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6/17/97

There is no more serious issue than climate change, and it is clear that we will need to seriously and significantly reduce our emissions of greenhouse gases beginning with a strong agreement in Kyoto. But the step we take in Kyoto, no matter how stringent, will not solve this problem.

We must remember that our goal is to stabilize the concentrations of greenhouse gases in the atmosphere at an acceptable level, a task that must begin now, but which will require continuing sustained effort over the next decades. So it is important, in Kyoto, that we set up a system that will work -- one that will allow us to reduce our emissions at the lowest possible cost so that we can achieve the maximum protection of the environment. And it is also important that our agreed target send a clear enough signal of our intent so that governments and industries can make significant investments in the new technologies that will be required if we are to achieve our ultimate goal. And finally, although those of us in the developed world who emit the largest quantities of these gases must take the lead, all must participate in moving toward the solution.

Alicia 6/17/97
materials for
Climate Change

Janet

WHITE HOUSE STAFFING MEMORANDUM

DATE: 6/16 ACTION/CONCURRENCE/COMMENT DUE BY: 6/17 2:00 pm

SUBJECT: Climate Change

	ACTION	FYI		ACTION	FYI
VICE PRESIDENT	☒	☐	McCURRY	☐	☒
BOWLES	☒	☐	McGINTY	☐	☐
McLARTY	☐	☐	NASH	☐	☐
PODESTA	☒	☐	RUFF	☐	☐
MATHEWS	☒	☐	SMITH	☐	☐
RAINES	☐	☐	REED	☐	☐
BAER	☒	☐	SOSNIK	☒	☐
ECHAVESTE	☐	☐	LEWIS	☒	☐
EMANUEL	☒	☐	YELLEN	☒	☐
GIBBONS	☒	☐	STREETT	☐	☐
IBARRA	☐	☐	SPERLING	☒	☐
RADD	☐	☐	TARULLO	☐	☐
HIGGINS	☐	☐	VERVEER	☐	☐
HILLEY	☒	☐		☐	☐
KLAIN	☒	☐		☐	☐
BERGER	☒	☐		☐	☐
LINDSEY	☐	☐		☐	☐

REMARKS:

Please advise

RESPONSE:

'97 JUN 16 PM5:57

THE WHITE HOUSE
WASHINGTON

June 16, 1997

MEMORANDUM FOR THE PRESIDENT

FROM: KATHLEEN A. MCGINTY
DANIEL K. TARULLO

SUBJECT: UPCOMING INTERNATIONAL EVENTS AND CLIMATE CHANGE

I. Action-Forcing Event

Over the next few weeks, you will have two high-profile events that focus attention on U.S. climate change policies: the Denver Summit of the Eight (June 20-22) and the United Nations General Assembly Special Session on Environment and Development (you are speaking on June 26). To date, the United States has called for binding emissions targets, flexibility in meeting those targets and the participation of all countries under the climate treaty, but has not signaled which specific emissions levels would be acceptable. Negotiations are set to conclude this December in Kyoto. Other countries and domestic constituencies are calling on the U.S. views to state its views.

Your advisers are evaluating the specifics of a U.S. negotiating position, with some differences among them. However, there is a consensus that, even at the cost of significant criticism from other countries and environmental groups, it would be imprudent to take a specific position on emissions levels in the upcoming events. Instead, you should begin an intense process of personally communicating with the American public on this issue.

II. Background

Climate change may be the most significant economic and environmental policy issue to be addressed in the second term. There is now scientific consensus that human activities (primarily the burning of fossil fuels) are having a discernible influence on the global climate and that "climate change is likely to have wide-ranging and mostly adverse impacts on human health". The implication is that greenhouse gas concentrations have to be held to responsible levels in the long term to avoid dire consequences. Greenhouse gas concentrations are at now their highest levels in 200,000 years and, absent policy interventions, concentrations at the end of the next century are predicted to be at a 50 million year high. Impacts are predicted to include higher temperatures (global average temperatures are predicted to increase 2-6.5 degrees F. by 2100), sea level rise (threatening low-lying areas), spread of infectious diseases, and more highly variable weather (with increased frequency of severe weather events such as droughts and floods).

The U.S. is the world's largest emitter of greenhouse gases, with roughly 25% of the world's total. Domestic greenhouse gas emissions have been growing by a bit over 1 percent per year, so that today's emissions are about 10 percent higher than in 1990. In many developing countries, emissions growth rates are higher, but per capita and overall emissions levels are lower. The developed countries are responsible for much of the accumulation of greenhouse gases in the atmosphere and currently are the largest emitters. By 2020-2040, however, the developing countries will surpass the developed countries in terms of emitting greenhouse gases. Since global climate is affected by greenhouse gases concentrations in the atmosphere, and since the efforts by any one country to reduce its emissions cannot have much of an effect on global concentrations, a sensible approach would call on all countries to play a role. The U.S. has urged developing countries to accept significant obligations (short of quantitative emissions targets) in the international treaty negotiations. To date, there has been little international support for the U.S. position on developing countries.

In general, market-based policies are believed to be the most efficient means to reduce greenhouse gas emissions, because these policies promote flexibility and minimize economic costs. The U.S. has urged that the climate change treaty promote maximum domestic flexibility in all countries, establish a system where countries with quantitative emissions targets can trade emissions rights, and establish a system of joint implementation, where developed and developing countries can undertake joint efforts to reduce emissions wherever the cost is lower.

When faced with a specific set of choices for the U.S. position on emissions levels under the climate treaty, most of your Cabinet supported "stabilizing emissions in the medium term." (In the parlance of the climate change negotiations, "stabilizing" means returning greenhouse gas emissions to 1990 levels and "medium term" means 2005-2020). Many of the agencies and offices represented conditioned their support on success in achieving other elements of the U.S. negotiating position (e.g., international emissions trading, participation of developing countries).

However, as several of your economic advisers noted, the seemingly moderate goal of returning emissions levels to 1990 levels by 2010 could entail economic policy interventions greater than any we have undertaken during your Presidency. Even with the kind of flexibility components proposed by the United States, market-based policies designed to reduce greenhouse gas emissions significantly are likely to raise domestic fuel prices by significant amounts and to have particularly adverse effects on the coal industry. The likely result is a reduced level of economic activity, at least in the first few years after implementation. Thus, emissions control policies have the unfortunate effect of imposing short term economic costs in order to achieve distant (though potentially enormous) environmental benefits.

In the view of some of your advisers, there is strong evidence that total costs could be lowered significantly if policies were put in place to emphasize investment in productivity-enhancing technologies. Some of the technologies envisioned would not have a major impact by 2010, but could have significant impact in the decade that follows. An expanded program of research and policies encouraging innovation could have low costs and achieve broad political support.

The politics of this issue are difficult, at best. For many environmental groups, strong action on climate change is a litmus test of your environmental policy. If you fail to speak decisively on this issue at the Summit or the UN General Assembly Special Session, their criticism will be intense. European leaders such as Blair and Kohl will probably be both ambitious in their proposals and critical of our lack of specifics. On the other hand, much of the business community is strongly opposed to action that would significantly reduce greenhouse gas emissions in the short term. Fossil fuel and heavy manufacturing companies are poised to attack any policies that might be supported by environmental groups. Organized labor is increasingly opposed to strong actions, as well, largely in deference to the concerns of the United Mine Workers. Farmers are likely to oppose any policies that would increase energy prices. Southern and western Republicans in Congress are very skeptical about policies to constrain greenhouse gas emissions, as are Midwestern and coal state Democrats. Indeed, Senator Byrd currently has 45 signatures on a resolution requiring developing country obligations before U.S. agreement in Kyoto.

III. Recommendation

Your advisers believe that the American public is not prepared for far-reaching proposals that could substantially increase fuel costs. They believe it is necessary to undertake a serious educational effort to convince the American public that climate change is an important long-term issue that requires the United States to institute policy changes. Such an effort should be an interactive process, with you and your Cabinet members taking lead roles in listening to the public, elected officials, and interest groups, and then fashioning an appropriate policy response. Your advisers believe that such a process is necessary to develop a workable political consensus in the country for an effective climate change policy. If this consensus is not achieved, it will be virtually impossible to have an international climate change treaty limiting domestic greenhouse gas emissions ratified by the Senate in the foreseeable future.

Your advisers recommend that you address climate change at both the Denver Summit and the UN General Assembly Special Session. At Denver, as you have done in the past, you should discuss the subject in strong terms, noting that the science is quite clear on the scope of the climate change problem. You also should note that there are extensive differences in the various proposals made to begin the process of achieving a solution. You can sketch out the importance of creating a long-lasting framework for implementing worldwide climate change policies, because this is an issue of vast scope (covering many decades and all the countries on the earth). And you can call on the Eight to work together to ensure that the treaty negotiated at Kyoto is acceptable to all members.

At the UN General Assembly Session, your advisers recommend that you begin to outline your personal involvement in the education campaign that will be necessary to build domestic acceptance for any meaningful emissions constraints. Although gaining consensus across the political spectrum is not possible on this issue, it may be possible to enhance support significantly among centrist constituencies and the public at large. Notwithstanding that you are speaking to a UN audience, you should direct your remarks to the American public.

You could announce specific means to pursue this dialogue, including your plans to host a White House Conference on Climate Change in September to bring together elected officials, business, labor, and environmental and scientific leaders, academics, and representatives of the public to discuss climate change policy. You could announce further that this White House conference would be preceded by a series of regional conferences that will offer greater public participation and involve the entire Cabinet in the process. These high-level conferences would serve to educate the American public and bring forward ideas on how best to address climate change. A core goal of this and other efforts would be to break through to the American people with the message that "Bill Clinton is working on climate change." Meanwhile, analytic work on policy alternatives would continue, informed by the public debate. We would aim to arrive at a complete U.S. negotiating position by the early fall.

You should be aware that this approach may lead to intense criticism of you and the Vice President by environmental groups. Your climate change policies will likely be equated with those of President Bush at the Rio Earth Summit. (Bush refused to agree to any emissions levels at Rio. You reversed that position in April, 1993 and voluntarily committed the U.S. to reducing emissions to 1990 levels by the year 2000). However, your advisers believe that refraining from announcing specific goals until early fall is necessary to develop the political and public consensus required to undertake any meaningful policy action on climate change. The alternative set of actions (making statements in the next few weeks supporting emissions constraints perceived as strong) would lead to harsh and lasting criticism from business and labor, in the opinion of your advisers. The resulting public and Congressional reaction could be so severely negative that you might be unable to take any significant policy steps on climate change. Moreover, criticism from these sources also could place other policy initiatives (environmental and others) in jeopardy.

Several appendices provide additional information. Appendix A lists five options identified to the Cabinet for specific statements on climate change. The options are arrayed in order from most stringent to least stringent, spanning the range of possible policies that could be developed by the early Fall. Material analyzing the projected environmental impacts of these options is attached as Appendix B. Material summarizing the projected economic impacts of Options 1, 2, 3 and 4 are presented in Appendix C. Additional background material on climate change (including a discussion of domestic policy options) is attached as Appendix D.

IV. Decision

That you approve the course outlined above.

_____ Approve

_____ Disapprove

_____ Discuss

Climate Change Roll-Out:

President Engages the American Public

Overall Goal: Show the American public that President Clinton is determined to combat climate change in a way that deserves broad support.

Overall Strategy: 3 Pronged Approach

1. President's Vision Set Forth at UNGASS
2. Engage American Public in National Dialogue
3. Outreach to Policy Community

1. President's Remarks at UN Kick-off 3 Month Campaign

Goal: Set President's vision for approaching climate change and begin national dialogue, drawing business, labor and environmentalists into a cooperative process on how best to move forward.

Message:

- America has played an important role in this century for a peaceful and prosperous world. There are new challenges on the horizon for the 21st century. As America prepares to enter the 21st century, we are committed to improving our public education, advancing free trade, and beginning the transformation to a more sustainable environment.
- Climate is our most important global environmental challenge as we approach the 21st century. Risks of inaction are high and unacceptable: Increased storms, droughts and heat waves; increased sea level rise; more spread of infectious disease; problematic agricultural shifts; loss of forests and ecosystems. Costs of action are low and manageable, provided that policies are flexible and market based and that technology is deployed. Waiting isn't the answer because it makes the job harder to solve.
- I know the economy and how to create jobs. I am going to promote America's economic future and enhance the prospects for American workers. And I am going to find a way to address climate change effectively. We can do both.

- The path forward is clear: we need an effective international policy to control emissions. We're committed to maximum flexibility for businesses so we can achieve the greatest environmental benefits at the lowest cost.
- I need the business community to step forward to work with us to find solutions. We need honest dialogue and a common vision. We need pragmatic steps now and ambitious goals for the future. We need to turn our technological prowess into an engine for change in abating greenhouse gas emissions. We can do this together, if we set our minds to it.
- Today, I'm asking every American to consider being part of this solution. Over the coming weeks, I'm asking the Vice President and my cabinet to engage in a new dialogue with the American public to find a common vision on the policy solutions required. I want them to report back to me at a White House Conference in early September with their findings on how best to move forward. I know that with the strength of the American spirit, the ingenuity of industry and the dedication to our children, we will meet this new challenge.

2. Engaging the American Public in a National Dialogue

Goal: Elevate public understanding of importance of changing climate and build support for national policy priorities developed cooperatively through open dialogue with range of affected constituencies.

Message: We're serious about addressing climate change problems. We can meet the challenge better by working together than apart. We want to share what we have learned about climate science, economic impacts and opportunities, and possible policy alternatives. We want to listen to your views and incorporate them into our decision making.

Strategy:

- POTUS: 3 radio addresses; message-of-the-day events; schedule one time slot per week in July/August/September for briefings and outreach.
- Conduct three regional conferences leading to a White House Conference. Three to five cabinet members and senior White House staff would participate in each. (Include mix of Albright, Rubin, Daley, Browner, Peña, Glickman, Babbitt, Shalala, Richardson, Witt, McGinty, Sperling, Tarullo, Gibbons, Yellin, etc.)
- Conferences conducted in roundtable format, chaired by senior Cabinet members. Each would begin with key presentations, followed by open dialogue. Open to press and encourage live C-Span coverage. Conduct press backgrounders before and after.

- Involve regional corporate CEO's, academics, environmental & labor leaders, governors, other state & local leaders, and members of Congress.

Locations: All conferences would be comprehensive, but each would have a special focus, tailored to region.

East: New Orleans, Charleston, Miami, or the New Jersey shore. Highlight: Coastal storms damage, infectious disease risk and forest system impacts in southern and eastern states.

Mid: Columbus, Detroit, Chicago, or Indianapolis. Highlight: Agriculture shifts, coal community impacts, heavy manufacturing impacts and opportunities.

West: Sacramento, Phoenix, Portland, Seattle or San Francisco. Water resource conflicts, public lands impacts, technology response opportunities.

National: White House/DC, Baltimore, Richmond, New York. Comprehensive integration of concerns into a need and pathway for action. Include panel of Nobel laureate scientists and economists.

Considerations: Regional media, negatively effected communities, progressive business response, environmental impacts.

3. Outreach to the Policy Community

Goal: Engage policy community (CEOs in particular) in design of policies to garner their support.

Message: We need your help. Work with us, and we will work out solutions you can live with.

Strategy: Series of CEO meetings with POTUS, VP, Cabinet members & other senior staff.

- Offer our policy inclinations, get feedback and ask for their ideas on what's missing.
- President and VP should each reserve 10 - 12 slots for climate orientation briefings and meetings with industry leaders between now and labor day, as well as three weekly radio addresses by end of September. Cabinet members should be given key responsibilities for pieces. Should schedule in close coordination with other meetings. Also encourage members to host at least one public meeting and make a major speech.

- We should still consider an open meeting with the Washington, DC policy community on peer-reviewed economic analysis and other information to be used in the regional conferences.

Considerations: Ties to PCAST R&D review, electricity sector restructuring, air quality rules, etc.

Notes:

Resources:

- In order to implement the strategy effectively, we need to significantly upgrade our outreach effort. It will take significant financial and staff resources to conduct preparations and carry out events and follow up. White House communications and advance personnel could contribute expertise in planning this education drive. In addition, principals would need to make time available for preparation, speeches, roundtables, etc.
- Up to \$2 million (rough estimate) would be required for the regional and White House conference. We will need to designate a central coordinating facility to augment the White House Climate Change Task Force on this project.

Orientation: In order to jump start the process, it will be necessary to have a half-day orientation session for principals, perhaps at the Vice President's residence or the Blair House. This would cover science, economics, technology, and policy options. This would happen in early July.

Suggested Timeline:

June 23:	VP hosts Congressional Dinner
June 24-7:	OSTP South East Regional Workshop (Vanderbilt)
June 25:	VP Attends OSTP Impacts Workshop (Nashville)
June 26:	President Speaks at UNGASS
June 27:	President with CEO's of Big 3 automakers
July 9:	Public Release of Analysis
July 14-16:	OSTP North West Regional Workshop (Seattle)
July 27:	Eastern Regional Meeting
August 17:	Mid Regional Meeting
August 31:	Western Regional Meeting
September 3-5:	OSTP New England Regional Meeting (U of New Hampshire)
September 21:	White House National Conference
September TBD:	President's Remarks to UNGA (?)
Nov. 10-12:	OSTP National Impacts Workshop at NAS

DRAFT

APPENDIX A POSSIBLE OPTIONS FOR DIRECTIONAL STATEMENTS

Last week, we identified several options for principals concerning the U.S. position on emissions levels in the international climate change negotiations. Each option was defined in terms of a broad directional statement and further described by a particular combination of emissions levels and timing, to help clarify the consequences of the directional statement.

You should note that in the parlance of the climate change negotiations, “stabilizing” means returning greenhouse gas emissions to 1990 levels and “medium term” means 2005-2020.

The five options we identified are:

Option 1: Call for “significantly reducing emissions in the medium term.”

Such a statement would be interpreted to be consistent with the E.U. proposal (a 10-15% cut from 1990 emissions levels by 2010).

Pros:

- Environmental benefits could be large. EPA estimates non-climate benefits (such as reducing fine particles and ozone) would be tens of billions of dollars.
- Many environmental groups would be pleased.

Cons:

- Could impose very large costs on the U.S. economy. Although these effects might ultimately be offset, GDP in 2005 could be reduced by 0.1-1.0% (with international emissions trading) and 0.1-2.0% (without). The price of gasoline could rise by 20-25 cents per gallon (with international emissions trading) to 35-50 cents (without).
- If program were implemented through a domestic emissions trading program in which all permits were auctioned, permit revenues could be in the range of \$110 billion (with international trading) to \$270 billion (without). (Annual permit revenues is not a measure of economic loss, but is one indicator of structural changes in the economy. A domestic implementation scheme could be designed to raise *no* permit revenues).
- Business and labor would be very strongly opposed.
- Without significant changes in the political landscape, the prospects for ratification by the Senate in the next several years would be close to zero.

Option 2: Call for “stabilizing emissions in the medium term and reducing thereafter.” Emphasize that flexibility and the participation of all nations (including developing countries) are essential to addressing this problem.

This option is consistent with stabilizing emissions at 1990 levels by 2010 (though, as noted, “medium term” is interpreted as being between 2005 and 2020).

Pros:

- Allows you to take the high ground: committing the U.S. to meaningful emissions reductions, while insisting on other principles we consider vital to an agreement.
- Provides considerable flexibility for future development of our position. This option is consistent with stabilizing emissions at 1990 levels anywhere between 2005 and 2020.
- Environmental benefits (both climate and non-climate) could be significant. EPA estimates non-climate benefits (such as reducing fine particles and ozone) would be tens of billions of dollars.
- Some environmental groups would be pleased; others would complain of lack of U.S. leadership.

Cons:

- Overall economic impacts of this option could be significant. Although these effects might ultimately be offset, GDP in 2010 could be reduced by 0.2-0.6% (\$20-60 billion) and consumption by .3-1.0%. The price of gasoline could rise by 10-15 cents (with international emissions trading) or 20-40 cents (without).
- Dislocation in some sectors and regions (especially coal states) could be large and long-lasting.
- If program were implemented through a domestic emissions trading program in which all permits were auctioned, permit revenues could be in the range of \$60 billion (with international trading) to \$190 billion (without). (Annual permit revenues is not a measure of economic loss, but is one indicator of structural changes in the economy. A domestic implementation scheme could be designed to raise *no* permit revenues).
- Most business and labor groups would be opposed, although some might support if the policy were coupled with other features they find attractive.
- Without significant changes in the political landscape, the prospects for ratification by the Senate and passage of implementing legislation in the next several years would be poor.

Option 3: Call for “*beginning* to reduce emissions by 2005 and stabilizing emissions by the end of the medium term, with further reductions thereafter.”

This option envisions an international regime that mandates starting emissions reductions earlier than Option 2, but reducing emissions to 1990 levels over a longer period of time. While less constraining than Option 2, the rhetoric used to describe this option (other than the 2005 component) could be substantially identical to the rhetoric for Option 2.

Pros:

- Delaying the most stringent reductions would reduce economic costs, by allowing capital stock to turn over at a natural rate and technology to improve.

- Calling for concrete action before 2010 could be portrayed as more activist. Some agencies (not including the State Department) believe this could enhance our efforts to obtain agreement on international emissions trading and developing country participation.

Cons:

- Would be criticized by environmental community as showing lack of leadership by delaying stabilization.
- Would be criticized by moderate business groups (e.g., chemical companies, some utilities) who strongly oppose any target before the year 2010.
- Would be criticized by more hard-line business groups (fossil fuel producers, heavy manufacturing) and many in organized labor who oppose any action on climate change.
- In the view of the State Department and other agencies, would jeopardize our ability to achieve flexibility provisions (e.g., international emissions trading, joint implementation) and developing country participation in international negotiations.
- Without significant changes in the political landscape, the prospects for ratification by the Senate in the next several years would be poor.

Option 4: Call for “eliminating emissions *growth* in the medium term, on the way to stabilization and eventual reduction of emissions.”

For example, emissions would peak in 2010-2020, return to 1990 levels in the longer term (i.e., after 2020) and decline thereafter.

Pros:

- Economic costs would be relatively mild. Some economists would view this emissions path as consistent with one that would balance costs and benefits of climate change policy.
- Opposition in the business and labor communities would be mild.
- There is a chance an option along these lines would be ratified by the U.S. Senate in the next several years without major political changes.

Cons:

- With this option, there is no chance of obtaining international agreement on our “flexibility” or “developing country participation” proposals.
- Criticism from other countries and U.S. environmental groups would be very strong. Environmental groups would equate your performance in New York with George Bush’s performance at the 1992 Rio Earth Summit.
- Environmental benefits (both climate and non-climate) would be modest.
- Some economists (especially those who emphasize the environmental benefits of climate change policies) would criticize this option as inadequate.

Option 5: Call for “strong action on climate change” and “agreement in Kyoto.” Say that the United States is continuing to study the issue of emissions levels and will elaborate on its position at a later time.

This roughly repeats prior statements by you and other administration officials.

Pros:

- Leaves options open for future decisions.
- Allows additional refinement of economic modeling runs before our position is announced.

Cons:

- Would be strongly criticized by environmental groups, who would equate your performance in New York with George Bush’s performance at the 1992 Rio Earth Summit.
- Without more definition of our position on emissions levels soon, our ability to achieve agreement to flexibility and developing country provisions in Kyoto will be seriously impaired.

APPENDIX B ENVIRONMENTAL IMPACTS OF OPTIONS

1. Climate Change Impacts

Absent policy interventions, atmospheric greenhouse gas concentrations will increase during the next century to levels unknown on this planet for 50 million years. To avoid such extraordinary increases, *global* greenhouse gas emissions must begin to decline from projected levels early in the next century. For *global* emissions to begin to decline in this time frame, developed countries must move quickly to reduce their emissions, setting the stage for future rounds of negotiations.

In the short-term, the difference between the options presented in terms of additional greenhouse gas concentrations in the atmosphere is small. However, institutional and political factors will lead to important differences between these options. Options 3 and 4, for example, are unlikely to lead developing countries to participate meaningfully in the negotiating process. Option 1, on the other hand, may be so stringent that many businesses would simply work to block implementation rather than restructure activities to comply.

For the world realistically to avoid a doubling of pre-industrial greenhouse gas concentrations (to 550 ppm) in the next century, *global* emissions must deflect from a "business-as-usual" path by about 2010. For the world realistically to avoid a near-tripling of greenhouse gas concentrations (750 ppm), *global* emissions must deflect from this "business-as-usual" path by 2020. Even assuming steep reductions in greenhouse gas emissions in distant decades (which our children and grandchildren may or may not be able to achieve), reductions must begin soon to avoid serious environmental damage.

2. Other Environmental Impacts

Any of the options discussed here could have considerable environmental benefits unrelated to climate change. Measures to reduce greenhouse gas emissions would also reduce emissions of SOX, NOX and toxic pollutants such as mercury. Such measures would contribute significantly to meeting potential Clean Air Act standards for particulate matter and ozone. According to EPA estimates, monetizable benefits of reducing fine particles and ozone in connection with Option 1 or Option 2 could total tens of billions of dollars per year by 2010.

APPENDIX C

ECONOMIC ANALYSIS

1. **Introduction.** An Interagency Analytical Team (IAT) has analyzed the economic impact of various emissions constraints, using three different models. The results are broadly consistent with the considerable literature on this subject.

Economic models are by nature imprecise, especially when projecting over several decades. The models' limitations are exacerbated by the complex and far-reaching effects of any policy aimed at reducing greenhouse gas emissions. Some agencies believe it is important to stress that similar modeling in the past with respect to SO₂ controls under the Clean Air Act dramatically overstated costs, due to unforeseen factors. Nevertheless, models can provide insight into the economic costs and benefits of various policy alternatives.

The "base case" modeling results presented here make the following key assumptions:

- Policy options are implemented by 2010, with a ten-year phase-in period.
- Domestic emissions reductions are achieved by an emissions trading system, where certain entities responsible for greenhouse gas emissions must have a permit, a limited number of permits are sold at auction, and permits may then be traded.
- All revenues raised through the auction process go to reduce the Federal budget deficit (or increase the budget surplus).
- There are no transaction costs nor compliance problems with the domestic emissions trading system.
- Monetary policy acts to offset the effects of reduced economic activity through lower interest rates.
- The path of technological progress over the forecast period has energy use per unit of GDP decreasing more rapidly than observed in most historical periods, consistent with increased emphasis on greenhouse gas emissions and energy efficiency.
- The rest of the economy remains unchanged, which will not occur over the long forecast period used. Unexpected shocks to the economy are likely to have very large effects on the estimates presented.

Results are presented for Options 1 through 4, but the figures associated with Options 3 and 4 should be viewed as illustrative only. These figures were not derived from specific IAT modeling of the emissions constraint policies listed as examples for these Options because the IAT has not examined any policies with emissions budgets for 2020 or later. The figures presented are no more than educated guesses, generated by referring to emissions constraints that were modeled. The IAT has the capability to model emissions policies that have targets for 2020 or later and will do so if policymakers think the effort would be helpful.

Three additional caveats should be noted. First, the base case masks disagreements among agencies over likely rates of technological innovation and diffusion. A faster rate of progress in energy-efficiency and carbon-reducing technologies could reduce estimated economic

costs by as much as one-third relative to the base case estimates. However, a slower rate of technological progress than assumed in the base case would increase economic costs noticeably. Second, to the extent that domestic greenhouse gas constraints are not implemented through an emissions trading regime, but instead through less flexible regulatory programs, economic costs will be greater than those shown. Third, to the extent that the distribution of emission permits does not support increased levels of capital investment compared to the baseline, the long-term economic results will be less favorable than estimated by the models.

2. **Results.** As noted above, the United States has strongly supported international trading of greenhouse gases. With trading, countries with high abatement costs (e.g., the United States and Western Europe) could purchase emissions reductions in countries with lower abatement costs (e.g., in the former Soviet Union). Incorporating a well-functioning international market in emissions permits in the modeling reduces estimated energy price increases significantly. With international emissions trading, the United States is estimated to pay about \$5 billion per year to other developed countries (including those in the former Soviet Union) to purchase permits, avoiding greater expenditures in compliance costs.

Results with international trading

Table 1 presents results from the base case with trading of emissions permits among Annex I nations. The trading takes place among all Annex I nations. (In countries where emissions have fallen below 1990 levels, such as in some parts of the former Soviet Union, trading is assumed to be allowed only to the extent there are corresponding emissions reductions from a "no-policy" baseline). All figures are presented relative to a "no-policy" baseline, in 1995 dollars.

The losses in aggregate economic activity are noticeable, but largely transitory. Table 1 shows GDP loss with international trading peaking at a few tenths of a percentage point in 2005-2010 for the case where emissions are stabilized at 1990 levels by 2010. After this initial loss, the economy begins to rebound as the proceeds from permit auctions reduce the Federal budget deficit (or increase the budget surplus), leading to lower interest rates. Businesses respond by making capital investments to offset higher energy costs. After a while, the economy catches up to its original growth path, indicating that the emissions reduction program modeled is implicitly pro-investment and that the economy is robust enough to withstand modest shocks.

Coal bears the brunt of the emissions reduction policies, because coal is the most greenhouse gas intensive fuel. In general, the least costly way to garner significant emissions reductions is to replace coal in electricity generation and industrial uses.

Results without international trading

If an effective regime for trading international emissions permits is not established, then the estimated energy price increases are nearly doubled, with parallel economic losses. This situation is depicted for the base case in Table 2.

The losses in aggregate economic activity are significant, though again, largely transitory. Table 2 shows GDP loss without international trading peaking around 1 percent in 2005, for stabilizing emissions at 1990 levels in 2010. After this initial loss, the economy begins to rebound as revenue from the domestic permit auctions reduces the Federal budget deficit and lowers interest rates. Businesses respond by making additional capital investments, setting off a mini-“investment boom”. By 2015, the economy is estimated (in some models) to regain and even surpass its original growth path. This result indicates that the emissions reduction program as modeled is pro-investment (because reduced personal consumption allows businesses the wherewithal to expand the capital stock).

Technology assumptions

Another possibility for mitigating economic costs is focusing attention and resources on programs that promise to decrease the rate at which the economy produces greenhouse gas emissions. Examples here might include an increased research and development effort or an initiative to more rapidly diffuse the most efficient energy practices through industry. The “hi-tech” set of assumptions added to the base case modeling shows that energy price increases could be reduced by 10-30 percent, by 2010, with larger reductions possible further in the future. Estimated economic costs of the base case policies would be correspondingly reduced.

Environmental benefits

The figures presented here do not reflect the environmental benefits associated with avoiding climate change, nor do they reflect collateral environmental benefits that may result from reduced emissions of greenhouse gases. Policies to reduce greenhouse gas emissions, for example, are likely to reduce emissions of other pollutants, including SOX, NOX, particulate matter and toxic pollutants (e.g., mercury). According to EPA estimates, the monetizable benefits of reducing fine particles and ozone in connection with either Option 1 or Option 2 could total tens of billions of dollars per year.

Economic effects are summarized on the charts below. Note that the figures presented for Options 3 and 4 are not based on actual IAT modeling, since the IAT has not examined any emissions budgets for 2020 or later. The figures for these Options are based on implied increases in carbon prices obtained from other IAT modeling efforts. Thus, the figures presented for Options 3 and 4 should be considered as illustrative only.

Table 1 -- Base Case with OECD Emissions Trading*

Variable of Interest	Option 1 -- 10% below 1990 levels by 2010	Option 2 -- 1990 levels by 2010	Option 3 -- Implied carbon price increase of \$20 per ton **	Option 4 -- Implied carbon price increase of \$10 per ton **
GDP in 2005	-1.0% to -0.1%	-0.5% to 0.0%	-0.2% to 0.0%	-0.1% to 0.0%
GDP in 2010	about -0.3%	-0.4% to -0.1%	-0.2% to -0.1%	about -0.1%
GDP in 2020	-0.3% to +0.2%	about -0.1%	-0.1% to 0.0%	about 0.0%
Implied price increase per ton of carbon in 2010	about \$85	about \$50	about \$20	about \$10
Implied price increase per gallon of gasoline in 2010	about 20-25 cents	about 10-15 cents	about 5 cents	about 2-3 cents
Implied price increase per ton of coal in 2010***	about \$50	about \$30	about \$10-15	about \$6
Implied avg. price increase for residential elect. in 2010****	about 1.5 cents per kwh	about 1 cent per kwh	about 0.5 cents per kwh	about 0.3 cents per kwh
Decline in total employment in 2010 (national)	about 200,000	about 50,000- 250,000	about 50,000- 100,000	less than 50,000
Annual value of domestic emission permits (2010)	about \$110 billion	about \$60-70 billion	about \$25-30 billion	about \$10-15 billion

* Analysis of Joint Implementation (worldwide emissions trading) would show lower costs and imply greater purchases by the U.S. of emissions reductions abroad.

** *Although figures are presented, obtaining agreement under the climate treaty to an international emissions trading regime would be very unlikely with targets in this range.*

*** Current national average approximately \$28/ton

**** Current national average approximately 8 cents/kilowatt hour

Table 2 -- Base Case without OECD Emissions Trading

Variable of Interest	Option 1 -- 10% below 1990 levels by 2010	Option 2 -- 1990 levels by 2010	Option 3 -- Implied carbon price increase of \$35-50 per ton	Option 4 -- Implied carbon price increase of \$15-25 per ton
GDP in 2005	-2.0% to -0.1%	-1.0% to -0.1%	-0.5% to 0.0%	-0.3% to 0.0%
GDP in 2010	-0.7% to -0.3%	-0.6% to -0.2%	-0.4% to -0.1%	-0.2% to -0.1%
GDP in 2020	-0.3% to +1.0%	-0.6% to +0.2%	about -0.1%	about 0.0%
Implied price increase per ton of carbon in 2010	\$130-200	\$80-140	\$35-50	\$15-25
Implied price increase per gallon of gasoline in 2010	35-50 cents	20-40 cents	10-15 cents	5-10 cents
Implied price increase per ton of coal in 2010*	\$80-120	\$50-85	\$20-30	about \$10-15
Implied average price increase for residential electricity in 2010**	about 4 cents per kwh	about 1.5-3.0 cents per kwh	about 1 cent per kwh	about 0.5 cents per kwh
Decline in total employment in 2010 (national)	about 200,000- 500,000	about 150,000- 400,000	about 50,000- 250,000	about 50,000 - 100,000
Annual value of domestic emission permits (2010)	about \$270 billion	about \$110- 190 billion	about \$50-70 billion	about \$20-35 billion

* Current national average approximately \$28/ton

**Current national average approximately 8 cents/kilowatt hour.

APPENDIX D ADDITIONAL BACKGROUND

A. Basis for Concern

The build-up of greenhouse gases in the atmosphere threatens fundamentally to alter the Earth's climate. The most recent international scientific assessment concluded that global average temperatures will increase by 2-6.5 degrees F. by 2100, unless actions are taken to slow the build-up of greenhouse gases. This is the fastest increase in more than 10,000 years.

Potential impacts from climate change include sea level rise, the spread of infectious disease, extreme weather events (such as droughts and floods), loss of forest cover and shifts in agriculturally-productive regions. Absent policy interventions, global average temperatures by the end of the next century will increase 2-6.5 degrees F., sea-level rise will inundate more than 9000 square miles in the United States (with Florida and Louisiana most vulnerable), and an additional 50-80 million people will contract malaria worldwide. According to a NOAA study, average July temperatures in Washington, D.C. by the end of the next century are expected to increase by 5-15 degrees F. (with greater humidity). The international scientific assessment states that "climate change is likely to have wide-ranging and mostly adverse impacts on human health, with significant loss of life."

Nevertheless, significant uncertainties remain concerning the magnitude, timing and regional distribution of impacts. Currently, scientists are unable to predict changes in short-term weather patterns in particular regions.

Atmospheric concentrations of carbon dioxide (the most important greenhouse gas) are well above historic levels and climbing sharply. Concentrations are currently 360 parts per million (ppm), about 30% above pre-industrial levels and the highest in at least 200,000 years. Absent policy interventions, concentrations in 2100 are predicted to reach roughly 750 ppm, the highest in more than 50 million years.

B. Human Sources of Greenhouse Gases

The principal cause of the buildup in greenhouse gases is the burning of fossil fuels. Other human activities, including deforestation and mining, also play a role. The international scientific assessment concluded that "the balance of evidence suggests there is a discernible human influence on the global climate."

Developed countries are responsible for more than 75% of the increase in greenhouse gas concentrations since the beginning of the Industrial Revolution. In the decades ahead, however, emissions from developing countries are expected to grow sharply. By 2035, developing country emissions are expected to exceed those from the developed world.

The United States emits more greenhouse gases than any nation in the world (roughly 25% of the world's total). Our per capita emissions are among the world's highest -- roughly

50% greater than the OECD average and eight times that of China. In the United States, greenhouse gas emissions come mainly from industry (1/3), transport (1/3) and buildings (1/3). Since 1990, U.S. greenhouse gas emissions have grown 7-8%. Without policy interventions, U.S. emissions are projected to grow 20-25% over 1990 levels by 2010.

None of the actions contemplated during this round of negotiations will, by themselves, reverse the build-up of greenhouse gases in the atmosphere or even slow it significantly. However, this round will set the stage for future negotiations over steps by both developed and developing countries, and will send important signals to the private sector that could affect the rate at which beneficial technologies are developed and adopted.

C. Clinton Administration Policies To Date

The Clinton administration has been active on this issue since Earth Day 1993, at which time you pledged to return U.S. greenhouse gas emissions to 1990 levels by the year 2000, and then to continue the trend of reduced emissions. In October 1993, the Administration issued the Climate Change Action Plan, designed to achieve that goal. Due to Congressional budget cuts, higher-than-expected economic growth and lower-than-expected energy prices, however, this goal will not be achieved.

You have spoken to this issue on many occasions. In May 1997, in Costa Rica, you said "we must meet the challenge of climate change"; in April 1997, before departing for North Dakota, you discussed possible links between extreme weather events and greenhouse gas emissions; in your 1997 State of the Union, you called for "reduc[ing] the greenhouse gases that challenge our health even as they change our climate"; in December 1996, in Australia, you said "we must work to reduce harmful greenhouse gas emissions...If they continue unabated, the consequences will be nothing short of devastating the children here in this audience and their children."

The Administration has strongly supported research and development programs with significant climate change benefits. Examples include the Partnership for a New Generation of Vehicles (a \$280 million program), the Global Change Research Program (\$1.8 billion) and renewable energy and energy efficiency programs (\$1 billion).

The United States has been an active participant in the international climate change negotiations, as described below.

D. International Negotiating Context

There is international agreement that the climate change problem is significant and requires action. There is also consensus that the existing UN Framework Convention on Climate Change, signed in Rio in 1992, is inadequate. Under the Convention, developed countries set a goal of reducing greenhouse gas emissions to 1990 levels by the year 2000, but few will do so. The Convention contains no goal beyond the year 2000.

In April 1995, in Berlin, the Parties to the Convention agreed to negotiate next steps for the post-2000 period. Under the terms of the "Berlin Mandate," developed nations would agree to quantified emissions limits over specified time frames (e.g., 2005, 2010 and 2020) by December 1997. Developing nations (who typically have less stringent obligations than developed nations in environmental treaties) agreed to reaffirm their existing commitments, and continue to advance implementation of these commitments in this round of negotiations.

In July 1996, the U.S. called for an approach that would include three key elements: (1) a binding target (instead of the existing Convention's non-binding goal), (2) flexibility in implementation (for example, through emissions trading among developed nations and "joint implementation" with developing nations), and (3) the participation of developing countries. The U.S. proposal did not include any particular target or timetable.

Support for most aspects of the U.S. proposal has been quite limited. Some aspects have encountered stiff opposition. Few countries have supported the US call for more active developing country participation under the Convention. Developing countries, in particular, have argued heatedly that the developed world is responsible for the buildup of greenhouse gases in the atmosphere and must take the lead in addressing the problem. Support for "joint implementation" has also been limited. Such a mechanism could significantly reduce overall costs to the U.S., but involve substantial international payments or transfer of technology by the private sector.

Views of other countries vary considerably. The European Union has proposed that developed nations cut back emissions 10-15% from 1990 levels by 2010 (and an as-yet unspecified amount by 2005). Small island nations have proposed that developed nations reduce emissions by 20% from 1990 levels by 2005. Other nations, including Australia, Japan and Canada, have expressed concerns about moving too far too fast, but have not put forward any specific targets.

E. Constituency Views.

At present, public attention to climate change is low. Although polling data indicate that the public believes climate change is a serious problem, few rank it high on a list of concerns. Public and media attention to the issue will likely grow as the Kyoto Conference approaches.

For many environmental groups, strong action on climate change is a litmus test for the administration's environmental policy. They plan public relations campaigns on the issue in the

year ahead. Many environmental groups are calling for sharp emissions cuts early in the next century (e.g., 20% below 1990 levels by 2005). On the issue of emissions trading and joint implementation, the environmental community is divided, with some groups (e.g., Environmental Defense Fund) strongly supportive and others (e.g., Sierra Club) strongly opposed. Most environmental groups will support flexibility provisions if coupled with emissions reductions below 1990 levels.

Business is composed of several camps. The largest -- made up of coal companies, coal-dependent utilities, fuel producers, heavy industry and transporters -- is strongly opposed to any action at Kyoto. This group is well-funded and poised for a significant public relations campaign. A second group -- made up of chemical companies, natural gas interests, some appliance manufacturers and others -- is cautiously supportive of action at Kyoto. A smaller third group -- composed of natural gas, renewable energy and energy efficiency companies -- strongly supports aggressive climate change policies. Many businesses point to international competitiveness as a primary concern. In a major speech recently, the CEO of BP broke ranks with other oil companies and said "it would be unwise and potentially dangerous" to ignore mounting evidence of climate change.

Earlier this year, more than 2000 economists (including six Nobel Laureates) signed a letter stating that "sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer-run." Recently, several dozen scientists sent the President a letter warning of the consequences of rapid climate change and urging us to limit change to the "lowest rate feasible."

Agriculture groups are only beginning to pay attention to this issue. They have been concerned about extreme weather, but also worried that climate change mitigation policies could lead to rising fuel costs and competitive disadvantage with developing countries. The U.S. insurance industry is also beginning to pay attention, especially the reinsurers (who have lobbied Congress for more money for climate change research).

Labor is increasingly opposed to action on climate change, largely in deference to the concerns of the United Mine Workers. An AFL-CIO resolution earlier this year was critical of the administration's climate change policy. Some unions -- including the UAW, the Steelworkers, the Oil, Chemical and Atomic Workers, the AFT and the NEA -- have taken more moderate views in the past.

Finally, the religious community is increasingly engaged on this issue. The National Council of Churches has collected more than 100,000 signatures in the past few months on a petition urging action on this issue.

F. Congressional Considerations

There is considerable skepticism about climate change on Capitol Hill. Most Republicans, and many Democrats, appear far more concerned about the costs of mitigation than the problem itself.

Southern and western Republicans are, by and large, skeptical or hostile to action on climate change. Midwestern Democrats have expressed concern about the impacts of climate change policies on coal and heavy manufacturing (especially autos). Northeast and West Coast Members are perhaps the most likely to support action on this issue.

Many Members cite the unwillingness of developing countries to accept quantitative emissions limits as a major concern. Increasingly, Members are complaining about a lack of openness in our decision-making process. Many are urging the administration to make key aspects of our policy and analysis known in the very near future.

"Advice and consent" of the Senate will be required for any agreement reached in Kyoto. Implementing legislation will likely be needed as well. Favorable votes in the 105th Congress, or even the 106th, would be an enormous challenge. Ratification might need to await work on matters (e.g., joint implementation, developing country commitments) unlikely to be resolved in Kyoto.

G. Domestic Implementation

An Assistant Secretary-level working group has recommended a domestic climate change policy with three parts: domestic emissions trading programs, technology programs, and transition assistance programs. Details of these programs could be developed in consultation with constituencies in the months ahead.

i. Emissions Trading Programs Under domestic emissions trading programs, permits representing rights to emit greenhouse gases in the United States would be distributed, either through an auction or allocation system. Permits would be tradeable. Firms would have an incentive to control emissions where costs are low and sell reductions to firms facing higher control costs.

Domestic emissions trading programs are an attractive policy tool. Compared to traditional "command-and-control" regulatory approaches, they offer greater flexibility and lower costs. Such programs are being used successfully in several areas under the U.S. Clean Air Act.

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

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

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

ii. Technology Programs. The cost of reducing greenhouse gas emissions between now and 2020 depends greatly on the ability to accelerate use of existing energy-efficient technologies. Over the longer-term, the solution to the climate change problem depends on developing and deploying new technologies that are even more efficient and/or based on non-carbon energy sources.

A range of government programs might help accelerate technological change. Information dissemination programs assist businesses and consumers in identifying opportunities to reduce the energy intensity of their products or services (e.g., using more energy efficient light bulbs, insulation, appliances, etc.). In addition, research and development programs generally aim to improve technologies by lowering production and operating costs. Large opportunities for cost-lowering research and development exist in buildings, transportation, combustion, renewables and sequestration (e.g., fuel cells, advanced industrial turbines, advanced diesel engines, and transportation biofuels). However, generating significant increases in budget support for technology programs will be challenging.

iii. Transition Assistance Programs. Under any of the policy options being considered, some workers and communities may be adversely affected. Workers in energy-intensive industries and those in energy extraction may be most likely to be hurt. Given the geographic isolation of some of these industries, the surrounding communities may also be adversely affected.

A transition program would reduce costs to individuals and communities. Transition assistance can help facilitate community and worker adjustments via retraining, job search assistance, and infrastructure development for new business in the community. As previous experience with acid rain, military base closures, and the federal government's own work force restructuring has demonstrated, the early development of such programs can be vital to building public support for a policy.

Among the important issues to address in designing a transition program are:

---Whether a new, categorical program should be designed or existing programs expanded. A new, categorical program would limit benefits to targeted workers and communities but allow for flexibility in benefit levels. Expansion of current programs to allow for increased usage is consistent with Administration program consolidation efforts but constrains program design flexibility.

---How the program will interact with the other components of climate change policy. Permit auctions could provide an important revenue source for these programs. Permit allocations could be used to "fund" transition assistance.

6/10/97

for example
CEA shares Treasury and OMB's concerns, and believes that Option 2 reduces remissions more rapidly, and hence would be more costly, than the path that optimally balances economic costs and environmental benefits. Nevertheless, CEA believes that solving the global climate change requires participation of both developed and developing countries. For this reason, CEA is willing to accept a more ambitious path if it is absolutely necessary to secure (a) LDC commitment to "evolution," that is, eventual accession to emission limits similar to the Annex I countries; and (b) a flexible international trading system.

ISSUE FOR DECISION

In your trips to the Denver Summit of the Eight (June 20-22) and UN General Assembly Special Session on Environment and Development (June 26), what should you say concerning the U.S. position on emissions levels under the climate treaty?

NEED FOR DECISION

To date, the U.S. has not supported any specific emissions levels under the climate treaty. Other countries and domestic constituencies are calling on us to state our views. At the Denver Summit of the Eight, Chancellor Kohl and others will press you on this issue. At the UNGA Special Session, media and constituency interest in this issue will be high. Both meetings offer important opportunities to advance and explain our position.

I. BACKGROUND

Climate change is an issue of vast scale. **The policies you propose here could have larger effects on our environment, our economy and way of life than anything else in your Administration.** ~~Decisions on the issue posed in this memorandum could have significant environmental, economic and political consequences.~~

The Science

The build-up of greenhouse gases in the atmosphere threatens fundamentally to alter the Earth's climate. Currently, greenhouse gas concentrations are at their highest level in more than 200,000 years. (See Appendix A). Absent policy interventions, concentrations by the end of the next century will reach the highest level in more than 50 million years. Impacts are predicted to include sea level rise, the spread of infectious disease, more frequent and severe droughts and floods, loss of forest cover and shifts in agriculturally-productive regions. Absent policy interventions, global average temperatures by the end of the next century are projected to increase 2-6.5 degrees F., sea-level rise is projected to inundate more than 9000 square miles in the United States (with Florida and Louisiana most vulnerable) and an additional 50-80 million people are projected to contract malaria worldwide. According to a NOAA study, average July temperatures in Washington, D.C. by the end of the next century are expected to increase by 5-15 degrees F. (with greater humidity).

Even the most ambitious policies described below will have only a small effect on the actual concentrations of CO₂, which will continue to rise in any case. Ultimately, far larger reductions will be needed -- by all nations, both developed and developing -- even to slow the rate of growth. However, US policies can be the basis for agreements by other nations.

Economic Costs

The economic costs of reducing greenhouse gas emissions are also large and potentially substantial. The principal source of such emissions is the burning of fossil fuels, which powers the global economy. In order to reduce emissions to the 1990 levels recommended by most of your cabinet would require a new emissions control program on domestic utilities, industry and transportation. Your advisers would recommend doing so by auctioning emissions rights, to minimize the economic dislocations, and by negotiating international agreements that allow international trading of these rights. This approach would raise tens of billions of dollars annually in revenues, which could offset the deficit and encourage economic growth. Even so, our economic modeling to date suggests that stabilizing emissions at 1990 levels by 2010 (ten years later than envisioned in the Climate Change Action Plan) would in 2010 ~~is projected to reduce U.S. GDP by 0.1-0.4%~~ (with somewhat larger reductions in consumption), increase gasoline prices in 2010 by 10-15 cents per gallon and more than double the price of coal. These modeling results are necessarily approximate. Your economic advisers would note that they depend on relatively modest baseline economic growth and uncertain assumptions about the rate of technological change, and that the actual effects might be larger. Furthermore, these effects are national averages: the dislocations would be felt predominately in coal producing and consuming parts of the Eastern US, offset by growth elsewhere.

These projections assume ~~Without a well-functioning system of international emissions trading, which would permit purchase by US users of emissions rights from Russia.~~ Without such trading, the effects of stabilization by 2010 ~~se figures~~ would be even higher -- a U.S. GDP loss of 0.2-0.6% (with slightly larger reductions in consumption), gasoline price increase in 2010 of 20-40 cents per gallon and roughly a tripling of the price of coal. Reaching international agreement on an effective system of trading will be critical, but also complex and difficult. Furthermore, private capital outflows associated with an international emissions trading regime would themselves be substantial -- one preliminary estimate is ~~are predicted to be roughly \$5 billion per year.~~

~~These economic estimates assume that revenues raised by auctioning emissions permits are used for deficit reduction -- costs could be higher if implementation programs are less favorable to investment or lower if programs are more favorable to investment. Significantly, modeling indicates that economic losses from some policies are largely transitory: after an initial loss, the economy rebounds and catches up to its original growth path. Costs depend significantly on rates of technological innovation. Effects on some sectors and regions of the economy will be much larger than effects on the economy as a whole.~~

International Negotiations

This administration has been active on this issue since Earth Day 1993, at which time you pledged to return U.S. greenhouse gas emissions to 1990 levels by the year 2000, and then to continue the trend of reduced emissions. In October 1993, we issued the Climate Change Action

Plan, made up of several dozen mostly voluntary programs, designed to meet that goal. (Due to Congressional budget cuts, higher-than-expected economic growth and lower-than-expected oil prices, the goal will be missed by a wide margin). U.S. negotiators have shaped the international climate change negotiations by calling for binding emissions targets, "flexibility" provisions (such as international emissions trading and joint implementation) that would significantly lower costs of meeting those targets, and the participation of developing countries. You have spoken to this issue several times in the past year, including in the 1997 State of the Union, where you called for "reduc[ing] the greenhouse gases that challenge our health even as they change our climate," but the US has as yet made no statements about specific emissions targets or timing.

The views of other countries vary considerably. The European Union has proposed that developed nations cut back 10-15% from 1990 levels by 2010 (and by an as-yet unspecified amount by 2005). Small island nations have proposed both earlier and larger cuts. Other nations, including Australia, Japan and Canada, have expressed concerns about moving too far, too fast, but have not made specific proposals.

Political Issues

The politics of this issue are difficult, at best. Any agreement at Kyoto will ultimately require both ratification by the Senate and passage of implementing legislation by both houses of Congress.

For many environmental groups, strong action on climate change is a litmus test for your environmental policy. If you fail to speak decisively on this issue in Denver (at the Summit) or New York (at the UNGA Special Session), their criticism will be intense.

On the other hand, there appears as yet to be only limited public support for the kinds of measures necessary to reduce greenhouse gas emissions domestically. Much of the business community is strongly opposed to action on climate change. Fossil fuel and heavy manufacturing companies are poised vigorously to attack any policies the environmental community might support. They will characterize any emissions control or trading scheme as a new tax — at \$50 to \$100 billion per year the largest ever enacted. Labor is increasingly opposed to action as well, largely in deference to the concerns of the United Mine Workers. Southern and western Republicans on the Hill are very skeptical about this agenda, as are midwestern and coal state Democrats.

— II. OPTIONS

Earlier this week, we identified several options for principals concerning the U.S. position on emissions levels in the international climate change negotiations. Each option was defined in terms of a broad directional statement you might offer at the Denver Summit or

*will use proposed revenues of
and potentially even use them
to the point of \$100 billion
program*

of 25% tax increase

UNGA Special Session. Nonetheless, each is also described by a particular combination of emissions targets and timing, to help clarify the consequences of the position you take.

The meeting produced a considerable convergence of views. Most agencies (State, Commerce, Transportation, Energy, Agriculture, EPA, AID, OSTP and CEA) supported an option in which you would call for “stabilizing emissions in the medium term and reducing thereafter.” In the parlance of the climate change negotiations, “stabilizing” means returning greenhouse gas emissions to 1990 levels and “medium term” means 2005-2020.

Several caveats are important:

First, many of these agencies conditioned their support on success in obtaining flexibility provisions (e.g., international emissions trading, joint implementation) and the participation of developing countries. These agencies generally believe that any statement you make concerning emissions levels should be coupled with a strong statement on the importance of these additional provisions. Some agencies believe we should not accept any agreement at Kyoto unless developing countries agree to eventual accession to emissions limits similar to developed countries.

Second, the Treasury Department and OMB have significant concerns about the economic costs and domestic political feasibility of achieving stabilization by in the 2010, the timeframe endorsed by most of your advisors. The Department of State and other agencies, however, believe that a commitment to stabilization by any later date would damage US credibility internationally and impair our ability to influence an international agreement. ~~These agencies note that opponents would characterize domestic emissions trading regime as a tax, with revenues larger than any tax increase yet considered by your administration. Treasury also focused on the potential wealth transfers possible under some control regimes, noting that these transfers could be several times the size of the tax cuts contemplated in the balanced budget agreement. Treasury note that cost estimates are based on the assumption that underlying economic growth rates through 2010 will average just over 2%, and that costs of achieving any target would increase if these growth rates were higher.~~

Third, many participants noted the magnitude of this decision for the second term agenda. There is a widely held view that we cannot take this on without you and the Vice President making this a top tier issue during the next several years. Some agencies think this could be the most significant issue you address in the second term.

Fourth, at least one agency (Energy) linked its support to strong administration backing for increased funding for greenhouse gas-related technology programs in the years ahead. OSTP argued that, with appropriate investments, we can meet both our climate change and economic goals with advanced technologies (such as the 80 mpg “supercar” being developed by the Partnership for a New Generation of Vehicles). Energy, EPA and

OSTP argue strongly that these technologies were not adequately considered in the economic modeling showing GDP and job losses. In contrast, the economic agencies argue that technology assumptions in the modeling are overly optimistic.

Finally, one agency (CEA) stated that if no agreement is reached Kyoto, the U.S. should consider taking relatively small unilateral actions to show good faith internationally, to start educating the American people and to begin creating the incentives for energy efficient investments.

In light of the foregoing, and after further discussions, we are identifying five options for you in Denver and New York. They are:

Option 1: Call for "significantly reducing emissions in the medium term."

*Comment*¹ - Interior Department supports this option, stating that strong measures are necessary to protect the resources it manages. Such a statement would be interpreted to be consistent with the E.U. proposal (a 10-15% cut from 1990 emissions levels by 2010).

Pros:

Environmental benefits could be large. EPA estimates non-climate benefits (such as reducing fine particles and ozone) would be tens of billions of dollars. Many environmental groups would be pleased.

Cons:

Could impose very large costs on the U.S. economy.
Business and labor would be very strongly opposed.
Without significant changes in the political landscape, the prospects for ratification by the Senate in the next several years would be close to zero.

Option 2: Call for "stabilizing emissions in the medium term and reducing thereafter."

~~Emphasize that~~ flexibility and the participation of all nations (including developing countries) ^{which} are essential to addressing this problem.

Comment - This is the recommendation from most of the Cabinet. In making this recommendations, the Cabinet focused on a specific emissions target: stabilizing emissions at 1990 levels. Most supported doing so by 2010 (although some agencies could support a timeframe stretching later, to 2015 or 2020).

Pros:

→ Condition support for these emission levels on

¹ The "comment" label is unnecessary.

Allows you to take the high ground: committing the U.S. to meaningful emissions reductions, while insisting on other principles we consider vital to an agreement. Provides considerable flexibility for future development of our position: consistent with stabilizing emissions at 1990 levels anywhere between 2005 and 2020.

Environmental benefits (both climate and non-climate) could be significant. Some environmental groups would be pleased; others would complain of lack of U.S. leadership.

Cons:

Overall economic impacts of this option ~~would be significant. Although the effects might ultimately be offset by investment of the revenues, GDP in 2010 could be reduced by 0.6% percent (\$60 billion) and consumption by 1%.~~ ~~(although GDP impacts could be transitory).~~

The price of gasoline would rise by as much as 40 cents per gallon. The price of coal could rise from under \$30 to over \$100 a ton, and the price of electricity in the Northeast could increase by __.

Dislocation in some sectors and regions (especially coal states and the Northeast) would be large and long-lasting.

Most business and labor groups would be opposed, ~~although some might support if the policy were coupled with other features they find attractive².~~

Without significant changes in the political landscape, the prospects in the next several years for ratification by the Senate and passage of implementing legislation in both houses would be poor.

Option 3: Call for “beginning to reduce emissions ~~growth~~ by 2005 and stabilizing emissions by ~~toward~~ (the end of) the medium term, with a commitment to further reductions thereafter.”

Comment: This option envisions an international regime that mandates starting emissions reductions earlier than Option 2, but reducing emissions to 1990 levels over a longer period of time. While less constraining than Option 2, the rhetoric used to describe this option (other than the 2005 component) could be substantially identical to the rhetoric for Option 2.

Pros:

² What evidence is there for this?

Calling for concrete action before 2010 could be portrayed as more activist and providing greater credibility for our efforts to obtain agreement on trading and developing nations.

Delayed the most stringent reductions would ~~target date~~ reduces economic costs substantially, by allowing capital stock to turn over at a natural rate and technology to improve.

~~Calling for early target date could be portrayed as an activist approach.~~
~~more?~~

Cons:

Would be criticized by environmental community as showing lack of leadership by delaying stabilization for more than two decades.

Would be criticized by moderate business groups (e.g. chemical companies, some utilities) who strongly oppose any target before the year 2010.

Would be criticized by more hard-line business groups (fossil fuel producers, heavy manufacturing) and many in organized labor who oppose any action on climate change.

May jeopardizes our ability to achieve flexibility provisions (e.g., international emissions trading, joint implementation) and developing country participation in international negotiations.

Without significant changes in the political landscape, the prospects for ratification by the Senate in the next several years would be poor.

Option 4: Call for “reducing emissions *growth* in the medium term, on the way to stabilization and eventual reduction of emissions.”

~~Comment:~~ For example, emissions would peak in 2010, return to 1990 levels in the longer term (i.e. after 2020) and decline thereafter.

Pros:

Economic costs would be relatively mild. Some economists would view this emissions path as consistent with one that would balance costs and benefits of climate change policy.

Opposition in the business and labor communities would be mild.

There is a chance an option along these lines would be ratified by the U.S. Senate in the next several years without major political changes.

Cons

With this option, there is no chance of obtaining international agreement on our “flexibility” or “developing country participation” proposals.

Criticism from other countries and U.S. environmental groups would be very strong. Environmental groups would equate your performance in New York with George Bush's performance at the 1992 Rio Earth Summit. Environmental benefits (both climate and non-climate) would be modest. Some economists (especially those who emphasize the environmental benefits of climate change policies) would criticize this option as inadequate.

Option 5: Call for "strong action on climate change" and "agreement in Kyoto." Say that the United States is continuing to study the issue of emissions levels and will elaborate on its position at a later time.

Comment: This roughly repeats prior statements by you and other administration officials.

Pros:

- Leaves options open for future decisions.
- Allows additional refinement of economic modeling runs before our position is announced.

Cons:

- Would be strongly criticized by environmental groups, who would equate your performance in New York with George Bush's performance at the 1992 Rio Earth Summit.
- Without more definition of our position on emissions levels soon, our ability to achieve agreement to flexibility and developing country provisions in Kyoto will be seriously impaired.

Material analyzing the environmental impacts of these options is attached as Appendix B. Material summarizing the projected economic impacts of Options 1 and 2 are presented in Appendix C. The interagency analysis team has not examined options that stabilize emissions at 1990 levels in 2020 or beyond (e.g. Options 3 and 4). Additional background material on climate change (including a discussion of domestic policy options) is attached as Appendix D.

THE WHITE HOUSE
WASHINGTON

*Cym t
g Shogren*

July 8, 1997

MEMORANDUM FOR DISTRIBUTION

FROM: MARK MAZUR
DAVID SANDALOW

SUBJECT: Climate Change

There will be a meeting Thursday, July 10 from 9:30-11 in OEOb Rm. 472. The agenda will be:

1. Economic analysis
2. Policy development process
3. Coordination with other initiatives/issues
4. Science

Attendance is invitees only. Everyone on the attached list has been cleared into the building. For questions concerning clearance, please call Adam Cox (456-5145).

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DOL	Ed Montgomery	219-4902	219-5108
DOD	Sherri Goodman	703-693-7011	703-695-6639



Executive Office of the President
Council on Environmental Quality

Date:

JUN 26 1997

To: Janet Yellen 314
From: Katie McGinty

JLY
AHM
JAF

-
- ☐ Prepare reply for my signature.
 - ☐ Please handle.
 - ☐ Discuss with me.
 - ☐ Reply directly; please send me a copy.
 - ☐ For your comments.
 - ☒ For your information.

MJ
SR
JS

Remarks:

Sec. Daley's speech on
climate.



UNITED STATES DEPARTMENT OF **COMMERCE** **NEWS**

WASHINGTON, D.C. 20230

OFFICE
OF THE
SECRETARY

FOR IMMEDIATE RELEASE

Friday, June 20, 1997

CONTACT: Maria Cardona
202-482-4883

Remarks by U.S. Secretary of Commerce William M. Daley
Greenhouse Gas Emissions Trading Policy Forum

(As Prepared for Delivery)

Good afternoon. I am delighted to join you. It's a special pleasure to be here at the Union League Club. I have hanging over the fireplace in my office in Washington a portrait of Theodore Roosevelt -- the president who signed the bill creating the Commerce Department -- which the Club was kind enough to lend me.

Let me begin today by congratulating the United Nations Conference on Trade and Development and the Earth Council for launching this important environmental initiative. The move towards an international greenhouse gas emissions market, similar to the successful U.S. program for cost-effectively lowering acid rain, is both timely and appropriate. I also want to recognize Chicago executive, Dr. Richard Sandor, and the government of Costa Rica for their trail-blazing efforts in this regard.

The Clinton Administration is deeply committed to, in the President's words, giving our children a world worth living in. Last week in a meeting with U.S. business CEOs, President Clinton challenged the group to prove that an economy can grow, while not only preserving, but actually enhancing the environment. No one has been more out front on this issue than Vice President Gore, who is actively working with both government and industry to help our nation meet its economic and environment goals.

The President and Vice President -- all the members of this Administration -- strongly believe that environmental commitments can complement economic objectives. Through far-reaching dialogues, healthy debate, and public-private partnerships, we can find responsible, cost-effective ways to foster family and community friendly growth.

The Administration's Clean Car Initiative, officially known as the Partnership for a New Generation of Vehicles, is a prime example of this approach. Working together, seven federal agencies, the "Big Three" auto makers, 20 national laboratories, and over 300 auto suppliers and universities are developing vehicles with three times the energy efficiency of today's automobiles - with no sacrifice in cost, comfort or safety. I have met with the executives involved. The progress is real. Even those who were skeptical originally are now excited.

Public-private partnerships can work. And if ever an issue called out for a cooperative approach, it is climate change. This isn't about dotting the i's in a regulatory finding or making minute calculations that will affect a small handful of people. This is not a single industry problem. It is not single city problem. It is not a single country problem. It is a human problem that, unlike other environmental issues, affects every person, every business and every government in this world.

To solve it, to promote the best interests of our businesses and workers and generations to come, we need cooperation, not confrontation. This battle will be won by industry and government reasoning and working together.

So let me be clear at the start what my message is. We believe that the long-term threat of global climate change is real. We believe that we must take action now. We also believe that we can shape an agenda that allows us to preserve our environment and grow the economy. As Teddy Roosevelt said, "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value."

We can do this by working creatively and responsibly at home and with other nations to develop a climate change policy. The key questions that confront us at this moment are how and when to begin. Let me answer that second question first. Again I say, we must begin now. Not because of the danger of an imminent disaster. But studies do show that emissions are growing. If we are to avert a greater problem later, we need to act now.

What do we know about climate change? We know that carbon dioxide warms the planet and that by pumping more of it into the atmosphere, we are changing our climate. We know that we've had more extreme weather conditions in the United States in the last five years than we had in the previous 30. We know that rising emissions of greenhouse gases trap heat within the earth's atmosphere. We know that global average surface temperature has increased, and the last few years have been the warmest of the past century. We know that, despite the naysayers, the science is compelling: there is a discernible human influence on global climate. We know that while we cannot precisely predict what or where the effects of the climate changes taking place will be, the net effect is unlikely to be good -- and the shift in temperature may be abrupt and occur in ways that we may not predict. And, finally, we know deep in our hearts that we do not want to gamble with our children's future.

I have talked to the experts. From Commerce Department scientists who are among the world's leading researchers into the atmospheric phenomenon and effects surrounding climate change and its likely impacts -- and from the Intergovernmental Panel on Climate Change, comprised of the world's preeminent scientists -- the best scientific evidence indicates that global warming is occurring. And that it could have profound consequences for the economy and the quality of life for us -- and for future generations. The time to address this threat is now.

I have reviewed with the Commerce Department economists who managed an interagency climate change analysis their recommendations on responses to the impact of climate change.

Chief among these is a far-sighted technology program that targets emission control and reduction. We need to sit down with concerned industry leaders and find ways to accelerate the development and diffusion of innovations that achieve these goals. We need to start thinking big and "out of the box." The benefits would be multiple. Reduced emissions and a healthier environment foremost. And beyond this, well-designed processes reduce total business costs and drive economic growth.

By some estimates, up to half of U.S. economic growth since World War II has been fueled by advanced technologies. New energy and energy efficiency technologies, as well as wholesale new ways to make and use products and services, will create new markets and new opportunities for U.S. companies and businesses worldwide.

Also noteworthy is the recent study which shows that establishments that use advanced technologies are more productive, pay higher wages, offer more secure jobs and increase employment more rapidly than firms that do not.

The interagency analysis indicates that capital incentives are important to managing climate change. Investment triggers capital stock turnover and technology advances, the key to emission reduction. Technological innovation is the principal means for moving beyond the outdated tradeoff between jobs and the environment. Therefore, investment incentives must be considered as part of climate change strategy. We believe that pro-investment policy is pro-environment, pro-growth policy.

At the same time, we realize that though the economic costs of dealing with greenhouse gases are transitional and relatively small -- the equivalent of a 25 cent increase in the price of gasoline by some estimates -- these should include compensation for those workers adversely impacted.

The United States is committed to constructing a climate change strategy that is both responsible and reasonable -- a strategy that recognizes the near-term concerns of American workers and businesses -- and the long-term benefits to all of America and all of the world that a healthy environment brings. I will be working closely with the American business community to develop a plan that achieves our twin goals of promoting economic growth and preserving the environment.

I have one final and very important point. As this forum pointedly demonstrates, solving the climate change problem cannot be a sole source endeavor. The whole world must be involved. All nations -- developed and developing -- must participate. We cannot and will not agree to a international system that imposes constraints on developed countries, but leaves developing countries without obligations. We won't agree to such a system because it wouldn't work. It wouldn't solve the global challenge of reducing greenhouse gas emissions. And it would unfairly hurt U.S. business. This will be a key element of the U.S. proposal for any worldwide effort.

As British Petroleum CEO John Browne told a university group last month in a speech on climate change, "The cultures of politics, science and enterprise must work together if we are to match and master the challenges we all face. Our future is a common one. So too needs to be our resolve."

I want to again congratulate you for promoting this forum and putting together this important initiative. I look forward to working with all of you toward a healthy global environment.

Thank you.

**OFFICE OF TIMOTHY E. WIRTH
UNDER SECRETARY
FOR GLOBAL AFFAIRS**

DEPARTMENT OF STATE

2201 C Street, N.W.

Room 7250

Washington, D.C. 20520

Phone: 202-647-6240 Fax: 202-647-0753

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Please deliver to: Interagency Climate Change Deputies Group
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Dirk Forrister, CEQ
Jeffrey Frankel, CEA
John Garamendi, Interior
Jack Gibbons, White House
T.J. Glauthier, OMB
Sherri Goodman, Defense
Fred Hansen, EPA

Number of Pages (including cover): 8

Date: June 25, 1997

**Please see the following memo and attachments regarding my recent
conversation with Senator Byrd.**

TEW

**United States Department of State*****Under Secretary of State
for Global Affairs******Washington, D.C. 20520-7250*****MEMORANDUM****To: Climate Luncheon Group****From: Timothy E. Wirth****Subject: Conversation with Senator Byrd**

On June 18 I met with Senator Robert C. Byrd, discussing climate and his resolution. Attached are quotes from my notes of this remarkable discussion.

In sum:

- Senator Byrd can be a powerful ally.
- I conclude that we must strengthen our language concerning the developing world, perhaps with some sort of trigger mechanism (when developed world meets their targets, the obligations of the developing world kick in).

On June 19, the Senate Foreign Relations Committee held a hearing on the Byrd resolution. Attached also find a copy of the Byrd resolution which now has 61 co-sponsors, a good report on the hearing, and a Washington Times article on the resolution.

Conversation with Senator Robert C. Byrd (documented by Timothy E. Wirth)
June 18, 1997

Doesn't do any good to plug holes in the bottom of the boat while others are punching holes — we'll all go down.

We won't drive [the developing world] away from the table — they are not even at the table.

This is an opportunity to share and benefit from our technology.

They have the begin at some point — some agreement needed now that binds them.

There will be no treaty through the Senate until we change it.

We pull heavier oar at the beginning — then we are all in this together.

We have to do something and it's going to hurt; it's coming — these are industries, including some in my state, that are going to suffer some.

I've been here for 80 years and I've seen change. Something is happening.

I don't doubt the science; I believe it.

June 20, 1997

p. A 6

The Washington Times

NATION

Senate opposes 2-track approach

Pollution cuts eased for China

ASSOCIATED PRESS

The Senate will likely reject a climate treaty that fails to require developing countries such as China — as well as industrial nations — to cut pollution linked to global warming, Democratic and Republican senators warned yesterday.

The Clinton administration said it would support efforts at an international climate conference later this year to require industrial nations to reduce emissions. But the United States would agree to allow developing countries to negotiate similar reductions later.

The administration's "dual-track" approach brought sharp criticism at a Senate Foreign Relations subcommittee hearing yesterday. Both Democrats and Republicans maintained there is no assurance China, which in 15 years will overtake the United States as the leading carbon polluter, will take steps to deal with the climate problem.

"The developing countries would get off scot-free," said Sen. Robert C. Byrd, West Virginia Democrat, who criticized the administration for trying to bind the United States to specific reductions in so-called greenhouse gases, while settling for "vague promises" of future talks by developing countries.

Should such a treaty be signed at the climate conference in Japan in December, "there will be a mountain in the way" of getting it ratified, said Mr. Byrd. "The Senate will not approve this treaty."

A Senate resolution offered by Mr. Byrd and Sen. Chuck Hagel, Nebraska Republican, chairman of the subcommittee on international economic policy, calls on the administration not to commit the United States to pollution reductions unless developing countries make similar binding pledges. It already has the support of 61 senators, both Republicans and Democrats.

Undersecretary of State Timothy Wirth acknowledged it is essential that developing countries eventually join industrial nations in curbing emissions from burning fossil fuel, if the effort to deal with global warming is to succeed.

But he said countries such as China with emerging industries have objected to binding emission requirements at a time when industrial countries have yet to show actual reductions.

Mr. Wirth noted that the United States, with 5 percent of the world's population, accounts for 20 percent of the carbon dioxide going into the atmosphere. "We have got to demonstrate that we are willing — as the people who fouled the nest to begin with — to take steps to reduce emissions," he said.

Mr. Wirth said the United States and most of the other industrial countries will not achieve a stabilization of carbon emissions to 1990 levels by the end of the decade as they promised to do.

"Without some legal obligation countries will continue to pay only lip service to their efforts to solve the problem," Mr. Wirth told the lawmakers.

Sen. Paul S. Sarbanes, Maryland Democrat, said he also was troubled by the administration pursuing mandatory pollution reductions, while developing countries for the time being would be let off the hook.

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S.L.C.

105TH CONGRESS
1ST SESSION

S. RES. _____

IN THE SENATE OF THE UNITED STATES

Mr. BYRD submitted the following resolution; which was _____

RESOLUTION

Expressing the sense of the Senate regarding the conditions for the United States becoming a signatory to any international agreement on greenhouse gas emissions under the United Nations Framework Convention on Climate Change.

Whereas the United Nations Framework Convention on Climate Change (in this resolution referred to as the "Convention"), adopted in May 1992, entered into force in 1994 and is not yet fully implemented;

Whereas the Convention, intended to address climate change on a global basis, identifies the former Soviet Union and the countries of Eastern Europe and the Organization For Economic Co-operation and Development (OECD), including the United States, as "Annex I Parties", and the remaining 129 countries, including China, Mexico,

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India, Brazil, and South Korea, as "Developing Country Parties";

Whereas in April 1995, the Convention's "Conference of the Parties" adopted the so-called "Berlin Mandate";

Whereas the "Berlin Mandate" calls for the adoption, as soon as December 1997, in Kyoto, Japan, of a protocol or another legal instrument that strengthens commitments to limit greenhouse gas emissions by Annex I Parties for the post-2000 period and establishes a negotiation process called the "Ad Hoc Group on the Berlin Mandate";

Whereas the "Berlin Mandate" specifically exempts all Developing Country Parties from any new commitments in such negotiation process for the post-2000 period;

Whereas although the Convention, approved by the United States Senate, called on all signatory parties to adopt policies and programs aimed at limiting their greenhouse gas (GHG) emissions, in July 1996 the Undersecretary of State for Global Affairs called for the first time for "legally binding" emission limitation targets and timetables for Annex I Parties, a position reiterated by the Secretary of State in testimony before the Committee on Foreign Relations of the Senate on January 8, 1997;

Whereas greenhouse gas emissions of Developing Country Parties are rapidly increasing and are expected to surpass emissions of the United States and other OECD countries as early as 2015;

Whereas the Department of State has declared that it is critical for the Parties to the Convention to include Developing Country Parties in the next steps for global action and, therefore, has proposed that consideration of additional steps to include limitations on Developing Country

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Parties' greenhouse gas emissions would not begin until after a protocol or other legal instrument is adopted in Kyoto, Japan in December 1997;

Whereas the exemption for Developing Country Parties is inconsistent with the need for global action on climate change and is environmentally flawed;

Whereas the Senate strongly believes that the proposals under negotiation, because of the disparity of treatment between Annex I Parties and Developing Countries and the level of required emission reductions, could result in serious harm to the United States economy, including significant job loss, trade disadvantages, increased energy and consumer costs, or any combination thereof; and

Whereas it is desirable that a bipartisan group of Senators be appointed by the Majority and Minority Leaders of the Senate for the purpose of monitoring the status of negotiations on Global Climate Change and reporting periodically to the Senate on those negotiations: Now, therefore, be it

1 *Resolved*, That it is the sense of the Senate that—

2 (1) the United States should not be a signatory
3 to any protocol to, or other agreement regarding, the
4 United Nations Framework Convention on Climate
5 Change of 1992, at negotiations in Kyoto in Decem-
6 ber 1997, or thereafter, which would—

7 (A) mandate new commitments to limit or
8 reduce greenhouse gas emissions for the Annex
9 I Parties, unless the protocol or other agree-
10 ment also mandates new specific scheduled

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S.L.C.

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1 commitments to limit or reduce greenhouse gas
2 emissions for Developing Country Parties with-
3 in the same compliance period, or

4 (B) would result in serious harm to the
5 economy of the United States; and

6 (2) any such protocol or other agreement which
7 would require the advice and consent of the Senate
8 to ratification should be accompanied by a detailed
9 explanation of any legislation or regulatory actions
10 that may be required to implement the protocol or
11 other agreement and should also be accompanied by
12 an analysis of the detailed financial costs and other
13 impacts on the economy of the United States which
14 would be incurred by the implementation of the pro-
15 tocol or other agreement.

16 SEC. 2. The Secretary of the Senate shall transmit
17 a copy of this resolution to the President.

**White House Climate Change Task Force**

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

cc: Ann
TAF
JS
AM
JDR

MEMORANDUM TO: ASSISTANT SECRETARIES GROUP

FROM: Dirk Forrister, Chair
White House Climate Change Task Force

SUBJECT: ATTACHED SECTORS SUMMARY PAPER

As you may recall, the Assistant Secretaries Group charged Jeffrey Hunker to write a paper on the sectoral implications of climate change policy. The attached paper is a much shorter version of the Sectors paper we received a month ago. My thanks to Jeff Hunker, Skip Laitner, and the many staff from all of the agencies who have worked on this paper over the past six weeks.

We would appreciate your review of the new draft. Please provide comments to Judi Greenwald of our Task Force by Thursday, July 3. Our fax number is 343-1163. Judi's new e-mail address is greenwald_j@btgcinema.com. My plan is to incorporate your comments and forward the paper to Katie McGinty and Dan Tarullo for their consideration the following week. This paper will be used as part of the discussions with individual industry and labor representatives on how we minimize the impacts and maximize the opportunities of climate change mitigation policies. Thus your immediate attention would be much appreciated.

OPTIONAL FORM 99 (7-90) *please be sure both recipients get this fax. Thanks*

FAX TRANSMITTAL		# of pages = 30
To <i>Alicia Munnet / CEA</i>	From <i>VIRGINIA CORSEVERI</i>	
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* This fax will be transmitted in 2 parts
cover page → p. 16
p. 17 → 25.
Please be sure to combine parts one and two.

**SECTOR EMISSIONS AND OPPORTUNITIES FOR MITIGATION
UNDER A CLIMATE CHANGE MITIGATION STRATEGY**

*A Pre-Decisional Draft
Do Not Cite or Quote*

June 30, 1997

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Introduction

In a June 27, 1997 speech to a United Nations environmental conference, President Clinton acknowledged that "concentrations of greenhouse gases in the atmosphere are at their highest levels in more than 200,000 years and climbing sharply." If that trend does not change, the President noted that the resulting climate changes would "disrupt agriculture, cause severe droughts and floods and the spread of infectious diseases." In underscoring the fact that no nation can escape the danger of climate change, the President stated that: "We must create new technologies and develop new strategies like emissions trading that will both curtail pollution and support continued economic growth. We owe that in the developed world to ourselves, and equally to those in the developing nations. Many of the technologies that will help us to meet the new air quality standards in America can also help address climate change. This is a challenge we must undertake immediately."

Drawing on the guidance of the President's statement to the United Nations, it is clear that any future climate change policies adopted by the United States should be anchored by a technology-based investment strategy. Such a strategy will focus on the diffusion of cost-effective technologies that are now available but underutilized, even as we continue efforts to develop new technologies. Yet, the sectors of the economy vary widely in how they produce goods and services. For that reason, the impact of future climate policies — as well as the technologies available to respond those policies — will also vary widely. This is true for both the sectors as a whole and for the individual firms within those sectors. For policy makers and for business and labor leaders, it is important to understand these different impacts and opportunities.

Sources of U.S. Greenhouse Gas Emissions

Greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and ozone (O₃). Chlorofluorocarbons (CFCs) and partially halogenated fluorocarbons (HCFCs), a family of human-made compounds, their substitutes hydrofluorocarbons (HFCs), and other compounds such as perfluorinated carbons (PFCs), are also greenhouse gases. Of these gases, CO₂ accounts for the largest share by far of all anthropogenic emissions and is primarily the result of fossil fuel combustion for energy use. The greenhouse gas emissions are typically measured in "carbon equivalents," according to their respective "global warming potential."

Total U.S. greenhouse gas emissions in 1995 were 1,557 MMTCe (million metric tons of carbon equivalent), with gross emissions of 1,674 MMTCe offset by 117 MMTCe of carbon sequestered by the nation's forests. Since 1990 energy-related carbon emissions have increased by about 10 percent to 1,467 MMT in 1997. They are expected to grow 1.2 percent annually, reaching 1,722 MMT by 2010.

U.S. Carbon Emissions by Fuel

Petroleum products are the leading source of carbon emissions from energy use and nearly 80 percent of the petroleum emissions result from transportation. Coal is the second leading source of carbon emissions, with most of the projected future increases in emissions from coal result from electricity generation.

Table 1. U.S. Carbon Emissions by Fuel Type

	1997	Percentage of Total 1995 Emissions	2010	Percentage of Total 2010 Emissions
Petroleum	613	42%	730	42%
Natural Gas	335	23%	412	24%
Coal	519	35%	579	34%
Other (includes methanol and liquid hydrogen)	0	0%	1	0%
TOTAL	1467	100%	1722	100%

Source: EIA Annual Energy Outlook 1997

U.S. Carbon Emissions by End-Use Sector

End-use sectors include the following: residential and commercial (collectively called "buildings"), industrial, and transportation. Emissions from each of these sectors are roughly equally distributed among the three: buildings (35%), industry (33%), and transportation (32%). These shares are projected to remain fairly constant through the year 2010 and beyond. The most diverse of the end-use sectors is that of industry, which consists of farming, agricultural services, fisheries, forestry, mining, construction, and manufacturing.

Table 2. U.S. Energy-Related Carbon Emissions by Major End-Use Sector

	1997	Percentage of Total 1997 Emissions	2010	Percentage of Total 2010 Emissions
Buildings	512	35%	576	33%
Industry	471	33%	548	32%
Transportation	485	32%	598	35%
TOTAL	1467	100%	1722	100%

Source: EIA Annual Energy Outlook 1997

Energy End-Use Sectors

The Buildings Sector

Residential and commercial end uses combined to consume 35 percent of the nation's total energy requirements in 1997. The major components of energy use within the buildings sector are summarized in Table 3 on the following page.

Table 3. 1997 Building Energy Consumption by End-Use

End Use	Percentage of Total
Space Heating	26%
Space Cooling	9.4%
Water Heating	10.8%
Refrigeration	4.9%
Lighting	14.9%
Cooking	2.6%
Other Appliances	31.5%
Total	100%

Source: EIA Annual Energy Outlook 1997

Residential primary energy use per household has declined only two percent in the period 1979 to 1995. According to the Energy Information Administration's *Annual Energy Outlook 1997* (AEO97), total energy consumption in the residential sector is projected to increase by 9 percent between 1997 and 2010. Most of the growth in this sector is expected occur in the "other uses" category, which includes items such as electronic equipment and small appliances. Not surprisingly, therefore, most of the increase in energy demand during this period is attributed to greater use of electricity.

Measured in terms of energy use per square foot of building space, the commercial sector has witnessed improvements in energy efficiency on the order of 30 percent between 1979 and 1992. However, total energy consumption has been rising over the past two decades as a result of overall growth of the commercial sector. Future energy demand is also predicted to increase by 9 percent in the period 1997-2010. As is the case with the residential sector, end-use products such as office equipment and consumer electronics account for the majority of net growth in energy demand through 2010.

Table 4 summarizes the category of end-use energy in the combined buildings sector for the years 1997 and 2015.

Table 4. Total 1997 and 2015 Building Energy Consumption By End-Use (in Quads)

	1997	2010	Percent Change
Space Heating	8.77	8.85	0.9%
Space Cooling	3.17	3.09	-2.3%
Water Heating	3.63	3.69	1.5%
Refrigeration	1.67	1.42	-14.6%
Lighting	5.04	5.04	-0.2%
Cooking	0.87	0.89	2.3%
Other Uses/Appliances	10.62	13.84	30.3%
Total	33.77	36.81	9.0%

Source: EIA Annual Energy Outlook 1997

Table 4 shows that most of the growth in building energy demand will occur in the "other uses" category, growing by 30 percent in the period 1997 through 2010. This category currently accounts for nearly 32 percent of total building energy use and is expected to increase to 38 percent in 2010 as small appliances and office equipment continue to penetrate the market. In the residential sector, this category of end-uses includes personal computers, dishwashers, clothes washers, and dryers. For the commercial sector this includes office equipment such as personal computers, monitors, fax machines, copiers, printers, scanners and multifunction devices. Additional products included in the "other" category include new telecommunications technologies, medical imaging equipment and vending machines.

Factors Shaping Industry Response

Currently, numerous opportunities exist to improve the level of energy efficiency within the buildings sector. By tightening the building shell and installing properly sized, energy efficient heating and cooling equipment, consumers can experience substantial monetary gains through greater savings as a result of lower monthly utility bills. In addition to saving money, consumers can benefit from improved overall comfort resulting from better indoor air quality, superior lighting, and reduced noise levels. However, the savings are often hard to verify, sometimes varying from building to building. Although consumers have clearly accepted improved insulation levels and some other energy savings features, it is not clear whether or when the more complicated or advanced savings opportunities will achieve significant market penetration.

Technology Options

Cost effective technologies which are currently available in the buildings sectors include, but are not limited to, the following:

- Better insulation of building shells
- Better control systems for regulating the use of energy consuming equipment (time and temperature controls by zone, energy-use optimizers, energy management systems)

- High efficiency heat pumps
- Heat pump water heaters
- Decreased hot water requirements through better designed clothes washers and dishwashers
- Increased motor/compressor efficiencies for refrigerators
- High efficiency lighting – fluorescent fixtures, electronic ballasts, control systems
- Substitution of lower-carbon fuels (on a full fuel-cycle basis)
- Reduced air infiltration practices, including improved duct work
- Energy efficient windows
- Whole house design that allows for substantial equipment downsizing

Barriers to Adoption

Despite the proven cost effectiveness of these and other energy efficiency technologies, it is clear that they are not widely adopted by consumers. This is due to a number of institutional, organizational, and other barriers. The existence or availability of a financially attractive technology does not by itself mean the technology will be purchased and used in sizable quantities. For high rates of market penetration, a number of other key factors must be in place:

- Potential buyers of products need to know about the technology
- Potential buyers need clear, reliable information on the performance and economic benefits of the technology
- Potential buyers must be the ones to see the benefits of lower energy bills
- Service providers and users of the technologies must have expertise to appropriately design for, install, and operate the technology
- Sources of capital must understand the low-risk nature of these investments

The Department of Energy (DOE), the Environmental Protection Agency (EPA), and members of the financial community are developing innovative financing methods for energy efficiency investments. In addition, DOE operates a program of test procedures, energy conservation standards, and labeling for certain major energy using equipment in the residential and commercial sectors. These include refrigerators, freezers, air conditioners, water heaters, furnaces, dishwashers, clothes washers, clothes dryers and kitchen ranges, ovens, commercial heating and air-conditioning equipment, certain incandescent and fluorescent lamps, distribution transformers, and electric motors. The Energy Policy Act of 1992 (EPACT) also established maximum water flow-rate requirements for certain plumbing products and provided for voluntary testing and consumer information programs for office equipment, luminaires, and windows. Our nation has made significant progress in overcoming these barriers, but more needs to be done to meet the challenge of climate change.

The Industrial Sector

The industrial sector consists of an extremely diverse set of business enterprises — both in terms of products and processes. It includes agriculture, mining, construction and manufacturing. Even within individual subsectors, a range of activities exist that have vastly different energy use patterns and carbon emission profiles. Agriculture includes, for example, both ranching and farming. Mining includes the extraction of both energy and non-energy mineral resources. Construction ranges from the building of new homes, offices, highways, and power plants to the maintenance and repair of those same facilities. Finally, the manufacturing subsector incorporates a range of industries that produce beer, paper, and clothing on the one hand, and aluminum ingots, plastic resins, cars, and

computers on the other. Energy requirements for each of these industries are as different as the products they produce.

Trends in the Industrial Sector

Broadly speaking, industrial activity will grow by about 2.35 percent annually in the period 1997 through 2010. Yet, from the perspective of energy use and overall carbon emissions, there are significant differences within the many subsectors. For convenience, such activity can be categorized into those subsectors which are energy-intensive and those which are not. Output in the energy-intensive industries — including chemicals, petroleum refining, pulp and paper, glass, cement, iron and steel, and aluminum — will grow by 1.34 percent annually through 2010. The energy intensity of those subsectors will decline by only 0.53 percent. In contrast, output in the non-energy-intensive industries will increase by 2.65 percent annually while their energy intensity will decline 1.23 percent per year. Despite the more rapid decline in energy intensity, the more rapid growth in economic activity means that overall energy use (and, hence, increases in carbon emissions) will increase more quickly in the non-energy-intensive industrial subsectors.

Table 5. 1997 Comparison of Energy Intensive and Non-Intensive Industrial Subsectors

	Output (Billions of 1987 Dollars)	Annual Growth Rate	Energy Use (Trillion Btus)	Energy Intensity (1000 Btus per Dollar of Output)	Annual Change in Energy Intensity
Energy- Intensive	920	1.34%	17,197	18.7	-0.53%
Other	2,847	2.65%	17,224	6.1	-1.23%
Total	3,767	2.35%	34,421	9.1	-1.22%

Source: EIA Annual Energy Outlook 1997

Carbon emissions in the industrial sector are the result of two different types of processes. The first is the combustion of fossil-fuel resources while the second involves non-energy related production processes. The energy-related emissions, estimated to be about 471 MMT in 1997, account for about 96 percent of total carbon emissions. This includes emissions from electricity generation which are distributed across all the industrial sectors. According to the AEO97 forecast, this is expected to grow to 548 MMT by 2010, and 16 percent increase over 1997 levels. Unfortunately, emissions data for individual industrial sectors are not currently reported in any published sources.

In addition to emissions resulting from the combustion of fossil fuels, the primary industrial processes that generate carbon emissions include:

- the manufacture and consumption of limestone (e.g., in iron smelting, steelmaking, glass manufacture, flue gas desulfurization)
- dolomite consumption
- soda ash manufacture and consumption (e.g., in glass manufacture, flue gas desulfurization, and chemicals production)

- carbon dioxide manufacture
- aluminum production

One example of non-energy related process emission occurs in the production of cement. The calcination reaction which converts the limestone raw material into clinker generates direct emissions of approximately 11 MMT. This is based upon 1995 data, the latest available at this time. Total non-energy related processes contributed a total of perhaps 21 million MMT of carbon emissions in 1995.

Economic Modeling Results for the Industrial Sector

There are a variety of models and analyses which have been used to characterize the impacts of climate policies on the industrial sectors. A June 1997 study by a consortium of non-profit groups, for example, estimated that carbon emissions could be stabilized below 1990 levels with an overall net benefit to the economy. The reason is that cost-effective energy efficiency improvements and productivity gains were shown to offset the increased energy prices stimulated by proposed climate policies (*Energy Innovations*, 1997). The Interagency Analytical Team (IAT) also used aggressive technology investment assumptions in an analysis with the Markal-Macro model to show that the cost of energy services could actually be about 3.0 percent lower for all sectors in the year 2010 and beyond — despite the higher energy prices resulting from a cap in carbon emissions. This result contributed to a net positive (albeit small) GDP benefit showing up as early as the year 2000.

To analyze the impacts of climate policies on specific industries, however, the IAT employed the DRI/McGraw-Hill Inter-Industry Model. The model calculates production, detailed inter-industry transactions and trade for 246 industries, using production and trade data from the DRI Macroeconomic Model and detailed projections of changes in efficiency and productivity over time.

Under the "central stabilization case," which estimates the effects of stabilizing carbon emissions at 1990 levels from the year 2010 through 2020, direct emissions reductions in the industrial sector account for about 19 percent of total emission reductions (48 MMT) in 2010 and 21 percent (70 MMT) in 2020. Reductions in overall energy demand as well as improvements in industrial energy efficiency account for these reductions. Also under the central stabilization case, energy intensity across all industries initially declines at a rate of 2.6 percent per year vs. 1.5 percent in the base case and later slows to about 1.5 percent per year versus 0.9 percent in the base case.

One major area of concern is the effect of carbon constraints on the energy-intensive industries which account for only one-fourth of total industrial output but one-half of total industrial energy use. These concerns reflect both domestic demand, and international competitiveness.

The impact of climate stabilization policies on the demand for energy-intensive industrial products may be very sensitive to how the policy is implemented.

- *If emission permits are auctioned off and the revenues are used to reduce the budget deficit, the reduction in government borrowing will reduce real interest rates and, in turn, stimulate demand for consumer durables, new construction and business investment. Higher construction, investment, and durables demand raises the demand for such energy-intensive goods as cement, aluminum, and steel. Pulp and paper products, energy-intensive chemicals and other energy intensive products more closely tied to non-durable consumer good consumption -- pulp and paper products, and some chemicals -- fair less well under this scenario.*

- *In contrast, if emission permits are given to households (or the revenues from auctioned permits are returned to them through income tax reductions), the main effect is to stimulate household consumption expenditures rather than business investment. In this case, higher non-durables consumption stimulates the demand for paper and paperboard from the pulp and paper industry.*

A second and central concern is the following: as higher energy prices raise production costs, U.S. energy-intensive producers might lose market share to competitors from non-Annex I countries under a climate treaty that affects Annex I but not Annex II countries.

The results of the DRI model provides a midpoint in the ranges of other studies, which either tend to predict that carbon stabilization policies would have only minimal impacts initially, and even a small positive in later years as energy-intensive industries begin to implement offsetting productivity investments, or which predict severe impacts that could perhaps drive large portions of these industries overseas, with little net effect on global emissions. The results from DRI analysis show that while a carbon stabilization policy would affect energy-intensive industries, the most dire predictions overstate the impacts of climate policies. For the policy cases, other than for oil and coal, the impacts on output for energy intensive industries relative to the base case are less than 1.9 percent assuming no international emissions trading, and less than 1.2 percent with international trading.

Geographic and regional shifts in global energy-intensive production are inevitable even without a climate policy. For instance, according to the DRI Baseline Forecast, the carbon and energy intensive industries in the U.S. will experience declines in their share of both U.S. employment and output. These industries are projected to employ only 2.9 percent of the U.S. workforce by 2010. This figure decreases to 2.3 percent by 2020. Similarly, the energy intensive industries share of output drops from 9.1 percent of GDP or 27.9 percent manufacturing output in 2010 to 7.2 percent of GDP or 23.3 percent of manufacturing output in 2020. Even in the baseline, emerging Asian countries share of basic metals exports is expected to increase from 11 percent to 17 percent by the year 2010, and chemicals and plastics exports are forecast to increase from 13 percent to 19 percent.

The IAT's DRI analysis did account for changes in terms of trade for U.S. industries. Under this analysis, non-Annex I producers (including China Mexico, Korea and Brazil), which currently account for about 40 percent of U.S. imports, would not be faced with energy price increases from a stabilization. If that were to occur, there would be an increase in imports from non-Annex-I countries and decreases of U.S. exports to the world market. Yet, the relatively rigid representation of substitution possibilities in production that characterizes the DRI model may overstate the effect of energy price increases on production costs. In contrast to the DRI model, models that have a more detailed and flexible representation of production technologies (such as general equilibrium models) or that represent technological shifts (i.e. from integrated steel mills to electrometallurgical mini-mills or from primary aluminum to secondary aluminum) would yield lower estimates of production cost increases. As the Markal-Macro results have shown, depending on the depth of technological substitution that is available to industries, the overall result may even show a slightly positive GDP benefit over time.

Factors Shaping Industry Response

Within the manufacturing subsector, several industries are substantially more energy intensive than others. And among these energy-intensive industries, numerous differences exist in terms of the products each industry produces and the processes they employ.

Aluminum

The aluminum industry has three major segments - primary materials, semifabricated materials, and finished products. The U.S. aluminum industry is globally competitive in all parts of the industry and is a net exporter of semifabricated aluminum products. The last greenfield smelter in the U.S. was built in 1980 and there are currently no plans to build any new facilities.

Unlike other basic industries, the U.S. aluminum industry is highly dependent upon the cost of electricity, such that any future changes due to restructuring would have major impacts on the competitiveness of this industry. The primary aluminum industry in the U.S. purchases electricity at approximately half the price of other industries, in part because of hydropower (Pacific Northwest) and in part because of long-term negotiated rates. The future of U.S. primary aluminum will depend on differences (if any) in the price and availability of hydro- and coal-generated electricity. These differences will have substantial regional impacts. Almost all the smelters in the eastern part of the United States rely upon coal-based electricity, whereas the smelters in the Northwest use hydro-based electricity. Should a policy be implemented based on carbon emissions, the eastern smelters in the United States would be impacted more than western smelters.

Technological change in the aluminum industry has been incremental. Continuous process improvements have reduced energy consumption per ton by approximately 25 percent between 1960 and 1994 and retrofit technologies with significant improvements in existing energy efficiency levels are expected to be in place by 2010. Increased use of recycled metal could also yield substantial energy savings. This depends on developing advanced scrap separation and smelting processes and on overall advances in process design.

Petroleum Refining

Petroleum refineries distill crude oil, crack the resultant intermediate products into smaller molecules, and then purify and blend the various fuels to produce a number of useful products. Gasoline is the principle refinery product, accounting for over half of industry sales. U.S. refining industry is the largest in the world with capacity at about 15 million barrels per day (bpd). However, no new refineries have been built in the U.S. for more than a decade and the number of refineries has decreased from about 285 in the late 1960s to about 175 currently.

In the petroleum refining sector, industry impacts will depend on sensitivities such as the extent to which prices of fuel used as an input are increased as opposed to policies that affect the overall demand for the refinery products produced. Other factors that will affect the petroleum refining industry include the price of marine bunker fuel which can account for 25 to 55 percent of transportation costs. The characteristics of individual refineries will also affect the response of the industry. The refineries most vulnerable are located in highly competitive regions, they are typically old, and they produce a standardized product subject to a high degree of competition. Many of the old refineries are only marginally profitable under existing conditions. Less affected refineries will be those that have been renovated and modernized in the last five years, or produce specialized products.

In the near to mid-term, process energy utilization can be reduced by 5-10 percent through utility system modifications, monitoring and maintaining equipment/process energy efficiency through development and adoption of advanced sensor/control technologies, and by minimizing and controlling heat exchanger fouling. In the mid to long-term, opportunities to improve energy efficiency include areas such as fired heaters, distillation catalytic hydrocracking, reforming and hydrotreating,

alkylation, and hydrogen production.

Glass

The manufacture of glass and glass products in the U.S. is a large, widely diversified, energy-intensive industry. The glass industry includes the following four segments: glass packaging, fiberglass, flat glass, and specialty glass. The diversified nature of the glass industry highlights the fact that competitive challenges faced by one sector will not always be applicable to the other sectors, and solutions must be tailor-made as well.

The two most pressing challenges for the glass industry are competition from other materials such as plastic and aluminum, and competition from foreign glass manufacturers with lower labor and environmental compliance costs. To meet these challenges the industry will need to improve manufacturing processes, create additional markets and uses for glass products, and reduce energy and waste disposal costs. Reduction in energy consumption, as well as the increased use of recycled glass, both support reduction in greenhouse gases through reductions in fuel combustion.

Options to improve energy efficiency in the glass industry include technological advances that accomplish the following:

- enable the use of oxygen rather than air to fire glass furnaces,
- increase the use of waste glass, or cullet, in glass manufacturing,
- lead to the new coatings and new structural components needed to enhance the performance of manufacturing equipment, and
- create new temperature sensors for furnaces to increase energy efficiency.

Steel

The U.S. steel industry is comprised of integrated producers, electric arc furnace (EAF) based mills, and specialty steel producers. Manufacturing processes for iron and steel production have changed considerably since the 1980s. The open hearth furnace, which was the workhorse of integrated mills in the 1950s, is now obsolete. The basic oxygen furnace (BOF), however, held on to a relatively constant share of total production during the same period, although this share has begun to fall gradually since 1992 with the rise of steel mini-mills. These mini-mills use electric arc furnaces which use 100 percent scrap metal and therefore require less energy per ton of steel produced. Mini-mills are highly dependent on the price and availability of electricity and scrap.

Over the next five years, steelmaking capacity in the U.S. is expected to increase significantly as many new EAF-based mills are scheduled to come on line. As the percentage of EAF-based steel production increases, the average energy intensity of steelmaking will decrease, with associated decreases in coal use and increases in electricity use (and corresponding changes in the amount and type of emissions). In addition, this increase in EAF capacity will likely affect steel imports and domestic scrap prices. Measures that increase coal prices would have a far more dramatic impact on integrated mills than on EAF facilities, while all of the industry will be affected by increases or decreases in electricity price. Deregulation of the electric utility industry is expected to benefit the industry by lowering electricity prices.

After a historical record of lagging technologically, the U.S. steel industry has begun to exhibit a high

rate of technological change, including direct smelting processes that replace the blast furnace and coke oven, and direct strip casting processes that replace the continuous caster and hot strip mill.

Chemicals

The chemical industry is more diverse than virtually any other U.S. industry. Chemicals are the keystone of U.S. manufacturing, essential to a wide range of industries, such as pharmaceuticals, automobiles, textiles, paper, electronics, agriculture, construction, furniture, paint, and appliances. The U.S. is the world's largest producer of chemicals. More than 9000 corporations develop, manufacture, and market over 70,000 chemical products. Investments in plant and equipment have tripled since 1985 and R&D spending has more than doubled from \$8.3 to \$17.7 billion.

The chemical industry has reduced energy intensity over the last decade and has made strides in reducing the environmental impacts of chemicals production. However, to remain at the forefront of the global market and to maintain its competitive position, the industry will need to continue to take steps to strengthen market share, such as increased development of markets where the U.S. has a technological advantage. Improvements to energy, resource and process efficiency will also play an important role in the future competitiveness of the industry. The U. S. chemical industry has an excellent opportunity to greatly reduce U.S. industrial greenhouse gas emissions through advances in current and emerging separation technologies. Advances in separations technology and chemical processes are anticipated to strengthen the U.S. chemical industry and ensure its competitive edge in the increasing globalization of markets. They will allow the chemicals industry to balance and sustain society's demands for higher environmental performance with industry's demands for increased profitability and capital productivity.

Pulp and Paper

The U.S. has the world's largest installed pulp, paper, and paperboard production capacity, some 86 million air-dry metric tons (ADMT) per year in 1993, or about 30 percent of global capacity. Manufactured products from the paper and allied products industry include newsprint, printing and writing paper, tissue, paper plates, card stock, corrugated cardboard, cartons, and construction-grade paperboard. The U.S. is home to close to 550 pulp and paper mills located in 42 states. Over the last twenty years or so, many of the smaller, older mills have been closed down and replaced with larger integrated mills. The integrated mills produce both pulp and paper and/or paperboard. The trend is toward larger size (over 2000 tons/day) plants with the capability to consistently process high-quality products at higher speeds.

The U.S. pulp and paper is both capital and energy intensive. New capital expenditures in the last decade have averaged 10.4 percent of revenues, making paper and allied products the most capital intensive of the manufacturing industries. This factor could conceivably restrain the ability of the industry to install new technologies -- especially technologies that will not significantly contribute to lowering production costs. However, because of the energy-intensive nature of the industry, rising fossil fuel costs would create additional incentives to increase reliance on self-generated energy and further increase the energy efficiency of pulp and paper production processes.

There are major opportunities for improving the efficiency of process energy use in the pulp and paper industry. A number of new energy-saving process technologies such as digesters and paper or pulp dryers, are under development or recently commercialized and process heat integration analysis

has been applied in several mills. Most process specific changes that bring energy efficiency improvements also bring productivity and other improvements. Advanced biomass-based cogeneration systems, which would provide major improvements in efficiency over existing systems, are currently undergoing rapid development.

Cement

The U.S. hydraulic cement industry consists of firms producing portland, masonry, prepared hydraulic, natural, lime, and oil well cements. Portland cement represents more than 95 percent of total hydraulic cement production; the remainder is mostly masonry cement. There are currently 47 cement companies operating close to 118 plants and 207 kilns in the U.S. Total industry shipments in 1995 were 75 million metric tons with total U.S. consumption of 86 million metric tons. There were approximately 11 million metric tons of finished cement imports and half a million metric tons of exports the same year.

Compared to world standards, the U.S. cement industry is characterized as aging and relatively inefficient. Plants continue to be shut down and others may be slated for closure due to technological or competitive obsolescence. Currently, there remains a need to replace and upgrade plants in order to increase productivity in domestic plants. Most major producers, however, are not in a good financial position to invest in extensive and expensive additional capacity. No new greenfield plants have been built in the U.S. in ten years.

Currently, 65-70 percent of U.S. cement capacity is foreign-owned — including three of the top five firms. Approximately 90 percent of cement imports are handled by domestic producers, who use imports to supplement domestic capacity, such that corporate profitability is not necessarily linked to the health of the domestic industry.

A number of opportunities exist to reduce emissions such as increasing the share of production using dry process technology, increasing the use of efficiency enhancing machinery such as particle classifiers which reduce grinding loads, increasing the use of mix-ins when making concrete, and fuel switching.

High-Growth Industries

Industries other than the energy-intensive subsectors discussed above also depend on energy and will likely be affected by climate change mitigation policy. Among the reasons for focusing attention on these sectors are that:

- Some of these industries are growing more rapidly than the energy-intensive industries. Most of the growth (64 percent) in industrial energy use from 1997-2010 will be by non-energy-intensive industry subsectors (3.4 of 5.3 quads).
- Service Industries employ 77% of the U.S. workforce and account for 74% of GDP. The distinction between service and manufacturing industries is becoming increasingly blurred.
- Opportunities exist for new technologies in high-growth sectors that have capital turnover rates that are higher than those of energy-intensive industries. With high rates of capital turnover, the opportunities to accelerate the diffusion and acceptance of energy efficient technologies are

substantial, and can collectively lead to significant reductions in carbon emissions.

- Under a climate change mitigation policy, industries involved in producing energy-saving products and providing energy services will benefit as demand increases for their products and services.

Non-Energy Minerals Industry

The non-energy mining includes the extraction of industrial minerals such as crushed stone, sand and gravel as well as metallic ores including iron, and copper. In 1992 the non-energy minerals industry had a production of \$32 billion dollars. As in coal mining (discussed more fully below), employment has been steadily declining since the early 1980s. Projections indicate that by the year 2000 this sector will employ 25 percent fewer people than in 1980, dropping from 236,000 to 176,000 jobs. As with other sectors, the minerals industry will be affected by rising prices resulting from efforts to stabilize carbon emissions. However, there are indications that the industry will be able to reduce overall energy consumption to at least partially offset increased energy prices. Among others, using high efficiency electric motors, incorporating new process improvements, increasing maintenance of motor vehicles, system conveyor belts, drives, and compressed air systems can each provide savings of 10 to 15 percent, conservatively.

Construction

The construction industry is as varied as it is large. It includes firms with thousands of employees and firms with just one. In 1992 there were just under 2 million construction establishments employing over 4.6 million persons. Combined, the construction industry performed business totaling almost \$582 billion in 1992. Although much of the construction industry rises and falls with fluctuations in the economy, the industry as a whole is likely to remain stable through the next 10 years, both in terms of employment and value of business.

Much of the construction industry is labor intensive. Most construction work involves using small trucks to transport workers and materials, and hand and power tools, and physical labor to complete work. It is one of the least energy intensive industries in the nation. Energy costs (including selected power, fuels, and lubricants) account for approximately 1.6 percent of each dollar of business done in the construction industry as a whole. Nevertheless, there are important opportunities to reduce energy costs within the industry. These opportunities range from using more efficient motor vehicles to incorporating the use new building materials (e.g., laminated beams, recycled products, engineered lumber products such as roof and floor trusses, insulated wall panels, and modular components) that reduce both construction waste and costs.

Motor Vehicle and Related Industries

The motor vehicle industry is much more diverse than the mere manufacture of new cars and trucks. It also includes road construction and maintenance, freight and passenger services, petroleum refining and wholesale distribution, and automotive sales and services. Total employment in these related industries approaches 7 million persons, providing about 7 percent of the nation's jobs.

Focusing only on the automobiles industry, most analysts see little or no change in the sales of cars and trucks over the next few years. This means that competition will be fierce among the 26 firms

that serve the major developed markets worldwide, including the so-called Big Three automakers — Ford, Chrysler, and General Motors. Within a decade some analysts project that, either as a result of sharing manufacturing resources, or as a result of mergers and acquisitions, as few as 10 “mega-manufacturing alliances” may serve all of the developed countries.

Continuing productivity gains among the U.S. automakers has strengthened its overall economic position. The number of employees per hundred vehicles sold, for example, has fallen 2.9 percent per year in the decade ending 1994. At the same time, the industry should be fairly unaffected by greenhouse gas emissions policies. This is due to the fact that the assembly of motor vehicles requires only about 15 million Btu of energy per car. If carbon prices rose as high as \$100 per ton, for example, this would add between 0.1 and 0.2 percent to the cost of manufacturing a new car. On the other hand, new car and truck sales might slip as the cost of driving increases as a result of climate policies. But new technologies can be incorporated into the design and construction of both light and heavy duty vehicles to reduce the overall cost of driving despite the prospect of initially higher gasoline prices. Technology improvements include engine designs that reduce friction and increase combustion efficiency and body designs that decrease the aerodynamic drag on the vehicle. Meeting the PNGV goals of an 80 MPG car that costs no more than today's vehicles (see the discussion on transportation below) will go a long way to minimize the impacts on both the auto industry and the many related industries.

Barriers to Adoption

From the above discussion, it is clear that numerous energy-saving technologies are available in the industrial sector — many of which offer additional benefits such as improved product quality. Despite this, however, many of these industries have historically avoided investing in energy efficiency technologies. Several factors help to explain why this may be the case.

For most industries, energy expenditures represent a minor portion of their operating costs, averaging less than two percent of value of shipments for the manufacturing sector. Industries such as primary aluminum, hydraulic cement and industrial gases are notable exceptions, with energy accounting for more than 20 percent of value of shipments. However, for some of the fastest growing industries, such as electronics and computers, energy expenditures represent only 1.2 and 0.6 percent of shipments respectively. In most industries, larger costs, such as labor and raw materials, receive attention before energy. For example, employee compensation averaged 24 percent of shipments in 1994.¹

Opportunities for energy efficiency improvements must compete with other issues for finite resources within a company. While capital is the most often cited resource, staff time may be of equal or greater importance. Downsizing is common when industrial companies undergo restructuring, resulting in fewer total personnel available to address all issues. When a choice must be made between addressing a potential emissions-compliance, production-reliability or product-quality problem, and identifying and implementing energy efficiency projects, the former receives the attention since failure to do so may result in the plant being shut down. One manifestation of this staffing constraint is the reduction in the number of corporate energy managers²

1. “Considerations in the Estimation of Costs and Benefits of Industrial Energy Efficiency Projects,” ACEEE/EPA

2. Ibid.

Many businesses operate with a tight constraint on their capital budgeting. Hence, the allocation of capital remains a significant barrier to achieving greater levels of energy efficiency. Given a choice between expanding existing production capability and introducing new products, and reducing energy bills, the production-related projects will invariably win out. Hence, presenting projects based on total benefits will likely be more effective than building a case on the energy savings alone.

The Transportation Sector

Trends in the Transportation Sector

Over the last decade, new light vehicle fuel economy has remained relatively flat in the U.S. This is due to both an absence of increased fuel-efficiency standards and a lack of consumer demand for greater fuel efficiency. As fuel prices declined following the oil shocks on the 1970s, consumers began turning away from fuel economy and looked more toward amenities such as speed, acceleration, size, and greater utility when making their purchasing decisions. Corporate average fuel economy of the new light vehicle fleets (i.e., cars and light trucks such as minivans, sport utility vehicles, and pickup trucks) grew along with increasing CAFE standards throughout the late 1970s until the mid 1980s. Since 1982, however, the average horsepower rating of the combined new light vehicle fleet (cars plus light trucks) has increased by 60 percent while the average fuel economy of the same fleet has remained unchanged. Had new cars sold in 1996 retained the same average acceleration performance and weight as new cars sold in 1984, the technologies actually incorporated into the fleet during this period could have increased new car fuel economy by about five miles per gallon, or close to 20 percent.

In addition, the share of light trucks is increasing, having gone from under 25 percent of the market in 1982 to almost 45 percent today. Light trucks face lower CAFE standards than cars (almost 7 mpg lower). Moreover, since light trucks tend to last longer than cars, they are likely to be driven more miles over their lifetime than cars.

Contribution to Greenhouse Gas Emissions

Passenger cars and light-duty trucks contribute the majority of transportation emissions. Emissions from light-duty vehicles alone accounted for 20 percent of total U.S. greenhouse gas emissions in 1990, and in the absence of new policy measures are expected to rise from about 250 MMTC in 1990 to 350-400 MMTC in 2010. Energy use in trucks used for commercial transport is only about 40 percent of energy used in passenger vehicles, but is growing significantly faster.

The major factors underlying the rapid increase in emissions from light-duty vehicles are growth in VMT, stagnant new fleet fuel economy levels (miles per gallon, or mpg), and growth in the relative proportion of light trucks sold, which have lower (i.e., less stringent) CAFE standards than cars.

Actual growth in VMT since 1990 has averaged 2.4 percent per year. Growth in VMT is a function of a number of factors, including demographic changes (e.g., more women in the workforce; immigration), land use patterns, the cost of driving each mile (now at an all-time low on an inflation-adjusted basis), among others.

Factors Shaping Industry Response

With consumers continuing to exhibit preferences for performance, size, and utility rather than fuel economy, no significant increase in new fleet fuel economy is expected to occur absent a driving force such as policy changes or fuel price increases.

Technology Trends and Options

Three principal ways exist to reduce carbon emissions from light vehicles: (1) reduce vehicle miles traveled (VMT); (2) improve fuel economy; and (3) use fuels with lower life-cycle carbon emissions. Work developed for the "Car Talk" committee³ suggested estimated reductions of 445 to 585 MMT would be possible in the period 2005 to 2025 from a combined package of land-use and transit policies as well as efforts to improve overall fuel economy and reduce the carbon content of transportation fuels.

Reducing VMT would involve a wide mix of policies. The goals would be to encourage land use away from auto dependency, and shift the relative (full) cost of driving versus other transportation/communication alternatives such as workplace parking subsidy reform, and shifting of state and local subsidies to cost-of-driving fees.

Improving fuel economy represents an important opportunity to reduce GHG emissions since only about 15 percent of the energy in gasoline is actually used to propel a typical vehicle. The Partnership for a New Generation of Vehicles (PNGV) builds on the prospect for an improved fuel economy. PNGV is a Federal-industry research partnership created in 1993 to encourage innovation in the US auto industry. The PNGV focuses on a research goal of tripling fuel economy of a typical 1994 family sedan by 2003-2004, while meeting or exceeding federal safety and emissions requirements, and without sacrificing performance, size, utility, or affordability. Most current PNGV work on this goal is focused on improving drive train efficiency, developing practical on-board energy storage systems, and reducing vehicle mass through the use of light weight materials. A pre-production prototype vehicle with a 100 percent improved fuel efficiency is expected in 2001; vehicles with 150-200 percent improved efficiency will be available in the 2005-2010 period.

Future technological innovations would come from technologies such as multi-valve engines, lighter materials, and next-generation tires, which have already been partially but not completely integrated into the new vehicle fleet. An additional component of the overall fuel economy improvement would be technologies such as direct injection engines and fully variable valve timing, still in the development stage.

Alternative fuels — such as biofuels — are another large opportunity for reducing transportation carbon emissions. Federal R&D has brought down the cost of biomass ethanol (from \$3.60 per gallon in 1980 to \$1.20 per gallon today). Further research has the goal further cost reductions to under \$0.70 per gallon by 2005, competitive with oil at its current price. Estimated carbon savings from use of ethanol largely as a gasoline blend is 20 MMTC in 2010.

3. The "Car-Talk" committee is the *Policy Dialogue Advisory Committee to Assist the President in the Development of Measures to Significantly Reduce Greenhouse Gas Emissions from Personal Motor Vehicles* formed in 1993 to see whether a consensus set of policies could be developed to return personal transport GHG emissions to 1990 levels by 2005, 2015 and 2025. The committee failed to agree on such policies, but substantial analytic results were developed by a team of government analysts working with several expert committee members.

Agriculture

Basic farm commodity production was about 0.9 percent of GDP in 1995 and accounted for about 1.2 percent of US employment. These numbers, however, belie the true importance of agriculture — the farm sector and agriculturally related industries in total account for about 13.5 percent of GDP and 17.3 percent of employment. Processing and distribution is the largest component and is relatively more labor intensive.

Contribution to Greenhouse Gas Emissions

Agricultural greenhouse emissions include methane, nitrous oxide, and carbon dioxide. Estimates of non-energy greenhouse gas emissions are relatively imprecise. While agriculture represents less than 5 percent of total national greenhouse gas emissions, it is an large source of methane and nitrous oxide.

The principle sources of agricultural methane are enteric fermentation (animal digestion) and manure management associated with livestock production. Applications of synthetic and organic fertilizers account for almost all of agriculture's N₂O emissions.

Globally, agriculture is a much more important source of GHG emissions than in the United States, accounting for about 20 percent of all greenhouse gas emissions. Agriculture's share of world emissions of CO₂, CH₄, and N₂O are estimated at 21-25 percent, 57 percent, and 65-80 percent respectively (excluding emissions from natural sources). Conversion of land to farm production (particularly tropical forests) is the major agricultural source of CO₂ emissions while rice and livestock production are the principle sources of CH₄ emissions.

Soil Carbon: Depletion or sequestration of soil carbon is a potentially important source of agricultural greenhouse gas emissions. Plants use photosynthesis to remove CO₂ from the atmosphere and convert it to carbon which is stored in plant biomass. Left undisturbed, soils accumulate some of this carbon as organic matter through root growth and decay of crop plant materials. Tillage is used to loosen surface soil and subsurface material, improve aeration and water infiltration, and control weeds. All benefit crop growth in the short-term. Tilling, however, also increases the exposure of soils to oxygen thereby accelerating the conversion of soil organic matter to CO₂, which is released into the atmosphere. Over time then, tilling reduces both soil carbon levels and soil productivity.

Reductions in soil carbon levels in U.S. agricultural soil (between 30 and 50 percent over the last 100 years) may have been a significant component of the historic increase in atmospheric CO₂ levels.

Factors Shaping Industry Response

Agricultural production is an energy intensive industry. Agricultural chemicals, particularly nitrogen fertilizer, are energy intensive. Transportation of agricultural commodities to market would also be affected. Some components of the food processing sector are energy intensive but, overall, the sector is less energy intensive than overall manufacturing.

For every dollar of farm output, 12 cents is spent on energy with electricity accounting for 6 cents. This reflects the increasing reliance on electricity for operations such as grain handling and large-scale confined livestock production. Agricultural chemicals embody 6 cents of energy for each dollar of

output, spent mainly on natural gas and electricity. Nitrogen fertilizer is among the most energy intensive chemicals and its availability is a key to high agricultural productivity. Energy cost increases would directly increase both agricultural production costs and agricultural chemical manufacturing costs.

Technology Trends and Options

The Climate Change Action Plan for the U.S. identified tree planting, research and outreach to help farmers better manage nitrogen use, methane capture from covered manure lagoons, and increased ruminant feed efficiency as opportunities to sequester carbon and reduce emissions of agricultural greenhouse gases.

Opportunities for further sequestering carbon in agriculture would include the following:

- Conversion of marginal cropland and pasture to forest: Forest growth currently offsets about 8 percent of total annual U.S. greenhouse gas emissions on a carbon equivalent basis. A number of studies have outlined the costs and economic benefits to U.S. agriculture resulting from strategies to mitigate U.S. greenhouse gas emissions by paying farmers to convert cropland and pasture to forest. Pulling the necessary quantities of land out of production, however, would raise land prices and would increase the cost of bidding land out of production.
- Promoting the use of management practices that increase the quantity of carbon stored in agricultural soils: Studies suggest that these sinks could technically offset a majority of U.S. greenhouse gas emissions, but economic analysis of such possibilities is limited.
- Using biofuels to replace fossil fuels: Because the carbon released in the burning of biofuels would be taken back up by the next crop, replacing fossil fuels with biofuels offers a means of increasing the amount of carbon that is recycled in the production and use of energy. The IPCC (1996) has estimated that for the world's temperate regions as a whole, carbon emissions could be reduced by 85 to 493 million tons per year by allocating 8 to 11 percent of their cropland to biofuel crops. While the United States' share of this is not addressed, the IPCC notes that the best mitigation opportunities are in areas with good agricultural land and surplus production.
- Further efforts to alter livestock management practices to reduce methane emissions: The most promising opportunities for reducing methane emissions in U.S. agriculture are in new management practices for the feeding of livestock and the handling of livestock waste (particularly cattle).

Energy Supply Sectors

Electric Power Generation

Historically, demand for electricity and economic growth have been closely correlated. Over the last twenty years, U.S. demand for electricity grew by approximately three percent per year, but this rate of demand growth is expected to decrease between now and 2010, averaging slightly more than one percent per year.

With several hundred billion dollars worth of combined capital investments, electric power generation

is one of the largest and most important economic sectors in the U.S. economy. The character of this industry has changed over time and is in the midst of another major restructuring. In 1995, FERC required open access to transmission for the purpose of wholesale competition. Currently over 80 percent of the states are moving toward electricity industry restructuring. Two broad trends can be noted. First, all the state decisions are leading to greater customer choice and second, there is a general trend to de-couple generation, transmission and distribution.

In addition to restructuring, the industry is undergoing a shift in the sources of generation. Nuclear energy is a carbon-free source of electricity that presently provides over 20 percent of U.S. electricity. Despite nuclear power's substantial contribution to today's electricity supply, no new nuclear power plants have been ordered by U.S. electricity generators since 1978. Although nuclear power generation was at an all-time high in 1995, the retirement of older plants and the lack of new nuclear projects will reduce nuclear in the future U.S. energy mix. Nuclear power plants are due to begin retiring in 2010 with most capacity retired by 2030. Fossil fuel power plants generated over 80 percent of U.S. electricity in 1970, but that share has fallen to about two-thirds as nuclear power's share has risen from virtually nil to about 22%; fossil generation is expected to return to about 80 percent over the next twenty years as the existing stock of nuclear plants are phased out.

Although the overall efficiency of fossil generation — the rate at which fossil energy is converted to electricity — has barely changed in the past 35 years, modest improvements are expected over the next twenty years as natural gas-fired generation doubles its share of total generation from about 15 percent today to over 30 percent. New natural gas-fired "combined cycle" power plants yield very high conversion efficiencies (> 50 percent) by generating steam from the waste heat of advanced combustion turbines and using it to drive steam turbines.

Renewable energy is forecast to have high growth but remain a small part of the base. Excluding hydroelectric power, whose expansion possibilities are very constrained, renewable electricity generation is expected to double over the next twenty years but will still account for less than 2 percent of total electricity generation. The hydro share of the energy market was 4.4 percent in 1996.

As state-by-state restructuring takes place, several states have already mandated minimum levels of renewable energy through "renewable portfolio standards," including Vermont, Maine, and Arizona. Many other states are considering similar measures to accelerate the adoption of renewable generation technologies. These technologies have become more competitive over the last twenty years. Photovoltaics have dropped from 90 cents per kilowatt-hr to under 20 cents per kilowatt-hour; wind technology has dropped from 25 to 5 cents per kilowatt-hr. Cost reduction will continue to occur through R&D advances and through economies of scale as production rates increase.

Contribution to Greenhouse Gas Emissions

The electric power industry is the largest direct energy consumer in the United States. Electric generators are responsible for 35 percent of national emissions of carbon dioxide, with over 85 percent of electricity-related emissions coming from coal-fired plants.

Table 6. Carbon Emissions from Electricity Generation (MMT)

	1997	Percentage of Total 1995 Emissions	2010	Percentage of Total 2010 Emissions
Petroleum	13	2%	12	2%
Natural Gas	55	11%	102	16%
Coal	454	87%	512	82%
Total	522	100%	626	100%

Source: EIA Annual Energy Outlook 1997

Factors Shaping Industry Response

Restructuring

Restructuring of the electric power industry offers a unique opportunity to mitigate future emissions of CO₂ from this sector. Many states are currently considering or adopting retail competition for their electric power markets. This trend may be accelerated with federal legislation. Retail competition may lower the price of electricity by as much as 20-25 percent in certain regions and change the fuel mix of generation. Restructuring without new environmental policies is expected to favor the expanded use of existing coal plants. These plants are largely depreciated, and hence can generate electricity for low incremental cost. To mitigate the environmental impacts of competition and maintain the environmental benefits of current state level renewable energy and demand side management programs, a number of options have been adopted or are under consideration. These include:

- A "portfolio standard" for renewable energy: This would require that all generators meet a specified level of renewable generation either by undertaking such projects themselves or purchasing "credits" from others who have.
- A social benefit fund: Revenues from a charge on transmission service are used to subsidize energy efficiency projects, renewable, R&D, or low income consumers. California has adopted this approach.
- Information disclosure requirements: Generators could be required to disclose the emission profiles of their generation, facilitating the marketing of "green" (or, less polluting) electricity.
- Leveling of the playing field for air pollutant requirements: Many states are hesitant to adopt retail competition because they perceive that differing regional environmental requirements put their electric industry at a competitive disadvantage and will result in more pollution being transported into their states. Thus, additional environmental provisions to "level the playing field" — which could include greenhouse gas emission reductions — are currently being debated. Adaption of fuel neutral standards would promote utilization of lower emission systems.
- Special consideration for energy efficient and/or low emission technologies: This includes advanced gas turbines and micro turbines for cogeneration and self-generation, fuel cells, and renewable technologies.

Distributed Generation

Distributed generation is the utilization of small power generation technologies dispersed through the distribution system to provide local power close to customers, thereby reducing investment in transmission and distribution resources and improving local reliability. This could include self-generation or cogeneration by industrial and building sectors and involve power sales back to the grid. Cost competitive technologies, such as smaller scale advanced gas turbines, are emerging which can compete economically with central station generation when full costs, including the avoided transmission and distribution expenditures, are considered. All of this will support the customer choice aspect of deregulation and lead to a reduction in cost of electricity for customers. The electric power producers will move from the concept of centralized power for economies of scale to providing energy services for customers. This will provide:

- economies of mass production of units
- smaller, cleaner generation
- fuel security through diversity of generation portfolio
- more options for customers to be green

Technology Trends and Options

Electric sector emissions can be reduced either by making generation less carbon intensive (e.g., conversion efficiency improvements, fuel switching, cogeneration, or renewables) or by reducing the amount of electricity demanded through increased penetration of more energy-efficient end-use technologies. Studies by the American Council for an Energy-Efficient Economy (ACEEE) show that there is a long-term potential to save about 25 percent of industrial electricity consumption at a cost that is significantly lower than the current cost of new generation units. For example, an industrial site which purchased coal-derived electricity generated at 35 percent efficiency could self-generate power in a cogeneration mode at 75-80 percent efficiency, selling power back to the grid and producing their own steam.

Many of the following technologies are projected to substantially increase their market share in the next decade.

- The next generation of natural gas technologies (including gas turbines and fuel cells) are projected to achieve energy conversion efficiencies of 70 percent or more by 2005.
- High efficiency coal-fueled power plants, such as integrated gasification combined cycle, are likely to realize efficiencies exceeding 55 percent and half the CO₂ emissions of current coal technologies.
- Renewable technologies — wind power, photovoltaics, solar thermal, and geothermal — have seen sharp cost reductions in the past two decades, some by a factor of ten.
- Options such as biomass gasification offer the ability to produce power with no net increase in CO₂ emissions. The growth of biomass offsets (sequesters) the CO₂ released in electric power production.

Petroleum

Contribution to Greenhouse Gases

Petroleum products are the leading source of carbon emissions from energy use. Petroleum accounted for 584 MMTC emissions in 1995, and this figure is predicted to increase to 718 MMTC by 2010. The majority (~80 percent) of petroleum emissions result from transportation use.

Factors Shaping Industry Response

Petroleum product demand is largely a function of the demand for transportation. Petroleum product consumption has been rising even though the amount of oil energy consumed per dollar of GDP has been falling since 1973. Oil energy per dollar consumed per dollar of GDP fell from 8,900 Btu/\$ in 1973 to an estimated 5,100 Btu/\$ in 1996, a drop of 43 percent. The ratio will remain at 5,100 Btu/\$ of GDP in 1997.

Coal

Electric utilities are the dominant consumers of coal. Overall consumption by utilities grew from 17 percent (84 million short tons) in 1949 to an 88 percent share (829 million short tons) in 1995. According to industry analysts, coal energy consumption will move up 1 percent in 1997 to 20.6 quads and coal's share of the energy market will remain at 22.7 percent. Coal consumption is expected to increase in future years along with the demand for electricity.

Contribution to Greenhouse Gas Emissions

Coal has the highest carbon content per unit of energy among fossil fuels — as well as being a source of pollutants such as sulfur dioxide. It is used primarily in the electricity sector, where coal-fired plants currently account for approximately 56 percent of total U.S. electricity production. Coal is the second leading source of carbon emissions, and is projected to produce 579 MMTC in 2010, compared to 507 MMTC in 1995. Even without consideration of the issue of greenhouse gas emissions, most analysts project that the great bulk of capacity additions to electric utility plants from now until at least 2010 will be fueled with natural gas rather than coal. Thus, while most existing coal-fired plants are highly competitive suppliers of power that are dispatched ahead of gas-fired plants on the basis of lower fuel costs, fuel cost advantages cannot offset the substantially higher capital costs of a coal plant when new capacity is needed.

Factors Shaping Industry Response

In the stabilization scenario, coal production is lower than in the baseline. In contrast, the NEMS stabilization scenario run under assumptions that allow for substantial "overbuilding" (early retirement) of existing coal capacity suggests a substantially greater decline in coal use than the DRI energy model analysis. The reduction in coal use from baseline in 2010 is twice as great — 58 percent vs. 29 percent.

Several factors contribute to the difference in perspectives. Most importantly, the large reductions in end-use energy demand in the DRI energy model provide "room" to use more coal that is simply unavailable in the NEMS stabilization scenario. In addition, the NEMS involves a larger reduction to reach stabilization, putting additional pressure on coal, the most carbon-intensive fossil fuel.

Changes in coal use due to greenhouse must be considered in the context of overall industry trends that are projected in the absence of any climate change action — despite output growth, employment in coal mining in 1995 is already less than half of 1980 levels. Therefore, notwithstanding rising coal consumption in the baseline case, national coal employment is projected to fall substantially — reflecting the fact that coal production productivity (tons per hour) rises at a much faster rate than EIAs coal consumption in all regions. There is also a continuing shift towards increased supply from regions where productivity is highest.

In the DRI energy model results, there is a smaller shift away from coal use (and production). However, DRI has even higher labor productivity growth assumptions than EIAs NEMS, which by itself reduces employment over time in both the base and mitigation policy cases.

Nuclear Energy

While the performance of existing nuclear electric power plants reached record levels in 1992, the number of operating reactors has leveled off. High operating costs, waste disposal difficulties, and other problems pose major challenges to the further expansion of nuclear electric power.

The future contribution of nuclear power depends on three factors: economic retirements of existing plants prior to the end of their license period, re-licensing of existing plants to extend beyond a 40-year service life, and level of new capacity builds.

Factors Shaping Industry Response

The baseline cases in the two energy models each project a modest level of economic retirements, operator decisions against pursuing relicensing, and no construction of new plants. As a result, the projected contribution of nuclear power in 2020 is slightly more than half of its 1995 level. While the base cases are similar, the two models differ substantially in the stabilization case. In the DRI energy model stabilization case, nuclear generation follows the DRI base case path. However, in the NEMS case, re-licensing of nuclear plants becomes economically attractive, and premature economic retirements do not occur. As a result, nuclear generation EIAs not fall from its 1995 level. In addition, the model suggests that new nuclear capacity could be added in the 2015 time frame given the modeled carbon permit values in the stabilization case.

It should be noted that the model does not account for issues of public acceptability and uncertainty regarding waste disposal that could present significant barriers to new nuclear investments. The anticipated shift to more competitive electricity markets, in which the cost of capital for new generation facilities will be higher than that applicable to regulated utilities, tends to make investment in capital-intensive technologies with long lead times, such as nuclear generation, less attractive. For these reasons, the prospects for new nuclear builds remain problematic. The models illustrate how different policy choices can lead to differing outcomes.

Natural Gas

Contribution to Greenhouse Gas Emissions

Of the fossil fuels, natural gas consumption and emissions are predicted to increase most rapidly through 2015, according to AEO 97. In 1995, carbon emissions from natural gas were 267 MMTC, and this figure is projected to increase to 310 MMTC in 2010 and 319 MMTC in 2015.

Factors Shaping Industry Response

Impacts of greenhouse gas emissions mitigation on the natural gas industry depend on the balance between the three available strategies in reaching the emissions reduction goal. Different modeling tools illustrate different possible futures:

- The DRI energy model shows a reduction in natural gas use relative to baseline on the order of 9 to 16 percent between 2005 and 2015.
- NEMS, despite simulating a somewhat larger reduction in carbon emissions from the energy sector, shows an increase in natural gas use relative to base of between 4 and 11 percent over this same period.

The dramatically different alternative futures illustrate the way in which emphasizing different energy strategies to reduce carbon emissions — energy efficiency versus fuel switching — will produce different results.

The key to cost-effective greenhouse gas reductions in 2010 lies in the large potential of developing and implementing energy efficiency technologies in each of the economic sectors. Within the industries which may be required to reduce their greenhouse gas emissions, there will be opportunities to gain competitive advantage through creatively meeting the environmental challenge. There will be opportunities for other industries as well. For example, companies and individuals in the architectural field can benefit as new building designs are needed to improve efficiency in both the residential and commercial sectors. In addition, industries that manufacture items such as heating and air conditioning equipment, office equipment, automobile parts, industrial equipment, and lighting, to name only a small fraction of potential industries, may also benefit under a climate change policy due to increased demand for these products. Finally, industries involved in the development of renewable energy technologies will also be at an advantage as interest in solar, wind and other sources of energy grows.

Conclusion

From the above discussion, it is clear that the way in which resources are used by individual industries within each economic sector varies widely. This is not surprising given the vast array of goods and services produced by these industries. Because sectors are unique, a climate change mitigation strategy must be designed and implemented in a way that reflects a solid understanding and appreciation of the differing circumstances faced by U.S. industries. This will give each industry the ability to respond to individual policies in a way that both minimizes potential impacts and maximizes possible opportunities. In order to achieve this goal, future climate change policies must be based on the continued development and diffusion of cost-effective, energy efficient technologies.



EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

Handwritten signature

MEMBER

June 9, 1997

MEMORANDUM FOR DAVID B. SANDALOW

FROM: ALICIA H. MUNNELL *AHM*
JEFFREY A. FRANKEL

SUBJECT: POTUS Memo on Climate Change

Thank you for the opportunity to comment on the decision memo before it goes to the principals for review. We are very concerned with the memo as drafted, and cannot sign off without some significant changes that will make it more useful for the President and Vice President. Our comments fall into four categories.

1. **The CEA position mischaracterized.** Because of the way the memo is constructed, the CEA position is described incorrectly in the current draft. CEA believes that Option 2 is an expensive option--more expensive than portrayed in the accompanying tables--and not consistent with an optimal path that maximizes the benefit-cost ratio as recommended by most economists. Nevertheless, we believe that global climate change is a potentially significant problem that can be solved only by the participation of both developed and developing countries. For this reason, we would be willing to go beyond what most economists recommend as an optimal path for efficient emission reduction if, and only if, we could secure (a) LDC commitment to "evolution," that is, eventual accession to emission limits similar to the Annex I countries; and (b) a flexible international trading system. We would like this reasoning spelled out in the discussion of Option 2 in the memo.

Second, our view of unilateral action should be stated as follows:

"If no agreement is reached in Kyoto, the CEA believes that the U.S. should consider taking smaller unilateral actions to show good faith internationally, to start educating the American people, and to begin creating the incentives for energy-efficient investments."

2. **Economic impacts of emission restraints understated.** The tables presented in Appendix C show the most optimistic plausible outcomes from the alternative emission restraints. As such, they should be included. But to give a fairer sense of the possible economic impacts, the memo should also include a second set of tables that assume (1) a lower rate of autonomous

technological change (as suggested by the majority of the outside reviewers); and (2) a less optimal recycling of the domestic permit revenue such as reducing the personal income tax. In addition, all tables should include the decline in consumption as well as the decline in GDP.

3. Option 3 not well-developed. If the President and Vice President do not want to sign on to a program with the enormous economic and political implications of Option 2, they need to have a viable alternative. As presented, Option 3 does not satisfy that criteria. Characterizing Option 3 as calling for “emission levels peaking at 2010, returning to 1990 levels in the longer term, and declining thereafter” would be more consistent with the international agenda. It would also be useful to spell out the benefits of such a proposal--namely, that its provisions are more likely to be adopted than those of the more ambitious plan, and that phasing in new energy efficient capital as old capital wears out is far more efficient than the more rapid option..

4. The pros and cons of the options are not clearly spelled out. Each option should have a list of the three or four strongest arguments for and against. These should be more substantive than “take the high ground,” or “would equate your performance...with George Bush’s....” For example, suggested pros and cons for Option 2 would be as follows:

Pros

- Would allow the United States to show leadership on global climate change.
- Would increase the likelihood of reaching agreement at Kyoto.
- — If adopted, would produce substantial collateral benefits such as reductions in ozone and PM.
- Coupled with demands for developing country participation and flexibility, provides a principled way of negotiating internationally.

Cons

- Would dramatically alter the Nation’s fiscal structure, raising \$100-\$200 billion per year if emission permits were auctioned.
- Would raise the price of gasoline by as much as 40 cents per gallon; would as much as quadruple the price of coal from \$28/ton to \$113/ ton.
- Would reduce GDP by as much as 0.6 percent in 2010, and reduce consumption by as much as 1.0 percent.
- Would have enormous regional and industry impacts.

Finally, we have attached some detailed editorial comments.

As we said at the beginning, we view the four points discussed above as being so serious that they preclude sending the memo even to the principals until the issues have been addressed.

ISSUE FOR DECISION

In your trips to the Denver Summit of the Eight (June 20-22) and UN General Assembly Special Session on Environment and Development (June 26), what should you say concerning the U.S. position on emissions levels under the climate treaty?

NEED FOR DECISION

To date, the U.S. has not supported any specific emissions levels under the climate treaty. Other countries and domestic constituencies are calling on us to state our views. At the Denver Summit of the Eight, Chancellor Kohl and others will press you on this issue. At the UNGA Special Session, media attention to this issue will be high. Both meetings offer excellent opportunities to advance and explain our position.

I. BACKGROUND

Climate change is an issue of vast scale. Decisions on the issue posed in this memorandum could have significant environmental, economic and political consequences.

The build-up of greenhouse gases in the atmosphere threatens fundamentally to alter the Earth's climate. Currently, greenhouse gas concentrations are at their highest level in more than 200,000 years. (See Appendix A). Absent policy interventions, concentrations by the end of the next century will reach the highest level in more than *50 million* years. Impacts are predicted to include sea level rise, the spread of infectious disease, more frequent and severe droughts and floods, loss of forest cover and shifts in agriculturally-productive regions. Absent policy interventions, global average temperatures by the end of the next century are projected to increase 2-6.5 degrees F., sea-level rise is projected to inundate more than 9000 square miles in the United States (with Florida and Louisiana most vulnerable) and an additional 50-80 million people are projected to contract malaria worldwide. According to a NOAA study, average July temperatures in Washington, D.C. by the end of the next century are expected to increase by 5-15 degrees F. (with greater humidity).

The cost of reducing greenhouse gas emissions is potentially substantial. The principal source of such emissions is the burning of fossil fuels, which powers the global economy. Meeting the emissions targets proposed by the European Union, for example, is projected to reduce U.S. GDP in 2005 by 0.1-1.0%, increase gasoline prices in 2010 by 20-25 cents per gallon and increase coal prices in 2010 by almost 180%. Without a well-functioning system of international emissions trading, these figures would roughly double. Private capital outflows associated with an international emissions trading regime are predicted to be roughly \$5 billion per year. Significantly, modeling indicates that economic losses from some policies are largely transitory: after an initial loss, the economy rebounds and catches up to its original growth path. Costs depend significantly on rates of technological innovation. Effects on some sectors of the economy will be much larger than effects on the economy as a whole.

This administration has been active on this issue since Earth Day 1993, at which time you pledged to return U.S. greenhouse gas emissions to 1990 levels by the year 2000, and then to continue the trend of reduced emissions. In October 1993, we issued the Climate Change Action Plan, made up of several dozen mostly voluntary programs, designed to meet that goal. (Due to Congressional budget cuts and other factors, the goal will be missed by a wide margin). U.S. negotiators have shaped the international climate change negotiations by calling for binding emissions targets, "flexibility" provisions (such as international emissions trading and joint implementation) that would significantly lower costs of meeting those targets, and the participation of developing countries. You have spoken to this issue several times in the past year, including in the 1997 State of the Union, where you called for "reduc[ing] the greenhouse gases that challenge our health even as they change our climate."

The politics of this issue are difficult, at best. For many environmental groups, strong action on climate change is a litmus test for your environmental policy. If you fail to speak

decisively on this issue in Denver (at the Summit) or New York (at the UNGA Special Session), their criticism will be intense. On the other hand, much of the business community is strongly opposed to action on climate change. Fossil fuel and heavy manufacturing companies are poised vigorously to attack any policies the environmental community might support. Labor is increasingly opposed to action on climate change, largely in deference to the concerns of the United Mine Workers. Southern and western Republicans on the Hill are very skeptical about this agenda, as are midwestern and coal state Democrats.

On June 4, the Los Angeles Times wrote "At two international summits this month, President Clinton will no doubt take some heat about U.S. sluggishness in combating global warming...The United States, which produces nearly one-quarter of all fossil fuel emissions and has an environmentally savvy administration, is the logical mediator of a compromise proposal."

II. OPTIONS

Earlier this week, we identified several options for principals concerning the U.S. position on emissions levels in the international climate change negotiations. Each option was defined in terms of a broad directional statement you might offer at the Denver Summit or UNGA Special Session.

The meeting produced a considerable convergence of views. Most agencies (State, Commerce, Transportation, Energy, Agriculture, EPA, AID, OSTP and CEA) supported an option in which you would call for "stabilizing emissions in the medium term and reducing thereafter." In the parlance of the climate change negotiations, this means stabilizing greenhouse gas emissions at 1990 levels by roughly 2010 and reducing to lower levels thereafter.

Several caveats are important:

First, many of these agencies conditioned their support on success in obtaining flexibility provisions (e.g., international emissions trading, joint implementation) and the participation of developing countries. These agencies generally believe that any statement you make concerning emissions levels should be coupled with a strong statement on the importance of these additional provisions. Some agencies believe we should not accept any agreement at Kyoto unless developing countries agree to negotiate quantitative emissions limits.

Second, the Treasury Department has significant concerns. ^{Treasury} ~~Larry Summers, in particular,~~ spoke forcefully about the economic and political costs of stabilization and urged a less ambitious approach. ~~Summers noted that~~ cost estimates are based on the assumption that underlying economic growth rates through 2010 will average just over 2%, and that costs of achieving any target would increase if these growth rates were higher. Treasury also focused on the potential wealth transfers possible under some control regimes, noting that

Not clear -

Overall economic impacts of this option could be significant (although GDP impacts could be transitory). Dislocation in some sectors and regions (especially coal states) could be large. Environmental benefits (both climate and non-climate) could be significant. Some environmental groups would be pleased; others would complain of lack of U.S. leadership. Most business and labor groups would be opposed, although some might

support if the policy were coupled with other features they find attractive. Without significant changes in the political landscape, the prospects for ratification by the Senate in the next several years would be poor.

Option 3: Call for "reducing emissions *growth* in the medium term, on the way to stabilization."

Start in terms of costs.

Comment: This is consistent with views of the Treasury Department. Economic costs would be relatively mild, as would opposition in the business and labor communities. Environmental benefits (both climate and non-climate) would be modest. Criticism from other countries and U.S. environmental groups would be very strong. Environmental groups would equate your performance in New York with George Bush's performance at the 1992 Rio Earth Summit.

With this option, there is no chance of obtaining international agreement on our "flexibility" or "developing country participation" proposals. Emphasizing the importance of these proposals in the context of this option would lead to especially scathing criticism. However, there is a chance an option along these lines would be ratified by the U.S. Senate in the next several years without major political changes.

Option 4: Call for "strong action on climate change" and "agreement in Kyoto." Say that the United States is continuing to study the issue of emissions levels and will elaborate on its position at a later time.

Comment: This roughly repeats prior statements by you and other administration officials. It would be strongly criticized by environmental groups, who (here too) would equate your performance in New York with George Bush's performance at the 1992 Rio Earth Summit.

This formulation would allow additional refinement of economic modeling runs before our position is announced. We are currently in the middle of peer review of this modeling. More time would produce additional validation of interagency modeling work, although we do not anticipate significant changes in the results.

• Material analyzing the environmental impacts of these options is attached as Appendix B. Material summarizing the projected economic impacts of Options 1, 2 and 3 is presented in Appendix C. Additional background material on climate change (including a discussion of domestic policy options) is attached as Appendix D.

Not correct. Reviewers have been very critical of our model and assumptions.

Add possibility of smaller unilateral actions to signal seriousness of intent.



EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

THE CHAIRMAN

June 27, 1997

MEMORANDUM FOR THE PRESIDENT

FROM: JANET L. YELLEN *Janet L. Yellen*
SUBJECT: The World Bank's "Green Top Ten"

Attached is the information you requested regarding the World Bank's "Green Top Ten."

Attachment

FOR IMMEDIATE RELEASE

The World Bank



News Release No. 97/1377 S

Contacts: Phil Hay (202) 473-1796
Clare Fleming (202) 473-2874
Kristyn Schrader (202) 458-2736

WORLD BANK OFFERS "GREEN TOP TEN" IN ADVANCE OF UN EARTH SUMMIT *Calls for renewed efforts to safeguard environment*

WASHINGTON, June 5, 1997—Today, on World Environment Day, the World Bank presents ten measures which, it believes, can exert real impact on improving and protecting the environment. The call comes as world leaders, including President Clinton, and other dignitaries such as World Bank President James D. Wolfensohn, prepare to attend a Special Session of the UN General Assembly on the Environment in New York later this month.

The Earth Summit+5, as the UN session is called, will assess how much progress has been made on environmental priorities such as global warming, depletion of tropical forests, air pollution, and water conservation, since the first Earth Summit was held in Rio de Janeiro in 1992.

The World Bank says that despite encouraging progress in some of these areas, for example, reducing lead in gasoline and cutting the use of ozone-depleting chemicals, the current state of the global environment remains cause for profound concern. It notes that carbon dioxide emissions in developing countries have jumped by nearly 25 per cent since Rio, that pollution continues to worsen in many world cities, with 1.3 billion people still affected by poisonous air, and that tropical plants and bird life continue to be lost at a rapid rate.

According to the **World Bank's Managing Director of Operations, Caio Koch-Weser**, the bank is deeply concerned about the lack of momentum since the Rio Summit. He says the time has come for greater global partnership between industrialized and developing countries, UN agencies, private business, universities, international banks, local communities, non-governmental organizations, and other groups to forge a more strategic approach for safeguarding the environment.

"As central to this approach," says Andrew Steer, Director of the Bank's Environment Department, "we are presenting a list of ten measures which could make a real difference to the environment in the long-term."

- Phase out Lead in Gasoline Within Five Years
- Move Toward More Aggressive Elimination of CFCs
- Build Global Carbon Markets to Reduce Climate Change
- Make Water an Economic Asset
- Make Cities More Livable

WORLD BANK "GREEN TOP TEN"

The
World
Bank



- **Phase out Lead in Gasoline Within Five Years**—The Bank calls for a global conversion from leaded to unleaded fuel to reduce air pollution and health problems associated with lead exposure. Phased-out so far in 18 countries, including Brazil, Canada, Thailand, and the United States, leaded gasoline is believed to be responsible for neurological damage and heart disease among children, especially in developing countries. The Bank says that countries could recover their costs of conversion 5 to 10 times over through reduced health care costs and economic savings. The United States, for example, saved more than \$10 for every \$1 invested in its conversion. The Bank would stand ready to assist governments in introducing policies and programs to assist in the complete phase-out of leaded fuel.
- **Move Toward More Aggressive Elimination of CFCs**—The Bank says helping Russia curtail its production and use of chlorofluorocarbons, or CFCs, could arrest further depletion of stratospheric ozone. With help from a \$60 million joint World Bank-Global Environment Facility initiative, the Russian Federation has now agreed to phase out CFCs by the year 2000—but needs modest financial support from the industrial countries. The Bank says this could be repeated in China, India, Korea, Venezuela, Brazil, and Mexico, the world's other significant CFC producers, if the international donor community can provide the necessary financial support.
- **Build Global Carbon Markets to Reduce Climate Change**—As an agency closely involved in putting the Climate Change Convention into practice, the World Bank is exploring innovative remedies for the growing problem of climate change. One promising avenue is the concept of building global markets for trading greenhouse gas emissions. In other words, a company in one country may meet the Convention's emission standards by investing in pollution reduction in another country. This mechanism could lower the costs of reducing global emissions, and promote more ambitious global climate policies. Recent pilot projects by countries such as Costa Rica should be widely supported. The Bank is also encouraging private companies to finance renewable energy development in countries such as Indonesia and India.
- **Make Water an Economic Asset**—Water has long been considered a special commodity and not a normal economic resource. Subsidies to households, farmers, and other users have been commonplace throughout the world. This approach has proved to be unfair since it is always the rich who benefit from these subsidies, while the poor often miss out. About 1 billion people still lack access to formal water supply services. In urban areas the poor, who mostly lack domestic running water, typically have to buy their water from vendors, paying 10 times more for a gallon of water than someone with a municipal water connection. Furthermore, subsidies mean that water is wasted. With water scarcity a fact of life in many developing countries, it is imperative that water be treated as a precious, economic, resource. This means that the price of water should reflect the actual costs involved in delivering water, that the private sector should play a greater role in financing and managing water systems, and that

that removing such barriers throughout the value chain will require active partnerships among private investors, NGOs, governments, financiers, and local communities. Toward this end, the Bank will be supporting such "Market Transformation Initiatives" in forestry, marine industries, and solar energy.

- **Be Consistent with Environmental and Social Assessment**—Techniques are currently available to ensure that environmental and social concerns feature prominently in policy and project design, yet these are inconsistently applied. The World Bank calls on international financial institutions (including export credit agencies) to harmonize their standards and apply them consistently. The Bank is currently actively strengthening its own practices and—in partnership with IUCN and other groups—has embarked on a major training and capacity-building program in Africa. Ensuring consistently high standards is especially important for potentially damaging investments in infrastructure and energy. The establishment of an independent “commission” on large dams, agreed upon last month at a meeting convened by the World Bank and IUCN, is an important effort to ratchet up performance in this sector.
- **Adopt Greener Accounting and Eliminate Harmful Subsidies**—Traditional measures of economic progress ignore the depletion of natural resources and the subsequent costs of environmental damage. The Bank has been in the vanguard of efforts to link economic and environment issues by expanding the measure of a country’s wealth to include natural resources—using a greener measure of wealth will improve both economic and environmental policy-making. The Bank calls for increasing the application of greener accounts that can serve as indicators of the economic benefits of reducing environmental damage and the costs of depletion. In addition, the World Bank, together with the Earth Council and other concerned agencies, urges the rapid phase-out of subsidies on natural resource consumption. The Bank estimates that subsidies on fossil fuels have dropped by 50 percent since 1992, but still stand at \$58 billion. The Earth Council has estimated that total subsidies still amount to \$800 billion, including \$45 billion on water, \$150 billion on transport, and \$2 billion on pesticides. These subsidies rarely benefit the poor and invariably harm the environment.

-###-

6-25-97

BUSINESS, CONSUMER, AND REGIONAL ROUNDUP

Expansion Continues in All Fed Regions But at a Slower Pace. The Federal Reserve's Beige Book on regional conditions reports that all 12 district economies continued to expand in May and early June. Labor markets tightened, with some districts reporting wage increases. Furthermore, although the prices for energy, some metals, and real estate rose, few districts reported upward pressure on final goods prices. Agricultural reports were largely favorable, with localized pockets of weakness caused by unseasonably cool weather. Manufacturing activity appeared to remain at high levels and was growing in many districts. Overall, demand for commercial loans was high during this period, but consumer lending activity was mixed. Consumer spending growth appears to have slowed since April, with retail and auto sales exhibiting particularly slow growth rates in several districts.

World Bank Presents "Green Top Ten." On World Environment Day, June 5, the World Bank released 10 suggestions for a healthier, greener planet. The first suggestion is to phase out lead from gasoline within the next 5 years—a procedure the Bank says could save 5 to 10 times the cost of conversion through reduced lead-related health care expenditures and other economic savings. The United States, for example, saved more than \$10 for every \$1 invested in its conversion, according to the Bank. Some of the other proposals include building global carbon markets to reduce climate change; making water an economic asset by removing subsidies so that the price of water reflects the actual cost of delivery; and addressing market failures that impede the adoption of sustainable practices in a wide variety of circumstances. The Bank also proposed adopting greener accounting and eliminating harmful subsidies on fossil fuels. The Bank is offering these recommendations in advance of the coming Earth Summit+5 as ones that could make a real difference to the environment in the long term.

get us there

Assisted Living Grows in Popularity. Assisted living facilities (ALFs) are residential care settings that provide an additional emphasis on autonomy and personalized living arrangements as an alternative to nursing homes. Falling somewhere between independent living and nursing home provided care, assisted living facilities generally attract single or widowed females who average 84 years in age and possess some need for assistance with mobility and/or continence. However, because these individuals may not require the services of a professional nurse, assisted living is generally less expensive than placement in a nursing home. *Fortune* magazine has identified assisted living as one of the top three potential growth industries for 1997. A recent GAO study reported that most oversight and regulation of AFL care is done by states. One concern is that the rapid increase in the number of assisted living facilities may outstrip many states' ability to monitor and regulate care.

IPCC Press Release -- June 26, 1997

CLIMATE CHANGE: IPCC CHAIR DENIES ATTACK ON VP GORE, ENVIRONMENTALISTS

TO: Distribution List

Date: 6/27/97

From: Rosina Bierbaum *RB*
OSTP
6-6077

DEPT/ AGENCY	NAME	VOICE #	FAX #	OFFICE LOCATION	NOTES
Climate Change Taskforce	Dirk Forrister	202-343-1093	202-343-1163	737 Jackson Place	
CEA	Jeff Frankel	395-5046	395-6947	OEOB rm. 315	
OMB	T.J. Glauthier	395-4561	395-4639	OEOB rm. 246	
NEC	Mark Mazur	395-5147	395-6809	OEOB rm. 318	
CEQ	Katie McGinty	456-6224	456-2710	OEOB rm. 360	
CEA	Alicia Munnell	395-5036	395-9658	OEOB rm. 314	✓
CEQ	David Sandalow	456-6543	456-2710	OEOB rm. 361-A	
CEA	Jae Shogren	395-5012	395-6853	OEOB rm. 328	
NEC	Dan Tarullo	456-5353	456-1605	OEOB rm. 231	
OMB	Bob Tucillo	395-5609	395-5836	NEOB rm. 8026	
CEQ	Wes Warren	456-5143	456-2710	OEOB rm. 357	
CEA	Janet Yellen	395-5042 or 395-5854 (assn't)	395-6958	OEOB rm. 314	

*****Please ignore previous copy of IPCC Press Release -- it was missing page 2 -- replace with this updated copy.

Thank you and sorry for any inconveniences this error may have caused.



Intergovernmental Panel on Climate Change



GENEVA, 26 JUNE 1997

FOR IMMEDIATE RELEASE

Climate Change: IPCC Chair Denies Attack on VP Gore, Environmentalists

The Chairman of the UN's scientific advisory body on climate change denies criticizing Clinton administration officials and many environmentalists who have commented that recent extreme weather events may be the result of rising global temperatures.

According to a story which appeared in Greenwire (Thursday 26 June, story #3), Professor Bert Bolin, chair of the World Meteorological Organization/United Nations Environment Programme Intergovernmental Panel on Climate Change (IPCC) for the last 9 years, is alleged to have refuted statements by US Vice President Al Gore that this year's floods in the Upper Midwest of the United States "are consistent" with the predicted effects of climate change. He is also alleged to have said that efforts to establish such a link by environmentalists "is why I do not trust the Greens," and that "man-made increases in temperature are so small as to be barely detectable."

In a statement made from his home in Stockholm, Sweden, and issued through the IPCC office in Geneva, Bolin, a well-respected meteorologist, criticized the account of a climate-change debate in which he is alleged to have made these remarks, as "inaccurate and misleading."

Bolin denied criticizing Vice President Gore. Bolin noted that the statement attributed to Gore that this year's floods in the Upper Midwest "are consistent" with the predicted effects of climate change is a scientifically accurate statement and "no cause for criticism." Bolin went on to explain that "observations show that some extreme events are becoming more intense (heavy rainfall events in some regions), some are becoming less intense (cold spells), while others show no statistically significant changes (hurricanes). While it cannot yet be concluded that these changes are caused by human-induced changes of climate, neither can this association be excluded."

Bolin also denied taking issue with Tim Wirth, Under-secretary of State for Global Affairs. Regarding the statement that scientific questions about climate change have been

resolved, Bolin observed that "considerably more research is required to fully clarify and interpret what is happening to climate, especially on a regional scale, and how changes will affect human societies over the years to come." He added that the large majority of governments at the Ministerial segment of the Second Meeting of the Conference of Parties to the UN Framework Convention on Climate Change (held in Geneva in June 1996), "while recognizing uncertainties, believe that we know enough to take some actions now," and that this position was supported by 2000 independent scientists in a letter to President Clinton several weeks ago.

"I do not mistrust the 'Greens'," stated Bolin, who went on to observe that neither does he "agree with everything they say, however, just as I do not agree with everything that might be said by representatives of the fossil fuel industry, for example." He noted that his role as Chairman of the IPCC "is not to trust or mistrust any of the participants in the climate-change debate" but to ensure that the IPCC scientific assessment process is "fair and unbiased" and open to all "with a scientifically-supportable viewpoint based in research."

On the question of whether observed changes in climate can be attributed to human activities such as burning fossil fuels, Bolin noted that "The global mean temperature has increased by 0.3-0.6 degrees C since the late 19th century, and about 0.3 degrees over the last 40 years." He recalled that in its last major statement on this topic, the IPCC noted that "our ability to quantify the human influence on global climate is currently limited because the expected signal is still emerging from the noise of natural variability and because there are uncertainties in key factors." Nonetheless, the IPCC concluded that "the balance of evidence suggests that there is a discernible human influence on global climate."

#

For further information, contact Dr. Narasimhan Sundararaman, Secretary of the IPCC, at +41 22 730 8288.

Professor Bolin's full statement follows:

Dr. Fred Singer of the University of Virginia has distributed a press release, in which he refers to remarks I made, when he early this month presented his views about the IPCC Second Assessment (SAR) in Stockholm. As Chairman of the IPCC, and on the basis of the assessment conducted by the IPCC, I criticized a number of his "findings" severely. His account of what happened at this meeting is inaccurate and misleading.

The six "latest findings" that he refers to in his press release have either been considered by the IPCC and refuted or have not been published in the open scientific literature so that they could be assessed for their validity. The view that man is not so important as to affect the climate (quotation attributed to Professor Wibjorn Karlen) is irrelevant, since no evidence is

presented that supports this view. Regarding Singer's self-congratulatory statement that the "discussion appeared to go decidedly against Dr. Bolin's IPCC position," I had rather the impression that Dr. Singer's views did not convince those present.

Singer misinterprets several of my statements:

I do not mistrust the "Greens". This is not to say that I agree with everything they say, however, just as I do not agree with everything that might be said by representatives of the fossil fuel industry, for example. My role as Chairman of the IPCC is not to trust or mistrust any of the participants in the climate-change debate, whether they belong to environmental groups, industry associations or individual scientists. My role is to ensure that the IPCC process is fair and unbiased, as far as possible, and open to all those with a scientifically-supportable viewpoint based in research.

The occurrence of extreme events requires careful analysis. The problem with Fred Singer's press release is that he is not as precise as he should be. There are different types of extreme events. In fact, the IPCC SAR, which Singer says provides an accurate account of the state of scientific knowledge, highlights some of these distinctions, see pp. 168-173 of Volume I of the SAR for a discussion of our present scientific knowledge about extreme events. Observations show that some extreme events are becoming more intense (heavy rainfall events in some regions), some are becoming less intense (cold spells), while others show no statistically significant changes (hurricanes). These changes are consistent with the kind of changes that would be associated with a warmer climate. While it cannot yet be concluded that these changes are caused by human-induced changes of climate, neither can this association be excluded. To state that these sorts of changes that 'are consistent' with the predicted effects of climate change, as Vice President Gore is quoted to have stated, is a scientifically accurate statement and no cause for criticism.

The key issue is of course, if a human induced change of climate can be detected. The global mean temperature has increased by 0.3-0.6 degrees C, since the late 19th century and about 0.3 degrees over the last 40 years. Is part of this change due to our emissions of greenhouse gases to the atmosphere? Climate varies naturally and the issue is if we can detect a human-induced change of climate in spite of the "noise" due to the natural variability. The IPCC concluded: "our ability to quantify the human influence on global climate is currently limited because the expected signal is still emerging from the noise of natural variability and because there are uncertainties in key factors. These include the magnitude and patterns of long term natural variability and the time-evolving patterns of forcing by, and response to, changes in concentrations of greenhouse gases and aerosols, and land surface changes. Nevertheless, the balance of evidence suggests that there is a discernible human influence on global climate." It should be noted that the inertia of the climate system and the counteracting effects of aerosols delay the appearance of a climate change, makes the issue more difficult to grasp, but does not diminish the possible seriousness of the issues.

Finally, I did not take issue with Tim Wirth, Under-secretary of State for Global Affairs in this debate. As Chairman of the IPCC, I have no reason to comment on the views of Mr. Wirth on this matter, nor did I do so at the meeting in Stockholm. Regarding the substance of the comment attributed to Mr. Wirth, namely that scientific questions about climate change have been resolved, considerably more research is required to fully clarify and interpret what is happening to climate, especially on a regional scale, and how changes will affect human societies over the years to come. It is also important to note that most governments at the Ministerial segment of the Second Meeting of the Conference of Parties to the UN Framework Convention on Climate Change (held in Geneva in June 1996) concluded that there is sufficient evidence to warrant reductions in emissions of carbon dioxide and other greenhouse gases, based on IPCC's Second Assessment Report. Therefore, the large majority of governments, while recognizing uncertainties, believe that we know enough to take some actions now. This position was supported by an independent group of 2000 scientists in a letter to President Clinton several weeks ago.

I find it most annoying that the account of the meeting in Stockholm has been presented in such a biased manner.

Bert Bolin (signed)

**OFFICE OF TIMOTHY E. WIRTH
UNDER SECRETARY
FOR GLOBAL AFFAIRS**

**DEPARTMENT OF STATE
2201 C Street, N.W.
Room 7250
Washington, D.C. 20520
Phone: 202-647-6240 Fax: 202-647-0753**

Copy
AM
JS
MM

Please deliver to: Interagency Climate Change Deputies Group
Jim Baker, Commerce/NOAA
Rosina Bierbaum, White House
Eileen Claussen, State
Dirk Forrister, CEQ
Jeffrey Frankel, CEA
John Garamendi, Interior
Jack Gibbons, White House
T.J. Glauthier, OMB
Sherri Goodman, Defense
Fred Hansen, EPA

Number of Pages (including cover): 6

Date: June 25, 1997

I am sending you my note to Secretary Daley and a copy of the speech he delivered on June 20 to the Greenhouse Gas Emissions Trading Policy Forum at the Union League Club.

TEW



UNDER SECRETARY OF STATE
FOR GLOBAL AFFAIRS
WASHINGTON, D.C. 20520-7250

June 21

Dear Bill,

Your Climate speech of June 20 was
first rate - thank you from us all. The
input + support of the Department of Commerce in
general, and your special understanding of the
need organizational + political agenda, is so
welcome.

With thanks again, and please let me
know whenever we can help.

With best wishes,

Vim



UNITED STATES DEPARTMENT OF **COMMERCE** **NEWS**

WASHINGTON, D.C. 20230

OFFICE
OF THE
SECRETARY

FOR IMMEDIATE RELEASE

Friday, June 20, 1997

CONTACT: Maria Cardona
202-482-4883

**Remarks by U.S. Secretary of Commerce William M. Daley
Greenhouse Gas Emissions Trading Policy Forum**

[As Prepared for Delivery]

Good afternoon. I am delighted to join you. It's a special pleasure to be here at the Union League Club. I have hanging over the fireplace in my office in Washington a portrait of Theodore Roosevelt -- the president who signed the bill creating the Commerce Department -- which the Club was kind enough to lend me.

Let me begin today by congratulating the United Nations Conference on Trade and Development and the Earth Council for launching this important environmental initiative. The move towards an international greenhouse gas emissions market, similar to the successful U.S. program for cost-effectively lowering acid rain, is both timely and appropriate. I also want to recognize Chicago executive, Dr. Richard Sandor, and the government of Costa Rica for their trail-blazing efforts in this regard.

The Clinton Administration is deeply committed to, in the President's words, giving our children a world worth living in. Last week in a meeting with U.S. business CEOs, President Clinton challenged the group to prove that an economy can grow, while not only preserving, but actually enhancing the environment. No one has been more out front on this issue than Vice President Gore, who is actively working with both government and industry to help our nation meet its economic and environment goals.

The President and Vice President -- all the members of this Administration -- strongly believe that environmental commitments can complement economic objectives. Through far-reaching dialogues, healthy debate, and public-private partnerships, we can find responsible, cost-effective ways to foster family and community friendly growth.

The Administration's Clean-Car Initiative, officially known as the Partnership for a New Generation of Vehicles, is a prime example of this approach. Working together, seven federal agencies, the "Big Three" auto makers, 20 national laboratories, and over 300 auto suppliers and universities are developing vehicles with three times the energy efficiency of today's automobiles -- with no sacrifice in cost, comfort or safety. I have met with the executives involved. The progress is real. Even those who were skeptical originally are now excited.

Public-private partnerships can work. And if ever an issue called out for a cooperative approach, it is climate change. This isn't about dotting the i's in a regulatory finding or making minute calculations that will affect a small handful of people. This is not a single industry problem. It is not single city problem. It is not a single country problem. It is a human problem that, unlike other environmental issues, affects every person, every business and every government in this world.

To solve it, to promote the best interests of our businesses and workers and generations to come, we need cooperation, not confrontation. This battle will be won by industry and government reasoning and working together.

So let me be clear at the start what my message is. We believe that the long-term threat of global climate change is real. We believe that we must take action now. We also believe that we can shape an agenda that allows us to preserve our environment and grow the economy. As Teddy Roosevelt said, "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value."

We can do this by working creatively and responsibly at home and with other nations to develop a climate change policy. The key questions that confront us at this moment are how and when to begin. Let me answer that second question first. Again I say, we must begin now. Not because of the danger of an imminent disaster. But studies do show that emissions are growing. If we are to avert a greater problem later, we need to act now.

What do we know about climate change? We know that carbon dioxide warms the planet and that by pumping more of it into the atmosphere, we are changing our climate. We know that we've had more extreme weather conditions in the United States in the last five years than we had in the previous 30. We know that rising emissions of greenhouse gases trap heat within the earth's atmosphere. We know that global average surface temperature has increased, and the last few years have been the warmest of the past century. We know that, despite the naysayers, the science is compelling: there is a discernible human influence on global climate. We know that while we cannot precisely predict what or where the effects of the climate changes taking place will be, the net effect is unlikely to be good -- and the shift in temperature may be abrupt and occur in ways that we may not predict. And, finally, we know deep in our hearts that we do not want to gamble with our children's future.

I have talked to the experts. From Commerce Department scientists who are among the world's leading researchers into the atmospheric phenomenon and effects surrounding climate change and its likely impacts -- and from the Intergovernmental Panel on Climate Change, comprised of the world's preeminent scientists -- the best scientific evidence indicates that global warming is occurring. And that it could have profound consequences for the economy and the quality of life for us -- and for future generations. The time to address this threat is now.

I have reviewed with the Commerce Department economists who managed an interagency climate change analysis their recommendations on responses to the impact of climate change.

Chief among these is a far-sighted technology program that targets emission control and reduction. We need to sit down with concerned industry leaders and find ways to accelerate the development and diffusion of innovations that achieve these goals. We need to start thinking big and "out of the box." The benefits would be multiple. Reduced emissions and a healthier environment foremost. And beyond this, well-designed processes reduce total business costs and drive economic growth.

By some estimates, up to half of U.S. economic growth since World War II has been fueled by advanced technologies. New energy and energy efficiency technologies, as well as wholesale new ways to make and use products and services, will create new markets and new opportunities for U.S. companies and businesses worldwide.

Also noteworthy is the recent study which shows that establishments that use advanced technologies are more productive, pay higher wages, offer more secure jobs and increase employment more rapidly than firms that do not.

The interagency analysis indicates that capital incentives are important to managing climate change. Investment triggers capital stock turnover and technology advances, the key to emission reduction. Technological innovation is the principal means for moving beyond the outdated tradeoff between jobs and the environment. Therefore, investment incentives must be considered as part of climate change strategy. We believe that pro-investment policy is pro-environment, pro-growth policy.

At the same time, we realize that though the economic costs of dealing with greenhouse gases are transitional and relatively small -- the equivalent of a 25 cent increase in the price of gasoline by some estimates -- these should include compensation for those workers adversely impacted.

The United States is committed to constructing a climate change strategy that is both responsible and reasonable -- a strategy that recognizes the near-term concerns of American workers and businesses -- and the long-term benefits to all of America and all of the world that a healthy environment brings. I will be working closely with the American business community to develop a plan that achieves our twin goals of promoting economic growth and preserving the environment.

I have one final and very important point. As this forum pointedly demonstrates, solving the climate change problem cannot be a sole source endeavor. The whole world must be involved. All nations -- developed and developing -- must participate. We cannot and will not agree to a international system that imposes constraints on developed countries, but leaves developing countries without obligations. We won't agree to such a system because it wouldn't work. It wouldn't solve the global challenge of reducing greenhouse gas emissions. And it would unfairly hurt U.S. business. This will be a key element of the U.S. proposal for any worldwide effort.

As British Petroleum CEO John Browne told a university group last month in a speech on climate change, "The cultures of politics, science and enterprise must work together if we are to match and master the challenges we all face. Our future is a common one. So too needs to be our resolve."

I want to again congratulate you for promoting this forum and putting together this important initiative. I look forward to working with all of you toward a healthy global environment.

Thank you.



Jason Shogren

06/23/97 11:40:57 AM



Record Type: Record

To: Jeffrey A. Frankel/CEA/EOP, Alicia H. Munnell/CEA/EOP, Janet L. Yellen/CEA/EOP

cc:

Subject: draft outline 2

Outline: An economic assessment of US global climate change policy

--draft--

23 June 97

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1

June 17, 1997

FAX MEMO

TO: Katie McGinty, David Sandalow at CEQ
Dan Tarullo, Mark Mazur at NEC

FROM: Dirk Forrister, Climate Change Task Force

RE: Attachment

Attached is the version of the document that was delivered to Todd Stern. It was shortened per Todd's comments, eliminating the "message" text.

Thanks.

cc: JY
JAT
J.S.
AM
JFK

Climate Change: The President Engages the American Public

Overall Goal: Show the American public that President Clinton is determined to combat climate change in a way that deserves broad support and benefits from the involvement of a broad range of participants.

Overall Strategy: A Three Pronged Approach

1. President's Vision Set Forth at UNGASS
2. Engage American Public in National Dialogue
3. Outreach to Policy Community

1. President's Remarks at UNGASS: Intensive Engagement to Chart Path Forward

Goal: Set President's vision for approaching climate change and begin national dialogue, drawing business, labor and environmentalists into a cooperative process on how best to move forward.

2. Engaging the American Public in a National Dialogue on Path Forward

Goal: Elevate public understanding of the importance of changing climate and build support for national policy priorities developed cooperatively through an open dialogue with the range of affected constituencies.

Strategy:

- **Presidential Events:**
 - 3 radio addresses by end of September (first possibly on June 28)
 - Message-of-the-day events; for example:
 - Kick-off of Million Solar Rooftops (Virginia PV plant or sites in SW/West Coast)
 - Visit Chicago's Board of Trade SO₂ Trading Center
 - Visit a GLOBE school site
 - Visit the Denver Clean Car Exhibit at G-8
 - Visit New York Harbor to highlight sea level rise issues
 - Visit National Park where fragile ecosystems are threatened.
- **Vice Presidential Events:**
 - Site visits to technology demonstration projects (e.g. biomass or wind demonstrations in Iowa or Minnesota)
 - Announce a New Clean Cities participant (Houston, Phoenix, New York City)
 - Partnership for Advanced Housing Technology (new development at Stapleton Airport in Denver or southern California/Florida in disaster vulnerable areas)
 - Visit a Federal facility participating in the Federal Energy Management Program

- **Regional and National Workshops:** Conduct three regional conferences leading to a White House Conference. Three to five cabinet members and senior White House staff would participate in each. Conferences conducted in roundtable format, chaired by senior Cabinet members. Each would begin with key presentations, followed by open dialogue. Open to press and encourage live C-Span coverage. Conduct press backgrounders before and after. Involve regional corporate CEO's, academics, environmental & labor leaders, governors, other state & local leaders, religious leaders and members of Congress. All conferences would be comprehensive, but each would have a special focus, tailored to region.

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3. Outreach to the Policy Community

Goal: Engage policy community (CEOs and Congress in particular) in design of policies that comprehensively address climate change mitigation and that garner their support.

Strategy:

- President and VP should each reserve 10 - 12 slots for climate orientation briefings and meetings with industry leaders between now and Labor Day. Cabinet members should be given key responsibilities for particular sectors/industries. Should schedule in close coordination with National Dialogue meetings. Also encourage Cabinet members to host at least one public meeting and make a major speech.
 - Examples for President: meeting with Nobel laureates, meeting with religious leaders, meet with Congressional leaders to stress environmental imperative.
 - Examples for Vice President: Dinner with Congressional leaders; Lead a Congressional visit with scientific leaders to the Smithsonian's climate change exhibit.
- **Industry Roundtables:** Series of CEO meetings with POTUS, VP, Cabinet members &

other senior staff. Offer our policy inclinations, get feedback and ask for their ideas on what's missing. Examples:

- Invite Norm Augustine, CEO of Lockheed Martin, to bring 10-15 CEOs of major environmental technology firms for meeting.
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- Invite 10-15 renewable energy CEOs for meeting.
- Disseminate broadly the results of the PCAST review. The Committee has been challenged to produce an energy strategy that will meet the "energy and environment needs of the next century" by October.
- We should still consider an open meeting with the Washington, D.C., policy community on peer-reviewed economic analysis and other information to be used in the regional conferences.

Notational Schedule:

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October:	PCAST strategy due

June 17, 1997

FAX MEMO

TO: Todd Stern, Staff Secretary
Katie McGinty, David Sandalow at CEQ
Dan Tarullo, Mark Mazur at NEC

FROM: Dirk Forrister, Climate Change Task Force

RE: Attachment

cc: JY
AW
JAF
SS
TJR

DF

At the direction of Shelley Fidler and David Sandalow, I have tried to incorporate comments to the attached in response to the morning meeting. OSTP sent several suggestions, which we incorporated as best we could in time available.

Obviously, it got longer. Now 5 pages. I am open to suggestions -- easiest way to shorten is to drop out "messages" and save for later.

Please advise.

Thanks,

Dirk at 343-1060
(Or fax changes to 343-1162)

Climate Change: The President Engages the American Public

Overall Goal: Show the American public that President Clinton is determined to combat climate change in a way that deserves broad support and benefits from the involvement of a broad range of participants.

Overall Strategy: A Three Pronged Approach

1. President's Vision Set Forth at UNGASS
2. Engage American Public in National Dialogue
3. Outreach to Policy Community

1. President's Remarks at UNGASS: Intensive Engagement to Chart Path Forward

Goal: Set President's vision for approaching climate change and begin national dialogue, drawing business, labor and environmentalists into a cooperative process on how best to move forward.

Message:

- America has played an important role in this century for a peaceful and prosperous world. There are new challenges on the horizon. As America prepares to enter the 21st century, we are committed to improving our public education, advancing free trade, and beginning the transformation to a more sustainable environment.
- Climate change is our most important global environmental challenge as we approach the 21st century. The science is firm; the early evidence is consistent. Risks of inaction are high and unacceptable: increased storms, droughts and heat waves; increased sea level rise; more spread of infectious disease; problematic agricultural shifts; loss of forests and ecosystems. Costs of action are low and manageable, provided that policies are flexible and market based and that technology is deployed. Waiting isn't the answer because it makes the job harder to solve.
- I know the economy and how to create jobs. I am going to promote America's economic future and enhance the prospects for American workers. And I am going to find a way to address climate change effectively. We can do both.
- The path forward is clear: we need an effective international policy to control emissions. We're committed to maximum flexibility for businesses so we can achieve the greatest environmental benefits at the lowest cost. We need a commitment to act but act thoughtfully and a recognition that this is a global issue to be addressed globally. We need policies that send strong signals to the market spurring investment and innovation in technologies that reduce greenhouse gas emissions.

- I need the business community to step forward to work with us to find solutions. We need honest dialogue and a common vision. We need pragmatic steps now and ambitious goals for the future. We need to turn our technological prowess into an engine for change in abating greenhouse gas emissions. We can do this together, if we set our minds to it.
- Today, I'm asking every American to consider being part of this solution. Over the coming weeks, I'm asking the Vice President and my cabinet to engage in a new dialogue with the American public to find a common vision on the policy solutions required. I want them to report back to me at a White House Conference in early September with their findings on how best to move forward.
- I know that with the strength of the American spirit, the ingenuity of industry and the dedication to our children, we will meet this new challenge.

2. Engaging the American Public in a National Dialogue on Path Forward

Goal: Elevate public understanding of the importance of changing climate and build support for national policy priorities developed cooperatively through an open dialogue with the range of affected constituencies.

Message: We're serious about addressing climate change problems. We can meet the challenge better by working together than apart. We want to share what we have learned about climate science, economic impacts and opportunities, and possible policy alternatives. We want to listen to your views and incorporate them into our decision making. With concrete proposals, business can play a critical role in our decision making. We want to draw together America's best scientists, economists, and industry leaders to chart a path forward. And we want to go united into the world community with a vision of where all of America believes we should go on this critical issue.

Strategy:

- **Presidential Events:**
 - 3 radio addresses by end of September (first possibly on June 28)
 - Message-of-the-day events; for example:
 - Kick-off of Million Solar Rooftops (Virginia PV plant or sites in SW/West Coast)
 - Visit Chicago's Board of Trade SO₂ Trading Center
 - Visit a GLOBE school site
 - Visit the Denver Clean Car Exhibit at G-8
 - Visit New York Harbor to highlight sea level rise issues
 - Visit National Park where fragile ecosystems are threatened.
- **Vice Presidential Events:**
 - Site visits to technology demonstration projects (e.g. biomass or wind

demonstrations in Iowa or Minnesota)

- Announce a New Clean Cities participant (Houston, Phoenix, New York City)
- Partnership for Advanced Housing Technology (new development at Stapleton Airport in Denver or southern California/Florida in disaster vulnerable areas)
- Visit a Federal facility participating in the Federal Energy Management Program

- **Regional and National Workshops:** Conduct three regional conferences leading to a White House Conference. Three to five cabinet members and senior White House staff would participate in each. (Include mix of Albright, Rubin, Daley, Browner, Peña, Glickman, Babbitt, Shalala, Richardson, Witt, McGinty, Sperling, Tarullo, Gibbons, Yellin, etc.). Conferences conducted in roundtable format, chaired by senior Cabinet members. Each would begin with key presentations, followed by open dialogue. Open to press and encourage live C-Span coverage. Conduct press backgrounders before and after. Involve regional corporate CEO's, academics, environmental & labor leaders, governors, other state & local leaders, religious leaders and members of Congress. All conferences would be comprehensive, but each would have a special focus, tailored to region.

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Message: We need your help. Work with us, and we will jointly develop solutions that will work effectively and mitigate negative economic impacts to your business.

Strategy:

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meetings with industry leaders between now and Labor Day. Cabinet members should be given key responsibilities for particular sectors/industries. Should schedule in close coordination with National Dialogue meetings. Also encourage Cabinet members to host at least one public meeting and make a major speech.

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Additional Points:

Resources:

- In order to implement the strategy effectively, we need to significantly upgrade our

outreach effort. It will take significant financial and staff resources to conduct preparations and carry out events and follow up. White House communications and advance personnel could contribute expertise in planning this education drive. In addition, principals would need to make time available for preparation, speeches, roundtables, etc.

- Up to \$2 million (rough estimate) would be required for the regional and White House conference. We will need to designate a central coordinating facility to augment the White House Climate Change Task Force on this project.

Orientation: In order to jump start the process, it will be necessary to have a half-day orientation session for principals, perhaps at the Vice President's residence or the Blair House. This would cover science, economics, technology, and policy options. This would happen in early July.

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OFFICE OF TIMOTHY E. WIRTH
UNDER SECRETARY
FOR GLOBAL AFFAIRS

DEPARTMENT OF STATE
2201 C Street, N.W.
Room 7250
Washington, D.C. 20520
Phone: 202-647-6240 Fax: 202-647-0753

Please deliver to: Jim Baker, Commerce/NOAA
Rosina Bierbaum, White House
Dirk Forrister, CEQ
Jeffrey Frankel, CEA
John Garamendi, Interior
Jack Gibbons, White House
T.J. Glauthier, OMB
Sherri Goodman, Defense
Fred Hansen, EPA

Number of Pages (including cover): 15

Date: June 20, 1997

I thought you would be interested in the following testimony on climate change, which I delivered yesterday to the Senate Committee on Foreign Relations.

TEW

Testimony of Timothy E. Wirth
Under Secretary for Global Affairs
Department of State
Before the Subcommittee on International
Economic Policy, Export and Trade Promotion
of the Senate Committee on Foreign Relations

June 19, 1997

Good morning, Mr. Chairman. I am pleased to join you this morning to discuss the importance of climate change and to outline the United States negotiating position as we move toward December's multi-national conference in Kyoto.

Climate change is probably the most important environmental challenge facing the world. The ecological, human, economic and political consequences are of enormous importance for the mid-term and for the long-term – and each of us needs to understand them. We look forward to active and frequent consultations with this Committee and with the other members of Congress as we seek to reach an agreement and as we set up the needed long-term process.

The Science

I want to begin with the science – because scientists were the ones who drew our attention to climate change in the first place, and because we continue to base our policies on the best evidence and the most rigorous scientific analysis available.

Let me highlight some of the key scientific issues on which there is a global consensus:

- human activities have significantly increased the atmospheric concentrations of greenhouse gases over the last century.

- global average temperatures have already increased by about one half to one degree Fahrenheit.
- the balance of evidence suggests a discernible human influence on global climate.
- projections of the future change, based on complex climate models and on our best understanding of the physics of the climate system, suggest an increase of another 2 to 6 ½ degrees Fahrenheit by 2100, with an average greater than any seen in the last 10,000 years.
- Sea levels are projected to rise an additional 1 ½ feet by 2100, from expansion of the oceans due to global warming, and from a melting of glaciers and ice sheets.
- Climate change is likely to have wide-ranging and mostly adverse effects on human health, with direct and indirect effects leading to increased mortality.
- Coastal populations and infrastructure are vulnerable: a 20 inch rise in sea levels would put about 100 million people at risk each year from storm surges, with significant costs.

- Natural and managed ecosystems are at risk as ideal ranges shift with the climate. The location of forest and agricultural zones will change significantly.
- Future unexpected changes in the climate are not included in the models. These surprises may have impacts of global magnitude such as fundamental changes in global ocean circulation or ecosystem behavior.

These are the conclusions of the Intergovernmental Panel on Climate Change -- an international body of more than 2500 scientists, expert in all aspects of climate change, including the physical sciences, the social sciences and the economics. U.S. government experts have endorsed their work, as have the academic communities in the United States and around the world.

An excellent summary of the science and the impacts that could occur as a result of global climatic disruption was presented yesterday on behalf of nearly 2500 leading American scientists and I would like to include their statement for the record.

We do not yet have all the answers with respect to the science. We cannot yet say with certainty what the local effects of climate change will be. But, with better scientific data, the picture is becoming clearer.

For instance, in the United States, twenty inches of sea level rise would inundate 9,000 square miles of U.S. coastal land, with great loss of property and infrastructure. Rising temperatures could double the number of heat-related deaths. We now know that the ten warmest years since records began all occurred since 1980. Some of the most recent data shows that four of the five hottest years have occurred since 1990. With CO2 concentrations doubled in the atmosphere, heat waves like the one that killed around 500 people in Chicago two summers ago would be four to six times as likely to occur.

While we acknowledge uncertainties about where, how fast and when climate change will occur, and while we continue to press for research that will help us to answer these important questions, the basic fact remains that we are having a discernible impact on our climate.

Our policy is based on the current scientific consensus and on the need to achieve the most cost-effective emissions reductions possible. Our policy has three simple and straightforward objectives which are outlined in detail in a framework proposal we submitted to the climate convention in January. The proposal was shared with this Committee and was distributed widely with the public. The three objectives are as follows:

1. We are seeking to establish a legally binding emissions target for developed countries which is verifiable, credible and realistic.

2. We are seeking an agreement in Kyoto that maximizes the flexibility for each country to meet this legally binding target, including through the use of market mechanisms.
3. Third, we recognize the importance of involving all countries in the agreement – and to this end we have incorporated extensive language into our proposal that calls for developing countries to act.

Let me go through each of these in greater detail.

The Target: It is clear that the Framework Convention on Climate Change has not proven adequate to the task of reducing global emissions. We anticipate that only two countries will meet the Convention's non-binding aim of lowering emissions to 1990 levels by the year 2000. We ourselves will miss the aim by about 10%.

We believe a binding legal obligation to act will result in the passage of domestic laws – in all countries – that compel action. In order to build in some flexibility, our proposal calls for the targets to be multi-year in nature. Without this sort of legal obligation, countries will continue to pay only lip-service to their efforts to solve this problem. The past shows this is not enough.

Flexibility: Solving the problem of climate change is a long-term proposition that will require enormous effort over a sustained period. It is therefore vital that we achieve emissions reductions as cost-effectively as possible. Our approach to climate change seeks to do this. We have recommended that each country be given the maximum flexibility to meet its legal obligation. And we have rejected common, harmonized policies and measures recommended by some countries. We have also learned from the successes of the past, and are, wherever possible focusing our efforts on the use of market mechanisms to reduce costs.

One of the most innovative of these is the introduction of "emissions trading" into the lexicon of international agreements. The concept has been successfully used to reduce costs (as much as tenfold) in meeting the standards set for power plant emissions of sulfur dioxide. A similar program has also been successfully implemented in the Montreal Protocol on Substances that Deplete the Ozone Layer. In the climate context, we envision that Parties would be allowed to trade their emissions – seeking to reduce them where it is most cost-effective to do so. While we are still engaged in working through some of the details of how to implement this proposal, it is clear that such a program could significantly reduce the costs; some studies suggest by up to one-half.

Another piece of our strategy on flexibility is joint implementation. Through joint implementation, countries are allowed to undertake emissions reductions

projects in developing countries and count these reductions against their own emissions. We believe that joint implementation holds enormous potential to reduce global greenhouse gas emissions in a cost-effective manner. Joint implementation would also produce other benefits such as encouraging technological innovation, promoting the use of cutting-edge U.S. energy technologies, and protecting forests and other critical habitat around the world.

The U.S. has extensive experience with successful joint implementation projects. Recently, our approach on joint implementation received a major boost when President Clinton received the endorsement of the Dominican Republic and the seven Central American nations to endorse our concept of joint implementation for credit. This is a good example of our commitment to pushing through flexible mechanisms to implement new commitments under the Climate Change Protocol.

Developing Countries: We recognize the importance of including developing countries in this agreement. Their participation is critical to achieving any kind of a lasting success in combating the threat of climate change. For that reason, the participation of developing countries has been a central piece of our own negotiating strategy. We must seek a level playing field in which all countries that contribute to the problem contribute to its solution.

Developed countries, including the former Soviet Union and the countries of Eastern Europe, contribute about 60% of global emissions today, and developing countries account for about 40%. What do these numbers tell us? First, that the developed countries have historically contributed the greatest amount to the current heightened concentrations; we have fouled the nest. But the developing countries are rapidly growing, as are their emissions. The United States, with 5% of the world's population, is the largest greenhouse gas emitter, with more than 20% of the world's emissions. But China is not far behind, and is expected to pass us sometime in the first quarter of the 21st Century, although on a per capita basis, its emissions are projected to be less than one fifth of our own even then.

There is a clear concern about the potential impacts on our international competitiveness. Let me assure you that developing countries are part of our negotiating strategy and they must join us in order to insure that no country suffers significant competitive disadvantage.

We are all in this together, with different histories but with the same future. We pull a heavier oar at the beginning; over time, we all must pull together. Our policy has to be calibrated to reflect this reality. We cannot expect to solve the global problem unless all countries -- developed and developing -- participate in the solution. To this end, we have proposed three separate elements for developing countries in our proposal for Kyoto:

1. We call on developing countries to continue to elaborate on their commitments in the Convention – including by providing information on emissions on an annual basis (the same as for developed countries), and by taking “no regrets measures” (actions which may be valuable in their own right, and which also mitigate climate change). We also call for a regular review of the actions developing countries are taking (again, using a review process similar to that established to assess our own actions).
2. We call on the newly developed countries (such as Mexico and Korea) to take on binding legal obligations to reduce emissions, recognizing that while the targets they adopt may not be the same as our own, such commitments will codify their new status, and differentiate them from the lesser developed countries. We are now working with potential members of this group to seek their agreement on such a step. While by no means an easy task, we believe that in Kyoto, we can find some language to insure that countries in this category will take on commitments that correspond to their more developed status.
3. We call for the negotiation of a new legal instrument which will include legally binding obligations for all countries – including all developing countries – as a next step in the path toward the ultimate stabilization of greenhouse gas concentrations in the atmosphere at a level that is not

dangerous. This step, too, faces significant difficulty in the negotiations leading toward Kyoto.

Finally, I want to take this opportunity to note that one of the most important potential incentives with regard to additional developing country participation-- the Global Environmental Facility -- would be seriously undermined if Congress does not fully fund the U.S. contribution to this program. I hope you will support our request of \$100 million for the GEF for this year.

Let me close this morning by briefly reviewing for you the negotiating process between now and December 1 -- when we meet in Kyoto for the third session of the Conference of the Parties to the Convention.

We have two more one-week officials-level negotiating sessions -- the first in late July in Bonn, and the second in late October, also in Germany. During these two weeks we will be examining and negotiating the extensive text, which is a compilation of all the material submitted by all countries. This is an extremely divergent and broad document reflecting many interests around the world and it must be moved toward some consensus.

At one end of the spectrum, reflecting their strong commitment to making an aggressive statement, the European Union has proposed that developed countries reduce emissions by 15 % below 1990 levels by the year 2010. The

Organization of Small Island States has proposed a 20% reduction by the year 2005.

At the other end, reflecting their concerns with the potential impacts of various emission reduction proposals (particularly on reductions in the consumption of fossil fuel), OPEC countries have introduced a proposal that they be compensated for any economic cost they might incur as a result of treaty requirements.

Other countries have introduced recommendations that they be allocated an individualized, different target. This commitment to so-called "differentiation" is not yet defined, but is used by many countries as a first step toward finding their own way of joining the negotiating process.

As we examine these proposals, and develop our own negotiation strategy, we will continue to be guided by our own principles of feasibility and economic opportunity. We are, as you know, doing extensive economic modeling, and we have not yet completed the process. We expect the modeling will soon be completed and available to all interested parties.

I think it is useful as we think about the economic impacts of reducing greenhouse gas emissions that we remember over 2,300 economists, including eight Nobel Laureates, have endorsed a statement which in part states:

"... As economists, we believe that global climate change carries with it significant environmental, economic, social, and geopolitical risks, and that preventive steps are justified...For the United States in particular, sound economic analysis shows that there are policy options that would slow climate change without harming American living standards, and these measures may in fact improve U.S. productivity in the longer run."

I would ask that the economists' statement also be included in the record.

Finally, I should note that we understand that Kyoto is but one more step on the long road toward stabilizing the atmospheric concentrations of carbon and other greenhouse forcing gases. The long-term goal is stabilization of concentrations of greenhouse gases in the atmosphere at an acceptable level. This is a task that must begin now but which will require a sustained effort over the next decades.

Kyoto is a first step, but a very important one. The message that we send, by what we do, is enormously important. We believe we can succeed by:

- developing new technologies, and thus improving the way we fuel our economy, transport ourselves, and process materials
- using flexible economic instruments and market mechanisms

-- bringing in developing countries as full partners

-- fulfilling the obligations of our leadership role

And throughout this process, we can continue to promote economic development and improve the standard of living for the American people, while we protect the environment.

It is important, in Kyoto, that we set up a system that will work -- one that will allow us to reduce our emissions at the lowest possible cost so that we can achieve the maximum protection of the environment. And it is also important that we send a clear signal to governments and industries so they can make significant investments in the new technologies that will be required if we are to achieve our ultimate goal. And finally, although those of us in the developed world must take the lead, everyone must participate in moving toward the solution.

I look forward to working closely with you and your colleagues on this most challenging and complex of environmental issues.

Thank you very much and I will be happy to answer any questions you may have.