:14.00

SUBJECT: Social Security Q&A: draft from Friday's meeting

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:

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The following is a HEX DUMP:

HARD Q&A ON SOCIAL SECURITY

February 8, 1998

Q: WHAT DOES “RESERVED” MEAN? WHAT IF YOU DON’T ACCOMPLISH REFORM BEFORE THE SURPLUSES BEGIN ACCRUING?

- First, reserved means that we should not spend the surpluses until Social Security reform is accomplished.
- Second, we hope to achieve that reform before the end of 1999, which is the first year for which we project a unified budget surplus.

FOLLOW: BUT WHAT IF A SURPLUS ACCRUES?

- First, mechanically, if surpluses accrue before Social Security reform is accomplished, they would be used to reduce the publicly held debt. That’s the default. But that’s also fully consistent with not spending the money until we have achieved reform.
- Second, we don’t project significant surpluses before FY 2000 -- so the amounts involved are likely to be small.
- Third, if significant surpluses look likely before we can achieve reform, we would be willing to revisit our formulation and perhaps consider legislation to create an explicit Social Security Reserve Fund.

Q: GENERIC QUESTION ON MODERATE INDIVIDUAL ACCOUNTS, EQUITY INVESTMENTS, OR SPECIFIC PROPOSALS (GREGG, KERREY, ETC.):

- First, the President has declared that 1998 should be a year of national education and debate over the best bipartisan solution to strengthening Social Security for the 21st century. The Administration has made clear that we do not want to politicize the debate at this point.
- Second, the unified surpluses that are now being projected introduce a new element into the Social Security debate. President Clinton’s “Save Social Security First” policy means that we must all update our thinking to reflect the potential use of the surplus to bolster Social Security.
- Third, it does not seem prudent to comment upon one specific element in what will have to be a comprehensive package. What we care about is the total package -- whether the entire package strengthens and updates Social Security for the 21st century. There may be specific elements that could be problematic by themselves, but that are acceptable as part of an overall package.

SPECIFIC FOLLOW-UP QUESTIONS

Q: GREGG OR KERREY (MODERATE INDIVIDUAL ACCOUNTS, WITH REDIRECTION OF PART OF OASDI PAYROLL TAX):

A: Some have already embraced [Gregg's or Kerrey's] approach, while others are concerned that his proposal would redirect part of the OASDI payroll tax and thus hasten the date of exhaustion for the Social Security Trust Fund -- exacerbating the problem that we face. Again, we look forward to a healthy national debate over the best way to move forward.

Q: WEAVER (PSA PLAN FOR 5 PERCENT PERSONAL SECURITY ACCOUNTS):

A: We are opposed to a radical privatization, and are therefore concerned about the Weaver approach. We are also concerned about its impact on the Federal budget.

FOLLOW: HOW DO YOU DEFINE PRIVATIZATION?

A: I can't give you a specific definition. The basic question is whether the long-run viability of the Social Security system as a foundation of retirement security is protected.

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

A: That is the sort of issue that will have to be 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: DOES THE ADMINISTRATION SUPPORT INDIVIDUAL ACCOUNTS AS PART OF ANY SOLUTION TO THE SOCIAL SECURITY PROBLEM?

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

Some have pointed to the benefits of individual accounts, while others have emphasized concerns about their potential transaction costs, shifting of investment risk to individual workers, lack of progressivity, and the needs of the current system to pay benefits to those who have already contributed.

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.

FOLLOW ON INDIVIDUAL ACCOUNTS: BUT DOES THE ADMINISTRATION SUPPORT THEM?

A: We are clearly opposed to a radical privatization. But it doesn't seem productive to speak hypothetically about any particular provision -- moderate individual accounts or any other option -- since my views about them depend on the overall package within which they might be included as part of efforts to strengthen the Social Security system.

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, as David Broder and others have indicated, 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: 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.

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 will be 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

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. If the surpluses are ultimately used for Social Security, the impact is the same in economic terms: it is like buying down the debt and using the benefits for Social Security.

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, January 27, 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.

Q: WHAT DO YOU THINK OF PROPOSALS TO LEGISLATE A SOCIAL SECURITY RESERVE FUND -- TO PUT INTO LAW THE PRESIDENT'S SAVE SOCIAL SECURITY FIRST PROPOSAL?

A: We are encouraged by the overwhelmingly positive response to the President's proposal. But at this point, we don't think legislation is necessary to implement it.

- First, mechanically, if surpluses accrue before Social Security reform is accomplished, they would be used to reduce the publicly held debt. That's the default. But that's also fully consistent with not spending the money until we have achieved reform.
- Second, we don't project significant surpluses before FY 2000 -- so the amounts involved are likely to be small.
- Third, if significant surpluses look likely before we can achieve reform, we would be willing to revisit our formulation and perhaps consider legislation to create an explicit Social Security Reserve Fund.

RECORD TYPE: PRESIDENTIAL (NOTES MAIL)

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

CREATION DATE/TIME: 9-FEB-1998 16:16:40.00

SUBJECT: Revised GCC Testimony

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

READ:UNKNOWN

TEXT:

The attached draft incorporates Gruber's and Peter's comments. I have also made a few changes. There are still a few holes and we need to look carefully at the key sentences that are quotable. I have weakened them--perhaps too much. Why don't we iterate on this before distributing it more broadly.===== ATTACHMENT 1 =====

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

TEXT:

Unable to convert ARMS_EXT:[ATTACH.D92]MAIL48650693F.026 to ASCII,
The following is a HEX DUMP:

**TESTIMONY OF DR. JANET YELLEN
CHAIR, COUNCIL OF ECONOMIC ADVISERS
BEFORE THE SENATE FOREIGN RELATIONS COMMITTEE
ON THE ECONOMICS OF THE KYOTO AGREEMENT
FEBRUARY 11, 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 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 more of a work-in-progress than a completely finished product, 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 global participation and reliance on flexible, market-based measures, that ensure that reductions in global greenhouse gas emissions are consistent with continued strong economic growth. I will do my best also to provide some rough estimates of costs and benefits.

The Administration is strongly committed to ensuring that these critical elements are reflected in our domestic and international climate change policies. We are firmly committed to meaningful developing country participation, as well as 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 to jumpstart our efforts.

I. Basic Economic Rationale of the Kyoto Treaty

To begin our analysis, it may be worth stepping back and examining the larger question of the basic rationale, from an economist's perspective, for the Kyoto Agreement.

The earth's surface is warming from the accumulation of greenhouse gases from myriad sources worldwide. None of these emitters presently pays the cost to others of warming's adverse effects -- a classic externality in the language of economists. As a result of these distorted incentives, disruption of the Earth's climate is likely to proceed at an excessive pace and if left uncontrolled may pose substantial costs in terms of harm to commerce and the environment alike. The fundamental economic logic of the Kyoto agreement is thus that

without such an international agreement, individual nations will not have the proper incentives to address the threats from global climate change.

II. Costs of Climate Change

In evaluating efforts to mitigate global warming, the first step is to consider the costs that are likely if we fail to take any action -- for these costs provide the primary motivation for reducing greenhouse gas emissions.

The Intergovernmental Panel on Climate Change (IPCC) jointly established by the World Meteorological Organization and the United Nations Environment Programme, concluded in 1995 that "the balance of evidence suggests that there is a discernible human influence on global climate." Current concentrations of carbon dioxide, methane, nitrous oxide, and the other so-called greenhouse gases have reached levels well above those of preindustrial times. Of these, carbon dioxide (CO₂) is the most important: net cumulative CO₂ emissions resulting from the burning of fossil fuels and deforestation account for about two-thirds of potential warming from changes in greenhouse gas concentrations related to human activity.

Climatic Impact

If growth in global emissions continues unabated, the atmospheric concentration of CO₂ will likely double relative to its preindustrial level by midway through the next century. As a result of the increased concentration of CO₂, the IPCC estimates that global temperatures will increase by between 2.5 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 larger increases in evaporation than in precipitation over midlatitude land areas, which would result in drier conditions in those regions, especially during summer in North America and Europe.

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 freshwater supplies, and damage to ecosystems and biodiversity.

Economic and Monetary Damages

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 forecasting 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, migration costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss).

A subject of great uncertainty and sensitivity is the "discount rate" that is applied to the benefits of averting future climate change. Such a discount rate is needed if the analysis is to be expressed in monetary terms, because a dollar today is not worth the same as a dollar tomorrow. And since the benefits of stemming future climate change accrue over not only decades but centuries, small changes in the discount rate can produce substantial changes in the results. But the precise discount rate that should be used to evaluate questions as important as the future climate of the planet remains a subject of intense debate. It is safe to say that there is, as of yet, no professional consensus on the issue.

A similar point concerns risk aversion. To what extent are we willing to take chances with our planet? The point applies particularly to catastrophe scenarios. Scientists have thought of many possible scenarios, most of which they are fortunately not yet prepared to pronounce as particularly likely based on current evidence, but which might be truly catastrophic for the planet if they were to occur. There is a strong argument for the Kyoto agreement as a form of planet insurance. But what numerical weight should one assign to these catastrophic risks? In other words, what is the value of the insurance policy? It is difficult for an economist, or anyone, to know.

Despite these shortcomings and potential problems, respected researchers have developed estimates of the monetary damages expected from an average worldwide temperature increase of approximately 4.5 degrees Fahrenheit (corresponding to, roughly, a doubling of pre-industrial carbon dioxide concentrations). For example, William Cline, then a Senior Fellow at the Institute for International Economics, estimated that such a temperature change 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. (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. He finds that the Cline estimate is in the center of three estimates for the U.S., and that the high estimate is only 1.3 times greater than the low estimate.

It must be noted, however, that this similarity of 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. In particular, the estimates may not fully reflect potential non-linearities 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 quantitative analyses do not, and cannot, accurately reflect the small and unknown possibility of large-scale and potentially irreversible discrete events with potentially catastrophic consequences.

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 core samples suggests such changes of ocean currents have occurred in previous ice ages. 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 averse to risk, such possibilities 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

The costs of unabated climate change may thus be difficult to quantify, but they are nonetheless real and provide the motivation for reducing greenhouse gas emissions. In taking action to reduce those emissions, economic analysis suggests that two elements are absolutely essential:

- The effort must be global, to address the global externality inherent in the nature of the problem.
- The effort must be flexible and market-based, to ensure that we achieve our objectives in the most efficient manner possible.

Need for Global Action

Climate change is a global problem requiring a global solution. As I mentioned earlier, no single country has an incentive to reduce emissions sufficiently to protect the global environment against climate change. Each has an economic incentive to “free ride” on the efforts of others. Even if the United States sharply reduced its emissions unilaterally, greenhouse gas emissions from all other countries would continue to grow, and the risks posed by climate change would not be significantly abated. It is important to emphasize that emissions of different gases anywhere in the world have very similar effects on global climate.

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. The first 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 a long-term objective of limiting greenhouse gas concentrations and encouraged the established 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.

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 take substantial steps to stabilize atmospheric concentrations of greenhouse gases. The Kyoto Agreement, which requires the advice and consent of the Senate, would place binding limits on industrial countries’ emissions of the six principal categories of greenhouse gases: CO₂, N₂O, methane, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. **These limits apply to the 38 so-called Annex I countries, which are the industrialized countries, defined to include Russia, Ukraine, and most Eastern European countries.**

Under the Kyoto agreement, each industrial country’s “1990 baseline” is actually based on its 1990 emissions of CO₂, methane, and N₂O and its choice of 1990 or 1995 levels of the other three categories of gases. The United States agreed to a target of 7 percent below 1990 levels by the period between 2008 and 2012. To meet that target, net U.S. emissions of greenhouse gases -- all emissions minus removals of CO₂ by certain forestry-related activities -- must average no more than 1,484 million metric tons of carbon equivalent per year during that period. 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.

The President has made clear that his support of the Kyoto Agreement is dependent on meaningful participation from key developing countries (who are not included in Annex I). The President has also made clear that he will not submit the treaty to the Senate without such participation.

There are several reasons why meaningful participation from developing countries is essential. First, developing countries are projected to contribute a majority of total emissions by 2030 under a continuation of business-as-usual. Without the participation of developing economies, emissions reductions by the industrialized countries will therefore not achieve necessary protection from climate change. Indeed, if developing countries do not participate in the international regime, their emissions could potentially increase by *more* than under their business-as-usual baselines. One mechanism for such an unintended consequence is as follows.

As Annex I countries comply with their targets, their demand for oil will fall, which will probably work to reduce the price of oil on world markets, and perhaps to encourage non-participating countries to use more oil and emit more carbon than they otherwise would have.

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 by U.S. companies domestically. 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 benefit 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.

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 existence of more pressing social needs in such countries will inevitably limit the magnitude of their contributions.

So far I have not mentioned the word "competitiveness." One of the difficulties in analyzing concerns related to competitiveness is that the term itself is used to mean many different things. I have seen at least one study that uses "loss of competitiveness" to refer to predictions of negative effects on the *aggregate* trade balance. As a professional economist, I do not accept the logic upon which that particular argument is predicated: the aggregate trade balance is determined by macroeconomic forces -- the difference between saving and investment -- and not by our environmental policies.

On the other hand, if competitiveness refers to adverse effects on a few specific manufacturing industries -- those that are especially energy-intensive, such as aluminum, paper, and chemicals -- the situation may be more complicated. It is difficult to undergo a significant 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 in Venezuela. Similarly, gas prices were \$3.71 per gallon in Switzerland and \$4.41 per gallon in France. 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. I therefore believe it more accurate to say that we need developing country participation for the reasons I outlined above, than to say that we need it to avoid adverse effects on competitiveness.

Flexibility and Market Mechanisms

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 problem 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, the 2,600 economists urged such approaches in a letter they signed last year advocating action on climate change:

"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."

1. "When flexibility" (timing)

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.

The Kyoto Protocol incorporates this principle of "when flexibility" in four ways:

- First, the cuts to be made in the first period are less severe, and the first period ends much later, than what had been proposed by many other countries, most notably the Europeans.

By adopting a gradual and credible path of reductions in the early years, we can greatly reduce costs such as those from prematurely scrapping coal-fired electricity plants still in the prime of their operating lives, while attaining the same ultimate environmental goals.

- Second, under the Kyoto agreement, the emissions target is not specified in terms of a specific year, but rather in terms of an average over a five-year period (2008-2012). Averaging over five years, instead of requiring countries to meet a specific target each year, can lower costs, especially given an uncertain future. The averaging can smooth out the effects of short-term events such as fluctuations in the business cycle and energy demand, or hard winters and hot summers that would increase energy use and emissions.
- Third, there is allowance for “banking” emission reductions within the 2008-2012 commitment period, for use in a subsequent commitment period [although the emission targets of the next period have not yet been specified].

2. “What flexibility” (gases and sinks)

The second type of flexibility is “what flexibility”, along two dimensions. The first is the inclusion in the agreement of all six greenhouse gases. Emissions of different kinds of gases, not just carbon dioxide, contribute to the greenhouse effect. Since the IPCC has developed conversion factors for all greenhouse gases by estimating their global warming potentials, reductions in emissions of one pollutant can be used to substitute for increases in emissions of another by an amount that has equivalent environmental effects. The Kyoto Protocol stipulates that countries with binding targets are expected to reduce their *total* greenhouse gas emissions by certain percentages, but does not require specific reductions for specific gases. Since a molecule of sulfur hexafluoride is 23,900 times more potent over 100 years than a molecule of CO₂, it may be cheaper to achieve the same environmental benefit by eliminating one molecular unit of SF₆ than nearly 24,000 units of CO₂.

Some initial rough analysis indicates that a strategy of reducing non-CO₂ greenhouse gases by *more* than 7 percent below their 1990/1995 baseline levels while reducing CO₂ by *less* than 7 percent below its 1990 level could reduce greenhouse gas emission permit prices by more than 10 percent. Thus allowing countries flexibility in what gases they reduce -- essentially trading emissions reductions across gases -- can help lower significantly the costs of meeting their targets.

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. Promoting such sinks through afforestation and reforestation may reduce atmospheric concentrations of CO₂ at much lower costs than reducing emissions of greenhouse gases.

3. "Where flexibility" (international)

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 includes two important cost-saving provisions of this nature. First, it provides for industrial countries to trade rights to emit greenhouse gases with each other. This market in emissions 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 -- lowering costs without affecting the level of environmental protection.

Second, 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. Details of these provisions will be worked out in negotiations in Buenos Aires later this year.

IV. Difficulties of Economic Analysis of Kyoto Agreement

Now that we have a Protocol -- even if it is not yet fully complete nor ready for the President's submission to the Senate -- it is possible to examine it in somewhat more detail from an economic perspective. But 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 results should be treated with substantial caution.

The difficulties associated with 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.

Uncertainties over Certain Provisions in International Effort to Combat Climate Change

The 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

don't know.

First, as is often the case in a legal document of the length and complexity of the Kyoto Protocol, there are some provisions that require further clarification and interpretation. Of particular concern here is the treatment of so-called sinks -- activities that affect the rate at which carbon is removed from the atmosphere and "sequestered," specifically by the planting of trees.

Second, the details of a number of items -- primarily concerning international trading and developing countries -- are the subject of further 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.

Finally, and most importantly, we have not yet negotiated international agreements to limit emissions beyond the 2012 window. The emission cuts agreed upon at Kyoto are only a first step on a long journey. The first step that we propose to take over the next 15 years is critical. But the reason it is critical is *not* that, by itself, it will solve the climate change problem -- emissions during any given decade are small compared to the cumulative concentrations in the atmosphere. Rather, the first step is critical because we can't take the second and third steps until we have taken the first. At the same time, any analysis is complicated by the lack of knowledge over what the subsequent steps will be.

Inherent Limitations of Models

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.

One area in which the uncertainty is particularly large is the pace of technological progress -- including diffusion of existing energy-efficient technologies, as well as research and development of new technologies -- and the extent to which the pace will accelerate in response to government programs. Economics does not offer a good understanding of how technological progress is determined, in part because it is the stuff of experimentation, brainstorming, genius, breakthroughs, perceptions and habits. Invention is largely determined by inspiration -- notwithstanding Edison, who assigned a 99 percent share to perspiration -- and inspiration, in my experience, is difficult to fit into mathematical formulae or economic models. Models and experts on climate change policy tend to have a wider range of disagreement on the speed with which technology can be changed and the scope for speeding the diffusion of existing

energy-efficient technologies than on any other single issue.

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 have enough policy detail to distinguish alternative ways of redistributing revenues that would result if emission permits were to be auctioned. Some are capable of showing short-term macroeconomic disequilibria. Some include a long-term “carbon cycle” model that can keep track of the accumulation of greenhouse gas concentrations in the atmosphere and their climatological effects. Some break down the rest of the world into regions and so can model international trade. No one model does everything, and therefore we must not rely blindly on the results of any one model or set of models. Professional judgement and economic intuition are also crucial.

Benefits of Averting Climate Change

As I discussed 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 for you, in light of the difficulties I have enumerated -- including the quantitative uncertainty of these benefits, and their timing and therefore the extreme sensitivity of the results to the chosen discount rate.

Instead, what I will do is draw upon a variety of sources in an attempt to add up the various possible costs and benefits of emissions policy *excluding* climate change. To give away the punch line, 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, *even before taking into account the benefits of averting climate change itself*. That small net premium excluding the benefits of mitigating climate change, in effect, purchases a partial insurance policy against a serious environmental threat.

V. Assessing the Kyoto Agreement

The existence of modeling difficulties means that the results from any model must be treated with caution. We have therefore employed a broad set of economic tools to assess the Kyoto agreement. We have drawn on the insights of a wide 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, and the staff-level Interagency Analytical Team effort last year. Other tools include simple relevant statistics, “meta-analyses” of existing models, historical and sectoral examples, and basic economic reasoning. Drawing on this broad array of analytical tools is crucial to an intelligent evaluation of the policy alternatives.

To my knowledge, as of December, no model -- whether used inside the government or not -- had been set up precisely to analyze the parameters of the agreement that was reached in Kyoto. Most model-builders outside the government tend to take as long as several years to incorporate changes in policy parameters into their models. And no model is currently designed to assess sinks, or all six greenhouse gases included in the treaty.

One of the leading models in the field is the Second Generation Model of Battelle Laboratories. 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 a starting point for a preliminary 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 and a possible Annex I trading scheme that could exclude the EU. I will share with you today some preliminary results of this analysis.

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. Much of this work will continue to go on outside the government. For example, we have had discussions with the Energy Modeling Forum, based at Stanford University. The EMF is a long-running exercise involving many of the leading climate models. We have given the EMF advice on how features of the Kyoto legal language can be translated into terms recognizable to an economist. Unfortunately, the Energy Modeling Forum believes that its members will need at least until mid-year to produce reliable results.

VI. Economic Analysis

With all of that as important background, let us now turn to the task at hand. As we do so, let me emphasize once again that the figures presented below do not incorporate the benefits of starting to mitigate climate change.

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 mechanisms are used. Our economic analysis highlighted the importance of such flexible, market-based mechanisms -- which are therefore reflected, at the President's insistence, in the Kyoto Agreement and our approach to the effort.

Within the Kyoto agreement, this means an insistence on international trading, joint implementation, and, ultimately, on full developing country participation. Domestically, this means that we implement any emissions reductions through a market-based system of *tradeable* emissions permits, which ensures that we achieve reductions wherever they are least expensive. But this also means taking serious and responsible steps in the short run to prepare us to meet our

obligations in the longer term.

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 credits of \$3,000 to \$4,000 for consumers who purchase highly fuel efficient vehicles, a 15 percent credit (up to \$2,000) for purchases of rooftop solar equipment, a 20 percent credit (subject to a cap) for purchasing energy-efficient building equipment, a \$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 \$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 FY99, the combined proposal for PNGV is \$277 million, up from \$227 million appropriated in FY98. Similar government-industry efforts are proposed to develop more efficient diesel engines for both light trucks and heavy trucks. [ADD SOMETHING MORE ABOUT INDUSTRY-GOVERNMENT DIALOG. PERHAPS A CONCRETE EXAMPLE OF IDENTIFYING AN INDUSTRY REGULATION THAT COULD BE REMOVED.]

The second such 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. A reasonable overall estimate of the effects of adding federal electricity restructuring to the rest of the President's program to address climate change is to achieve the same environmental goals at a cost saving of roughly \$16 billion per year.

Estimated Reduction in Costs from Annex I Trading

In the language of the treaty, "Annex I," you will recall, is the set of countries that have agreed to take on binding limitations in emissions of greenhouse gases. Even without developing country participation -- which, again, the President has emphasized as essential before the treaty would be submitted for ratification -- costs would be reduced substantially by trading among the Annex I countries. To provide some indication of the possible efficiency improvements, Russia and the Ukraine consume six times as much energy per dollar of output as does the United States.

Estimates derived from the SGM model suggest 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 costs is meant to capture aggregate resource costs to the US economy, including the cost to domestic firms of purchasing emission permits from Russia and other countries where emission reductions are cheaper than in the United States. The dramatic reduction in costs available from Annex I trading within the SGM model -- cutting the costs involved by half -- highlights why the President insisted that international trading be part of the Kyoto Agreement.

Estimated reduction in costs from umbrella trading

One possibility that emerged in Kyoto, which none of us foresaw, was the idea that the United States might undertake trading with a subset of Annex I countries, dubbed the "umbrella," that would exclude the European Union. The initial list of proposed participants in the umbrella includes the United States, Australia, Canada, Japan, New Zealand and Russia, with strong indications of interest from some others. The motivation for this idea was that the Europeans have been reluctant to agree to the sort of international trading that we want (preferring that they achieve their goals collectively in a group of their own, called the "EU bubble").

It is too early to say whether the umbrella concept will in fact be accepted by the parties. But it is an important concept to consider, for three reasons. First, it is conceivable that it will be formally agreed to in future negotiations. Second, even if the final treaty does not explicitly include the umbrella, but rather allows trading among all signatories (as the United States has proposed all along), it is conceivable that umbrella countries will agree, outside the treaty, to trade only among themselves. Third, the aversion toward international trading that the Europeans have expressed suggests that they might refrain from making the trades to which they would be entitled -- which would mean that the umbrella would operate in practice, if not in formal international agreement.

The significance of the umbrella idea in the present context is that it has the potential to further reduce costs to the United States. The reason is that if the Europeans do not bid against us for the relatively abundant, low-cost opportunities to reduce emissions in Russia and Eastern Europe, then the price of emissions reductions will be even lower. 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 arrangement would reduce costs by an estimated 60-75 per cent, depending on whether the former Warsaw Pact countries are classed with the EU, or are instead assumed to fall within the umbrella.

Estimated reduction in costs from LDC participation

The next consideration is participation by developing countries. The President has said that he will not submit the treaty for ratification without such participation -- which would

further reduce the costs involved.

The substantial potential gains from meaningful LDC participation are highlighted by the significant benefits that will likely accrue even from the limited role that the LDCs have already agreed to: the Clean Development Mechanism, modeled after Joint Implementation (JI).___JI cannot realistically be expected to yield all the gains of binding targets for developing countries, but it might shave costs by roughly another 20 to 25 percent from the reduced costs that result from trading among Annex I countries.

Another possibility is that we persuade some of the key developing countries that are the largest emitters to commit to targets, and allow us to buy emission reductions from those paths. We estimate that this could cut roughly 55 percent off the reduced costs that result from Annex I trading. [The four countries included in this particular estimate are China, India, Brazil and Korea.] Once these savings have been attained, the estimated reductions to US costs from persuading the rest of the developing world to go along with full commitments are relatively small.

A useful rough check on our estimate of the gains from international emissions trading can be obtained from other modeling efforts, notwithstanding that they are likely to be more distant approximations to the parameters of the Kyoto Treaty. Recent results from six leading models that participated in the Stanford Energy Modeling Forum show that worldwide permit trading would reduce the estimated costs -- defined as lost consumption -- of a full, long-term, global program to stabilize atmospheric concentrations at 550 ppmv by an average of 56 percent, although the results vary from model to model.

I offer these numbers because they show the potential effectiveness of trading in reducing costs dramatically. But it is important that I repeat three caveats: First, as always, there is a wide range of uncertainty around all these estimates. Second, they apply to an idealized version of trading, one that assumes no problems of enforcement or transactions costs. Third, it seems unlikely that we will convince all of our partners to agree in Buenos Aires to the most complete and cost-effective international trading arrangements. Nonetheless, despite these caveats, the numbers still show major savings.

Moreover -- and I can't highlight this enough -- these cost-saving features are fundamental tenets of the U.S. position for ratifying the Kyoto Protocol. If we do not get very solid provisions for international emissions trading and 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 going into Buenos Aires.

VII. Non-Climate Benefits

The costs of undertaking greenhouse gas emission reductions must be compared to the benefits. As I have indicated, for various reasons our analysis does not quantify the benefits from averting climate change itself. But the relative price shifts that are necessary to reduce emissions should produce benefits in three areas: air pollution, traffic congestion, and highway accidents. These benefits are quantifiable. The magnitude of these projected benefits would vary with the permit price.

Reductions in carbon emissions also lead to reductions in emissions of pollutants that contribute to excess concentrations of fine particulate matter and low-level ozone. We estimate significant ancillary reductions of nitrogen oxides and other pollutants and associated cost savings even for low carbon prices. These cost savings be even larger if carbon emissions reduction efforts could be carefully coordinated with the implementation of the national ambient air quality standards.

Traffic congestion hurts motorists by causing delays and inconvenience. More efficient pricing -- which recognizes the externalities involved -- should lead to reductions in congestion as motorists choose other means of travel, share rides, or even forgo less important trips.

Vehicle use also leads to costly accidents and to highway injuries including fatalities. More efficient efficient pricing will reduce use and create savings from reduced accidents and resultant mortality. The savings from reduced congestion and reduced accidents are significant, even with low carbon prices.

A variety of other benefits that are harder to quantify are likely to result from reductions in carbon emissions. With respect to transportation, reduced vehicle use will also reduce the cost of road repair and maintenance. Second, reduced coal use will lower mercury emissions. Finally, reduced energy use will also increase U.S. energy independence. Our inability to estimate these effects quantitatively does not imply that they are necessarily small or unimportant.

VIII. Preliminary Estimate of the Net Effects of the Kyoto Agreement

We can now combine the various benefits and costs delineated above to provide a preliminary assessment of the likely net impact of the Kyoto agreement, excluding, however, the benefits of averted damage from climate change and several other cost mitigating factors, such as sinks and payoffs from proposed Administration climate change initiatives. This assessment entails a very careful evaluation of results from the SGM model as well as my own professional judgement and additional Administration analysis to match the results from the model with the institutional details of the Kyoto agreement. It accounts for the impact of trading under the umbrella, and assumes full participation by four key LDCs. The conclusion is that the resource

costs of attaining our Kyoto targets for emission reductions might amount to \$7 to \$9 billion. Adding in the ancillary, non-climate benefits overall net costs could reach \$5 billion to \$8 billion, or roughly 0.08 percent of projected GDP.

A more tangible measure of costs is the estimated effects on energy prices. Excluding the impact of electricity restructuring, and our SGM-based estimate is that the price of emissions could be as high as \$12 to \$16 per ton of carbon equivalent -- and that energy prices at the household level could rise by about 3 percent under the Kyoto accord. Fuel oil prices could rise by about 6 percent, natural gas prices by 4 percent, gasoline prices by 3 percent, and electricity prices by 3 percent. A 3 percent increase in energy prices at the household level would raise the average family's energy bill by about \$75 per year.

These estimates do *not* mean that households' energy expenses will in fact be higher in 2010 than today, however. In the first place, energy prices fluctuate year-by-year for all sorts of reasons. They could go either up or down. But even if we leave out unpredictable fluctuations, the energy price declines from Federal electricity restructuring would be enough to offset the impact estimated above. By 2008-2012, the projected 10 percent decline in electricity prices from the restructuring that is part of our climate change agenda will mean a net reduction in electricity prices in the U.S., even accounting for the small increases noted above.

As highlighted earlier, estimates of the type that I am presenting are fraught with uncertainty. The estimate I just discussed was predicated on the developing country participation that we will insist upon in Buenos Aires as a condition for our ratifying the Kyoto Protocol, but which is not yet part of that Protocol. At the same time, the numbers I have cited are in several respects conservative: they leave out several factors, such as the role of sinks, that could further reduce costs. But before I bring these factors into the analysis, allow me to say a few words about macroeconomics.

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 no warning, as happened in the oil crisis of 1973-74, when the real money supply, output and

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

IX. The Foregoing Estimates Are Conservative Along Several Dimensions

I should emphasize that the estimates I have presented are conservative in the sense that they do not include three factors: the potential cost reductions resulting from the inclusion in the Kyoto treaty of carbon sinks, the potential payoffs to the President's technology or energy efficiency initiatives, or the benefits of mitigating climate change itself. The first omission, sinks, concerns a provision of the Kyoto Protocol that has received less attention than it merits. It is only *net* emissions -- emissions to the atmosphere minus sequestration -- that are to be reduced 7 percent below 1990 levels, not gross emissions. 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 provision on sinks indicates 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%.

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 half or more, 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, possibly through some version of the USDA's Conservation Reserve Program, for example.) But neither we nor other analysts are yet sure exactly how to interpret the legal language of the Protocol. 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 modelling the Kyoto provision pertaining to sinks is likely to be both favorable and large.

The estimates I have cited so far also make little allowance for the payoff to the President's \$6.3 billion Climate Change Technology Initiative. The parameter that figures most prominently in analysis of technological progress in the energy field 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. In the SGM model analysis that underlies our assessment, the AEEI is assumed to improve by 1.0 percent per year. Reflecting a conservative interpretation of

the 15-year impact of the technology initiative, this is only a small increase above the 0.9 percent number in the Energy Information Administration's Annual Energy Outlook.

Our justification for incorporating into our assessment 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 have conservatively assumed that there will be substantial lags in producing payoffs from new technology research and dissemination expenditures.

Clearly, this is neither the best outcome the Nation *can* attain nor the best outcome the Administration *expects* to attain as a consequence of our climate change strategy over the next decade. Many energy technology experts forecast more rapid technological progress; and engineering models suggest that some energy improving technologies are available now at negative costs.

If the Administration is successful in speeding the discovery and adoption of new technologies, 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 improvement suggest an increase in the AEEI from 1.0 to 1.25 would be reflected in about a 40% decrease in the permit price.

Our preliminary estimates do not fully reflect potential entrepreneurial response to appropriate incentives. An instructive example of the ability of U.S. industry to perform beyond expectations when given appropriate economic incentives is EPA's highly acclaimed sulfur dioxide (SO₂) program, which relies, among other things, on a system of tradeable permits to reduce emissions of SO₂ from electric utilities. The SO₂ program has been successful in several ways: a large number of utilities participate, SO₂ emissions and ambient concentrations have fallen and the costs of reducing emissions are considerably lower than originally forecast.

As has been frequently noted, the average cost of SO₂ emissions reductions has recently been significantly lower than was originally forecast, in part due to the role of incentives in fostering innovation. Emission permit prices, currently at approximately \$100 per ton of SO₂, are well below earlier estimates of around \$250 to \$350 per ton.

Trading programs may not always bring cost savings as large as those achieved by the SO₂ program; trading programs will not always be accompanied by the discovery of much cheaper control strategies. However, the SO₂ experience demonstrates clearly how programs that offer important market incentives to find cheaper ways of reducing emissions can lead to unexpectedly low prices.

The final, and most important factor that has been left out of the estimates I have presented 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.

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.

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.