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Memo for Deputy GCC [Global Climate Change] May 1997

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THE WHITE HOUSE
WASHINGTON

May 7, 1997

MEMORANDUM FOR DISTRIBUTION

FROM: MARK MAZUR
DAVID SANDALOW

SUBJECT: Climate Change

There will be a meeting Thursday, May 8 from 4:00-6:00 in OEOb Rm. 476. We will discuss:

1. June public meeting
2. Deputies decision memo (copy attached).

Attendance is invitees only. Everyone on the attached list has been cleared into the building. For questions concerning clearance, please call James Uwins (456-6540).

Please note that Eileen Claussen is holding a climate change meeting Friday, May 9 from 2:00-4:00 in State Department Rm. 3524. The agenda for that meeting was distributed yesterday by the State Department.

(1) ΔE starts to slow (inflection)

~~(2) E/GDP peaks~~

P13 is policy

(3) E peaks

(4) E returns to 1990 levels

(5) E reduced below 1990 levels

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MEMORANDUM FOR THE DEPUTIES

FROM:

SUBJECT: Climate Change

International climate change negotiations are scheduled to conclude in December 1997. This memorandum describes the background of those negotiations and sets forth key issues for decision.

ISSUES FOR DECISION

1. What emissions budgets should the U.S. support in international climate change negotiations?
2. What domestic policies should the administration support to implement our obligations under the climate treaty?

NEED FOR DECISION

1. Emissions Budgets. Decisions are needed by June, in connection with the G-7 Summit (June 20-22) and UN General Assembly Special Session on Environment and Development (June 23-27). In addition, U.S. negotiators need guidance to allow them to generate support for our position in the months prior to the December meeting in Kyoto. Other countries and domestic constituencies are calling on the U.S. to state its views.
2. Domestic Policies. There is no immediate need for decision. However, the administration may wish to announce a set of domestic policies (and/or a process for developing them) in connection with a decision on emissions budgets.

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I. BACKGROUND

Climate change is an issue of vast scale. The problem and costs of addressing it are each, potentially, enormous.

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, more extreme weather events (such as droughts and floods), loss of forest cover and shifts in agriculturally-productive regions. During the next century, for example, the ideal range of forests is expected to move several hundred miles north, exceeding the ability of many forests to migrate. The international scientific assessment concluded 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, there is currently almost no ability to predict changes in 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), 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.

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The United States emits more greenhouse gases than any nation in the world, both in absolute terms (roughly 25% of the world's total) and per capita. (Our per capita emissions are roughly 50% greater than the OECD average and eight times that of China). In the United States, greenhouse gas emissions come mainly from utilities (about 1/3), transport (about 1/3) and buildings (about 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. That will require both technological change and additional negotiations during the next century.

C. 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 have done so. The Convention does not address steps 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 in the medium term (defined to include 2005, 2010 and 2020) by no later than 1997. Developing nations (who typically have less stringent obligations than developed nations in environmental treaties) agreed to "advance implementation of" their existing commitments under the Convention in this round of negotiations.

In July 1996, the US 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 some aspects of the US proposal was almost immediate, but support for other aspects has been quite limited. 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.

Views of other countries vary considerably. The European Union has proposed that

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developed nations cut back 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.

D. Constituency Views.

At present, public attention to climate change is low. Although polling data indicates that the public believes climate change is a serious problem (___ % in a 1996 poll), 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.

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 third -- composed of renewable energy and energy efficiency companies -- strongly supports aggressive climate change policies. Many businesses point to international competitiveness as a primary concern.

Agriculture groups are only beginning to pay attention to this issue. They have been concerned about both extreme weather and the possibility that climate change mitigation policies could lead to rising fuel costs or new regulatory burdens. The U.S. insurance industry is also beginning to pay attention -- although the European industry and U.S. reinsurers have voiced concern about climate change during the past several years.

Labor is increasingly opposed to action on climate change, largely in deference to the concerns of the United Mine Workers. An AFL-CIO resolution in [March], 1997 urged _____. Some unions -- including the UAW, the Steelworkers, the AFT and the NEA -- have taken considerably more moderate views in the past.

Finally, the religious community is increasingly engaged on this issue. _____ have

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collected more than 100,000 signatures in the past few months on a petition urging action on this issue.

E. 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, even more hostile to action on climate change than to environmental regulation in general. 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 most likely to support action on this issue.

"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.

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II. ISSUES FOR DECISION

This memorandum poses two broad issues for decision:

- A. What emissions budgets should the US support in international climate change negotiations?
- B. What domestic policies should the administration support to implement our obligations under the climate treaty?

Several agencies believe that the first issue is by far the most important and that it is important to emphasize this fact. In their view, the first issue raises broad questions of direction for the U.S. and its economy, while the second focuses more on narrow, programmatic details.

A. What emissions budgets should the US support in international climate change negotiations?

Decisions on this question are needed by June, in connection with the G-7 Summit (June 20-22) and UN General Assembly Special Session on Environment and Development (June 23-27). In addition, U.S. negotiators need guidance on this issue to allow them to generate support for our position in the months prior to the December meeting in Kyoto. Other countries and domestic constituencies are calling on the U.S. to state its views.

1. Background

In climate change negotiations, the term "emissions budget" refers to the amount of greenhouse gases that may be emitted over a certain period of time. The term is roughly synonymous with "target and timetable" (though an "emissions budget" connotes a longer time period than a "target").

To date, the United States has not supported any emissions budget for the post-2000 period. Our statements with respect to emissions budgets have been limited to the following: (1) this round of negotiations should address emissions in the medium-term, e.g. 2006-2020; (2) the base year for emissions budgets should be 1990, and (3) emissions budgets should consist of multi-year periods (i.e., the target should not be a single year).

A *threshold question* is whether the United States should find a way to avoid an agreement on an emissions budget in Kyoto. That question is not addressed in detail in this memorandum. Although no agency has voiced support for avoiding an agreement, some agencies believe this question should be identified to principals in light of the large potential costs of even the least stringent emissions control options. The advantage of avoiding an agreement would presumably

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include avoiding such costs; disadvantages would include a lack of progress in addressing the climate change problem and criticism from those who would charge the administration with backtracking on this issue.

2. Options

This memorandum considers three options for emissions budgets:

OPTION 1 - 90% by 2010 and reduce thereafter: Reduce greenhouse gas emissions to 90% of 1990 levels by a multi-year period around 2010 and to lower levels thereafter. (This is similar to the EU proposal).

OPTION 2 - Stabilize by 2010 and reduce thereafter: Reduce greenhouse gas emissions to 1990 levels by a multi-year period around 2010 and to lower levels thereafter.

OPTION 3 - 110% by 2010 and stabilize by 2020: Reduce greenhouse gas emissions to 110% of 1990 levels by a multi-year period around 2010 and to 1990 levels by a multi-year period around 2020.

A variation on any of the foregoing would include an "early emissions budget," in the period around 2005, less stringent than the levels described above. This would require a change in the U.S. position, but could possibly be structured to win support from domestic constituencies and other countries in the negotiations. Several agencies support such an approach.

The availability of various flexibilities (international emissions trading, joint implementation, banking and borrowing) fundamentally affects the emissions budgets the US would be willing to support. The more such provisions are included in the agreement, the less costly it will be for the US to meet any given emissions budget. However, if the entire US obligation can be satisfied by purchasing low-cost emissions reductions from abroad, the agreement will not provide large incentives for US industry to develop the technologies needed to address the climate change problem over the long-term.

Tactical issues concerning the public formulation of the US position are not addressed in this memorandum.

3. Analysis of different options

The discussion below analyzes the three options based on environmental impacts, economic impacts, domestic political implications, and implications for the international negotiations.

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a. Environmental impacts.

In terms of additional loadings of greenhouse gases into the atmosphere, the difference between the first three options in the short-term is small. Under Option 1 (the most stringent), greenhouse gas concentrations in the atmosphere would likely be ____ ppm by 2015; under Option 3 (the least stringent), concentrations would likely be ____ ppm. This alone does not equate to significant environmental impacts.

However, the options may produce different environmental impacts when considered as part of a longer, multi-decade path of reduced greenhouse gas emissions. 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) (a level higher than any seen on this planet for 50 million years), 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.

Institutional and political factors also lead to important differences between these options. Some agencies believe that few businesses will take Option 3 seriously, because the budget period is too distant. Some agencies believe that few businesses will take Option 1 seriously, since the economic costs would be too great, and that most businesses would simply work to block implementation rather than restructure activities to comply. All agencies agree that developing countries, who will represent the bulk of emissions growth in the decades ahead, will only take serious actions to address emissions after the developed world has done so. This tends to argue for early, serious action, to leverage reductions in the developing world.

Any of these options could have considerable environmental benefits unrelated to climate change. Strategies for reducing greenhouse gas emissions may also reduce emissions of NOX, SOX, carbon monoxide, PM 2.5 and other air pollutants. These benefits would likely be greatest with Option 1 and smallest with Option 3.

b. Economic impacts

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

Economic models are by nature imprecise. Their 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

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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 a "cap and trade" system, where a limited number of greenhouse gas emissions permits are sold at auction and anyone who emits greenhouse gases must have a permit.
- All revenues raised through the auction process go to reduce the Federal budget deficit.
- There are no transaction costs nor compliance problems with the domestic emissions trading system.
- The Federal Reserve undertakes relatively favorable monetary policy 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.
- Countries implement their policies in isolation, without an international trading regime that could permit countries with high-costs of emissions reduction to purchase emissions allowances from countries with lower abatement costs.
- 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.

These "base case" assumptions are not ideal for informing policymakers, for several reasons. Perhaps most significantly, the assumption that there will be no international emissions trading is inconsistent with U.S. policy. Such trading can significantly reduce aggregate economic costs (on the order of 50%), by the U.S. buying relatively low-cost emissions reductions abroad. To ensure results are not misinterpreted, this fact is highlighted in the text below. In addition, the base case masks sharp disagreement among agencies over likely rates of technological innovation and diffusion. These differences can affect aggregate economic costs by as much as a third in either direction.

2. Results. Results are presented in tabular form in Appendix _____. Table 1 presents results from the base case; other tables present results for other sets of assumptions (such as a well-functioning international emissions trading regime, distributing domestic permits to current greenhouse gas emitters rather than auctioning, and a more optimistic path of technological progress). All figures are in 1995 dollars and are presented relative to a "no-policy" baseline.

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The effect of the international emissions constraints and the domestic emissions trading program is to raise energy prices. Stabilizing greenhouse gas emissions at 1990 levels in 2010 *without international trading* is estimated to raise gasoline and heating oil prices by xx cents per gallon and retail electricity prices by yy cents per kilowatt hour (about aa and bb percent, respectively) in the base case.

The losses in aggregate economic activity are significant, but largely transitory. Table 1 shows GDP loss *in the absence of international trading* peaking around 1 percent in 20xx. After this initial loss, the economy begins to rebound as the proceeds from permit auctions reduce the Federal budget deficit and 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 and may even obtain real gains, indicating that the emissions reduction program modeled is implicitly pro-investment.

Coal bears the brunt of the emissions reduction policies, because coal is the most greenhouse gas intensive fuel. *Without international trading*, overall energy consumption drops by zz percent and coal consumption falls by qq percent. In essence, the least costly way to garner significant emissions reductions is to replace coal in electricity generation and industrial uses.

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). Adding a well-functioning international market to the base case model reduces the estimated energy price increases by as much as tt percent, with parallel economic savings. With international emissions trading, the United States is estimated to pay \$XX billion per year to other developed countries (primarily the FSU) to purchase permits.

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 cc percent. Estimated economic costs of the base case policy would be correspondingly reduced.

The results presented here do not include environmental benefits associated with reduced energy use, such as improved health, less congestion, and reduced costs of meeting other environmental goals nor do they consider the benefits associated with an improved climate. These benefits could be substantial.

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c. Domestic political implications

None of the options above are stringent enough for most environmental groups. All are too stringent for some in the business and labor communities. Opposition to any agreement from coal interests will be intense.

That said, it is reasonable to speculate that Option 1 would be considered a reasonably strong position by many in the environmental community. Sierra Club would oppose, but many groups would likely be pleased. Most in industry -- including utilities, coal, oil, autos, chemicals, transport and agriculture -- would strongly oppose. Efficiency and renewables businesses would support, but even natural gas interests would probably be unhappy. Labor would strongly oppose.

Option 2 would likely split key constituencies, including environmental groups, business and labor. Though many environmentalists would consider this option weak, some (such as the Environmental Defense Fund) would likely defend an agreement at this level. Business groups would be split as well, with support possible from some utilities, chemical companies, natural gas interests, farm groups and others. Labor would be split, with support possible from Steelworkers and the Oil, Chemical and Atomic Workers. In all cases, support would depend on the details of domestic program design.

Option 3 would be opposed by all environmental groups. Much of industry might be willing to support, although coal and oil would remain opposed. Most labor groups would likely be relieved and not actively oppose, with the exception of the mineworkers.

d. International negotiating implications

Our ability to negotiate a successful agreement in Kyoto is dependent on the emissions budget we select. To date, the US has won limited support abroad for its proposals on flexibility and developing country participation. Our ability to garner international support for these proposals will require us to select an emissions budget that is viewed as credible.

To date, proposals on emissions budgets include: (1) a 20% cut from 1990 levels by 2005 (small island states), and (2) a 10-15% cut from 1990 levels by 2010 (the EU). There is an expectation that this round of negotiations will produce reductions from 1990 levels in the next several decades.

An emissions budget that does not include a reduction below 1990 levels by 2020 would not be taken seriously abroad. Most other countries in the negotiating process would view this as extremely weak. Accordingly, it is unlikely that Option 3 could be achieved in this round of negotiations. In the unlikely event that Option 3 could be achieved, it would be at the expense of

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other aspects of the U.S. position, including the developing country and flexibility provisions.

Of the three options, Option 1 would give us the greatest opportunity to negotiate both the flexibility and developing country provisions. Option 2, with stabilization in 2010 and a reduction around 2020, would also give us a good chance of success.

B. What domestic policies should the administration support to implement our obligations under the climate treaty?

There is no immediate need for a decision on this question. However, we may wish to announce a set of domestic policies (and/or a process for developing them) in connection with any announcement on emissions budgets.

Discussion is divided into three parts:

1. Should domestic emissions trading be a central part of our climate change policy?
2. Should the administration increase its support for technology programs to help address climate change?
3. Should transition assistance be a central part of our climate change policy?

With respect to the first and third questions, participants in the "Assistant Secretaries group" provide a consensus recommendation. With respect to the second question, several options are identified.

1. Should domestic emissions trading be a central part of our climate change policy?

A. Background. Under a domestic emissions trading program, 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

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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 auctioned, substantial revenues would be raised. (Reflow options include tax cuts, deficit reduction and support for transitional or technology programs). If given away, recipients would potentially receive a windfall.

Comprehensiveness. Controls could apply to some greenhouse gases or only a subset (e.g., CO₂). If a "sectoral" approach is used, the program could apply to a single sector, several sectors or all sectors of concern.

More background on emissions trading programs is set forth in Exhibit ____.

B. Recommendation. Participants in the "Assistant Secretaries group" agree that domestic emissions trading should be a central part of our climate change policy. Participants agree that important program design issues should be addressed in consultation with key constituencies. Such consultations could begin soon and continue through the summer and fall.

Option 1: Accept the recommendation.

Option 2: Do not accept the recommendation. Provide working groups with alternative direction.

2. Should the administration increase its support of technology programs to help address climate change?

A. Background. Over the long-term, the solution to the climate change problem depends on technological change. If technological change can be accelerated, the costs of addressing climate change can be reduced significantly.

A range of government programs might help accelerate technological change. Investments in basic research, support for commercialization, information dissemination programs and government procurement can all play role. However, government support for basic and applied research in energy technologies has been declining sharply since the early 1980's, and is now less than half of levels from the late 1970's (in constant dollars). FY98 proposed funding for related programs include: Climate Change Action Plan (DOE, EPA and USDA) -- \$277 million; Partnership for New Generation of Vehicles (DOE, DOC, NSF, EPA, and DOT) -- \$281 million; DOE's energy efficiency and renewables programs -- \$1.08 billion; and DoE's other energy efficiency and renewable energy technology investments -- \$670 million.

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Some agencies believe we should commit ourselves to an "Apollo mission" in this area -- an intensive program to develop the alternative energy technologies needed for the next century. Possibilities include fuel cells, advanced industrial turbines, advanced diesel engines and transportation biofuels. Such a program could pay dividends not only in terms of our climate change objectives, but also by helping U.S. exports and reducing U.S. dependence on foreign oil.

Federal budget constraints with respect to technology programs are significant. [OMB, DoE to expand]. However, there may be ways to increase support for such programs in the years ahead.

Some agencies believe it is important to emphasize that, although the benefits of government technology programs may be greater than their costs, such programs are unlikely to provide significant greenhouse gas emissions reductions in the short- or medium-term unless accompanied by market-based measures like an emissions trading program.

B. Options

OPTION 1: Increase support for technology programs.

Possible policies under this option include:

- veto threat on appropriations bills that do not provide President's FY98 request for renewable energy and energy efficiency (\$1.08 billion, a 21% increase over FY97 enacted levels),

- ask President's science advisory panel to report back by October, 1997 on ways to accelerate rates of technological change in energy, other sector, and

- commit to steadily increasing budget requests for renewable energy and energy efficiency over the next five years.

OPTION 2: Maintain status quo level of support for technology programs.

3. Should transition assistance be a central part of our climate change policy?

A. Background. [text to follow].

Additional background on transition assistance programs is set forth in Exhibit ____.

B. Recommendation. Participants in the "Assistant Secretaries group" agree that transition programs should be a central part of our climate change policy. Participants agree that

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important program design issues should be addressed in consultation with key constituencies. Such consultations could begin soon and continue through the summer and fall.

Option 1: Accept the recommendation.

Option 2: Do not accept the recommendation. Provide working groups with alternative direction.

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Table 1

Variable of Interest	Option 1 -- 10% below 1990 levels	Option 2 -- 1990 levels by 2010	Option 3 -- 10% above 1990 levels
GDP in 2005			
GDP in 2010			
GDP in 2020			
Implied price increase per ton of carbon in 2010			
Implied price increase per gallon of gasoline in 2010			
Implied price increase per ton of coal in 2010			
Implied average price increase for residential electricity in 2010			
Implied increase in average household energy costs in 2010			
Decline in overall energy use in 2010			
Increase in renewables (2010)			
Annual revenue raised by permit auction (2010)			

[other tables follow]



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

MEMBER

April 25, 1997

MEMORANDUM FOR STEVE SEIDEL
DAVID SANDALOW
MARK MAZUR

FROM: JEFF FRANKEL

96

I agree completely with Alicia's comments on the Climate Change Predecisional Draft, especially on the importance of getting the memo to principals and the centrality of the "\$100 billion issues".

Other substantive comments

p. 3 Cut "The rate of any such increase would [be] determined in large measure by the choice of implementation regime." While the choice obviously could have an effect on gasoline prices, I believe that it is not important enough to bear highlighting here.

Cut or modify "Improving the rate at which technologies are developed and diffused can significantly reduce costs (on the order of 30%)." This sentence has the implication, which we and some other agencies believe to be incorrect, that the government has it within its power to take policy measures (other than price measures) which are likely to have effects this large.

p. 4 II. B Add a fourth question on domestic implementation:

(i) Should all emission permits be allocated outright (e.g., "grandfathered," which is the equivalent of giving the \$100 billion of emission rights to those who have emitted in the past), (ii) should all permits be distributed in such a way as to raise revenue (e.g., auctioned, so as to raise \$100 billion in revenue), or (iii) should there be some combination of the two distribution schemes (such as grandfathering a large share at the beginning, but then phasing them out over a period of years, with the annually-auctioned share increasing over time).

p. 8 3A Sent. 2 add "slightly" after "technological change"; sent. 3 change "illustrate" to "claim;" and change the inappropriate phrase "market barriers" to the more accurate "public resistance."

p. 9 Main paragraph, at the end: add "On the other hand, some agencies believe that the benefits of such programs, while they might be large enough to justify the costs, are unlikely to accomplish a sizeable share of the required emission reductions, unless accompanied by additional market-oriented measures (implying substantial increases in the price of energy).

Minor stylistic suggestions

p. 1 "to fundamentally" is a split infinitive

p. 3 "70% of the emissions", rather than "70% of the reductions"

p. 8 3A delete "a" before faster.

In addition, regarding the Agency positions on emission budgets, I would like to contribute for the record my own proposal. I realize that it may not need to go into this memo. (I hope it is not ruled out by the bottom of page 4, together with the "early emissions budget" paragraph on p. 5.)

The proposal: Emissions shall be averaged over three-year periods. There shall be seven three-year periods [beginning, for example, in 2000 or 2002], with the peak-emissions period as the second of the seven. Whenever a country misses a three-year target it receives a warning; but a country is not ruled out of compliance unless it misses three such targets.

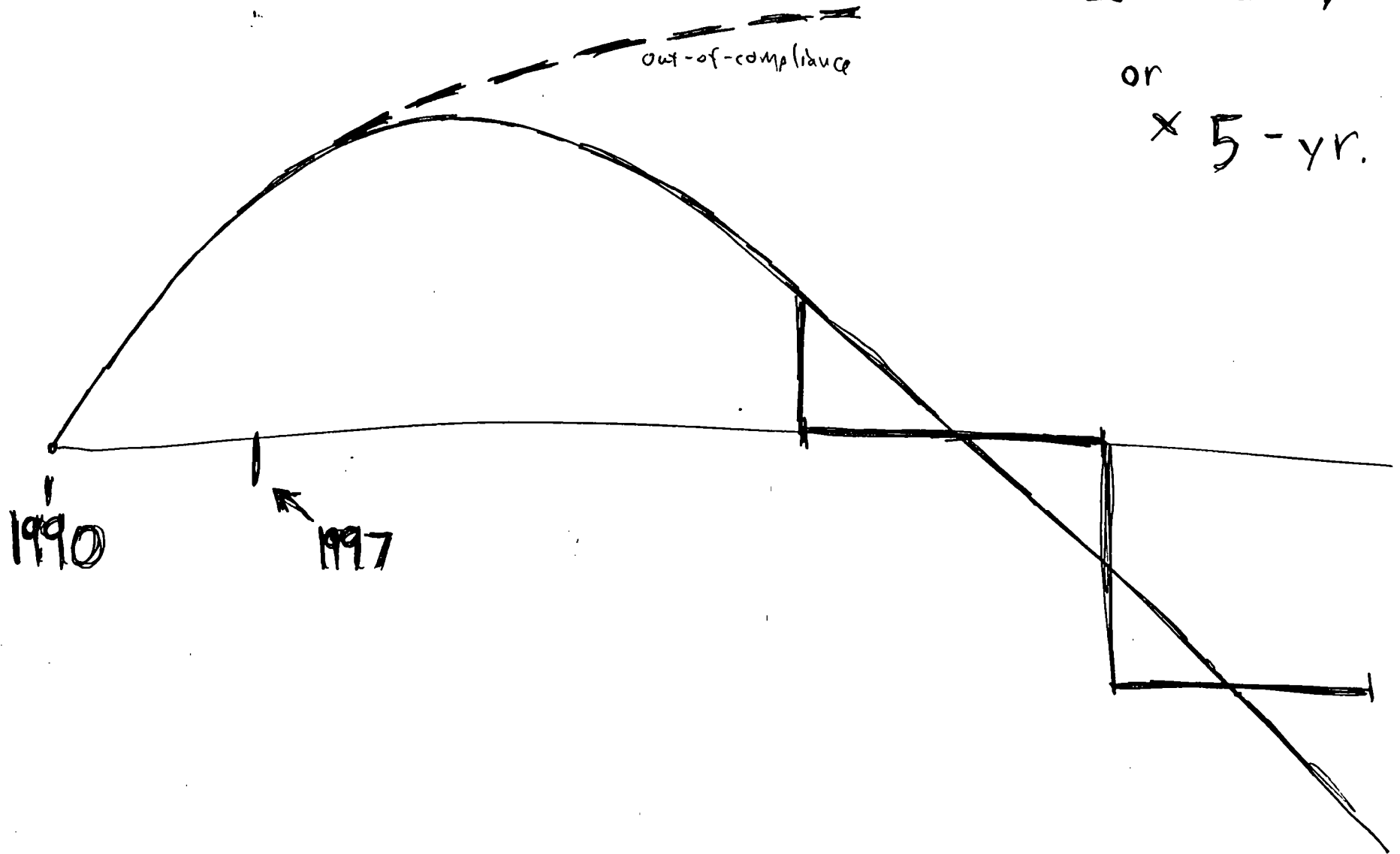
In other words, the binding requirement is to hit at least 5 of the 7 targets. Thus a country receives a clear warning at a stage when it is still feasible to get back into the system.

Existing plan:

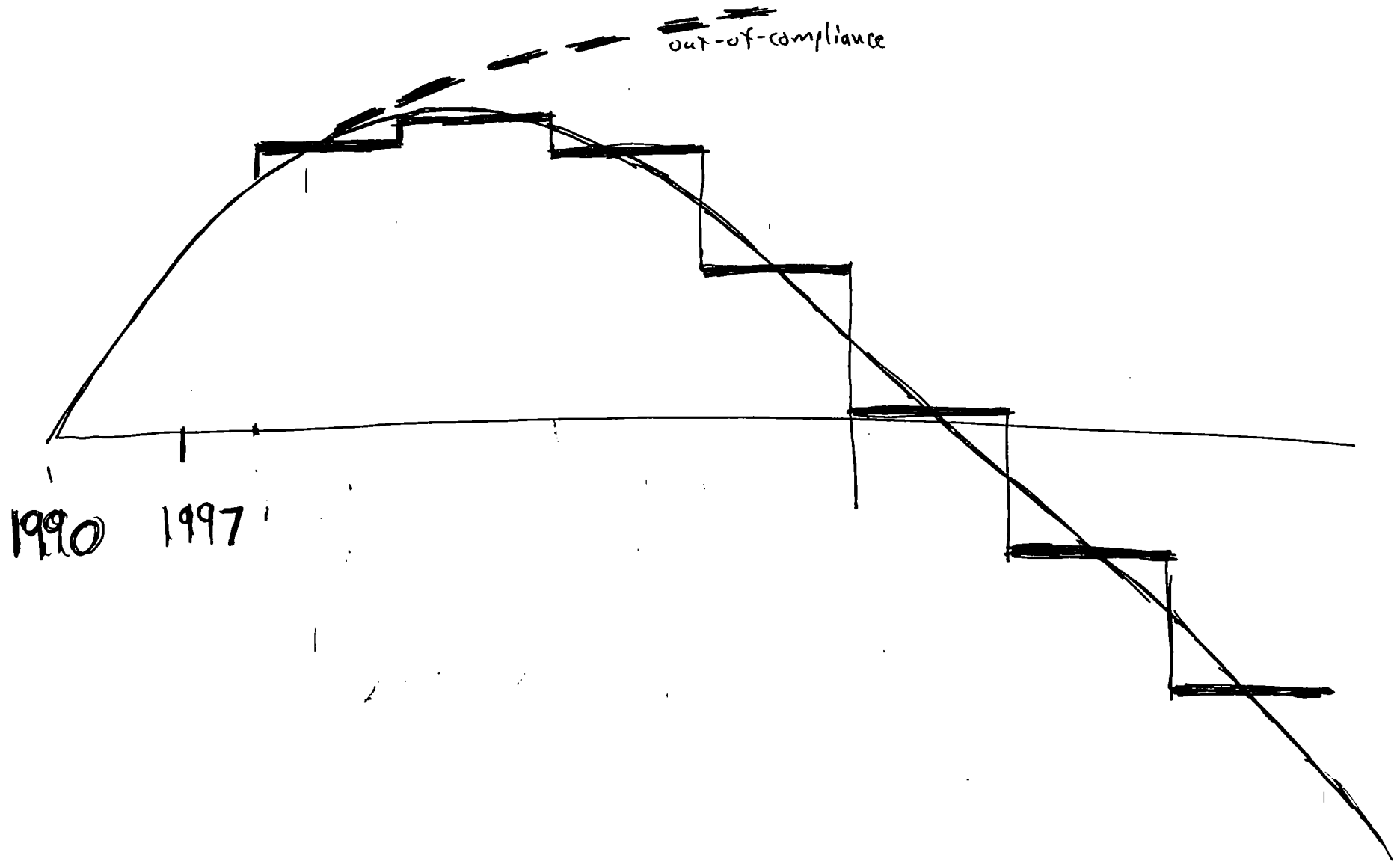
$2 \times 10\text{-yr.}$

or

$\times 5\text{-yr.}$



Frankel proposal: $7 \times 3\text{-yr.}$



1. Should domestic emissions trading be a central part of our climate change policy and, if so, on what timetable should the details of a program be developed?
2. Should the administration increase its support for technology programs to help address climate change?
3. Should transition assistance be a central part of our climate change policy and, if so, on what timetable should the details of a program be developed?

TENTATIVE TIME LINE FOR DECISION PROCESS

Third Week in May

Principals Meeting

Mid-May

Deputies Meeting

(implies that Assistant Secretaries sign off on decision memo by May 9)

May 7

Assistant Secretaries make final decisions on memo

April 30

Assistant Secretaries meet to discuss decision memo/attachments



MEMBER

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500
April 25, 1997

Chen
WPH
DP
MM
MS

MEMORANDUM FOR STEVE SEIDEL
DAVID SANDALOW
MARK MAZUR

FROM: ALICIA MUNNELLS

AM

Let me begin my comments by reiterating how pleased I am that we are finally drafting a document that will provide the basis for discussion with principals. The highest levels of the administration must decide whether or not they are willing to have the USG propose a policy that can be characterized as raising the price of gasoline by 20-30 cents, increasing the price of coal fivefold, and potentially raising \$100 billion per year through the sales of permits.

The fact that I view the economic implications of the target and timetable as the overarching issue strongly influences my view about the appropriate structure of the memo. Specifically, the primary thing we need to know is whether the principals are comfortable with a high, medium or low offer in the international negotiations. I think this should be the focus of the memo; domestic implementation should enter the discussion only as background. That is, we can tell the principals that we have tentatively decided that a domestic emissions trading program is the most efficient mechanism for meeting any targets decided upon in an international agreement. I don't think that this is an appropriate document for people to worry about whether we should increase our technology budget by a few hundred million. This memo should address the \$100 billion issues not the \$100 million issues.

Some specific suggestions

Page 1

- The introductory paragraph should lay out the decisions that we need to make in the international negotiating process.
- The 'Basis for Concern' section should include information on the sources of greenhouse gases.
- Somehow the introductory section should relate what we are contemplating doing in Kyoto to the larger issue of concentrations. My understanding is that even the most

aggressive steps we are thinking about between now and 2020 are minute compared to what needs to be done to have a serious effect on halting the build-up.

Page 2-3

- Economic Modeling Analyses does not need to be a separate section. It involves no policy decisions but rather simply provides estimates of the implications of alternatives. These estimates can be discussed in the context of evaluating alternative proposals.

Page 4-7

- In terms of the options, we need only directional guidance at this point. In terms of my own thinking, the easiest descriptions would be stabilizing at 1990 levels in the mid-term, something more stringent and something less stringent.
- We also need to include the possibility of doing something modest early in order to signal to business that the world is changing.
- Don't we also need to talk either here or in the introduction about what we envision doing after, say, 2020?
- Organizationally, I think it would be easier to lay out the three options and then have a summary discussion of economic, environmental, and political implications for all three options.

Page 7-9

- My view is that the entire domestic implementation discussion should be provided as background, not as decision issues. Essentially, we could say that we are considering a three pronged plan--emissions trading, investment in technology, and something else -- to reduce greenhouse gases.

4/23

MEMORANDUM FOR THE DEPUTIES

FROM:

SUBJECT: Climate Change

The United States must commit to a reduction from baseline emissions by a certain date. This commitment has important economic implications for the U.S. economy and for our standing in the international community.

International climate change negotiations are scheduled to conclude in December 1997. This memorandum describes the background of those negotiations and sets forth some key issues for decision.

I. BACKGROUND

A. Basis for Concern

The build-up of greenhouse gases in the atmosphere threatens to fundamentally alter the Earth's climate. The most recent international scientific assessment concluded that global average temperatures will increase by ^{could be as much as} 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 ____ years.

The principal cause of this build-up is the burning of fossil fuels. Other human activities, including deforestation, 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."

Potential impacts from climate change include sea level rise, the spread of infectious disease, more frequent and severe extreme weather events (such as floods, droughts and hurricanes), loss of forest cover, and shifts in agriculturally productive regions. However, significant uncertainties remain concerning the magnitude, timing and regional distribution of these impacts.

None of the actions contemplated during this round of negotiations will reverse the build-up of greenhouse gases in the atmosphere. This would require further steps by both developed and developing nations, well into the next century. ^{Rather, this agreement would lower the emissions from what they otherwise would have been over the medium term.} Additional detail is set forth in Exhibit A.

B. International Negotiating Context

There ^{community} is an international agreement that the climate change problem is significant and warrants additional near-term action. Further, there ^{community} is a global recognition that the existing UN

Framework Convention on Climate Change, signed in 1992, is ^{quite open} inadequate to address this near-term need. The current round of negotiations is intended to ~~address~~ steps in the post-2000 period. In July 1996, the U.S. called for an approach that would include three key elements: a legally binding target (instead of the voluntary aims of the existing Convention), flexibility in implementation (e.g., emission trading and joint implementation), and the participation of developing countries. The U.S. proposal did not include a recommendation on an emissions budget (i.e., target and timetable).

Views of other countries vary considerably. Two proposals with targets and timetables have been put forward: small island nations have proposed that developed ^{countries} reduce emissions by 20% ^{pruned} from 1990 levels by 2005, and the European Union has proposed that developed nations cut back 10-15% from 1990 levels by 2010. (The EU also proposed a yet unspecified target for 2005). Other nations including, including Australia, Japan and Canada have expressed concerns about moving too far too fast, but have not put forward any specific targets. Developing countries have strongly opposed any binding commitments on their part, stating that developed countries have been the largest source of emissions and must take the lead in addressing this problem.

Additional detail is set forth in Exhibit B.

C. Economic Modeling Analyses

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

^{Althorn} Economic modeling is not a precise science. Results depend heavily on assumptions that may or may not prove accurate. There is a significant risk of "false precision" (i.e., the use of point estimates to simplify presentation of results may obscure the considerable margin of error in any prediction). Similar (though in many respects simpler) modeling in the past (e.g., with the Clean Air Act's acid rain trading program) failed accurately to predict the costs of environmental controls. Therefore, the figures presented should be viewed as very rough estimates only.

Among the more important conclusions of the IAT are the following:

--Without policy interventions, emissions of greenhouse gases are projected to rise ____% from 1990 levels by 2010 and ____ by 2020. Greenhouse gas emissions from the developing world are projected to rise ____% from 1990 levels by 2010 and ____% by 2020.

→ Would to tell principals that we are
supplying \$100 billion per year.

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--Stabilizing US greenhouse gas emissions at 1990 levels in the medium-term (2006-2020) would likely lead to:

US GDP loss = x
smaller by 2
5.55 x 46.
without or some other flexible scheme, GDP loss 20 could be larger
if emissions controls increased, then GDP loss 20 could be larger
-- US GDP losses of roughly .5-1%, in the early years of a flexible compliance program, (such as an emissions trading regime). GDP impacts could be considerably smaller, depending on rates of technology penetration and other factors. Some models project GDP increases above baseline levels in later years, if implementation programs are structured to spur capital investment or help reduce the federal deficit.

-- Gasoline prices in the period 2006-2020 roughly 20-30 cents above 1997 levels. The rate of any such increase would determined in large measure by the choice of implementation regime.

--Coal prices in the period 2006-2020 roughly 300% of 1997 levels.

--Improving the rate at which technologies are developed and diffused can significantly reduce costs (on the order of 30%).

-- Unlimited trading among developed countries could decrease costs in the US by roughly 60%. About half of U.S. reductions would be purchased from abroad, mostly from Russia. This would lead to transfers abroad of approximately \$___ billion per year. Unlimited trading among developed and developing countries could reduce US GDP costs over the 2006-2020 time frame by 85%, with over 70% of the reductions purchased from Russia, China and India.

--The United States can meet emission reductions targets at a lower cost than most other developed countries (including most European Union countries, Canada, Japan and Australia).

Additional details set forth in Exhibit C.

D. Political Considerations

II. ISSUES FOR DECISION

This section poses the following issues for decision:

A. What emissions budget should the US support?

B. With respect to domestic implementation: *what should the US do regarding international agreement*

- Principles don't have to focus on this*
1. Should the administration support a domestic emissions trading program and, if so, on what timetable should the details of that program be developed?
 2. Should transition assistance be a central part of our climate change policy and, if so, on what timetable should the details of a program be developed?
 3. Should the administration increase its support for technology programs to help address climate change?

A. What emissions budgets should the US support?

1. Background

In climate change negotiations, the term "emissions budget" refers to the amount of greenhouse gases that may be emitted over a certain time period. The term is roughly synonymous with "target and timetable" (~~though an "emissions budget" connotes a longer period of time than a "target"~~).

To date, the United States ~~has not supported any emissions budget for the post-2000 period~~. Our statements with respect to emissions budgets have been limited to the following:

- This round of negotiations should address emissions in the period 2006-2020.
- The base year for emissions budgets should be 1990.
- Emissions budgets should consist of multi-year periods (i.e., the target should not be a single year).

1. stabilizing at 1990 levels by 2010
2. more ambitious
3. less ambitious

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4/23

2. Agency Positions

Agencies have expressed support for the following emissions budgets:

OPTION 1: Achieve 90% of 1990 levels by a multi-year period around 2010.

OPTION 2: Achieve 95% of 1990 levels by a multi-year period around 2010.

OPTION 3: Achieve 1990 levels by a multi-year period around 2010.

OPTION 4: Achieve 1990 levels, on average, from 2010-2019.

Agencies have also supported several specific emissions budgets beyond the first budget period. The draft US negotiating text envisions emissions budgets in one or more periods. Some agencies view progressive reductions beyond the first budget period as a critical part of any US position.

In addition, some agencies support an "early emissions budget" in the period around 2005, less stringent than the Options described above. This would require a change in the US position, but could possibly be structured to win support from domestic constituencies and other countries in the negotiations.

The availability of various flexibilities (international emissions trading, joint implementation, banking and borrowing) fundamentally affects the emissions budgets the United States would be willing to support. The more such provisions are included in the agreement, the less costly it will be for the US to meet any given emissions budget. However, if the entire US obligation can be satisfied by purchasing low-cost reductions from abroad, the agreement will not provide large incentives for US industry to develop the technologies needed to address the climate change problem over the long-term.

3. Analysis of different options

The discussion below analyzes the four options supported by agencies based on: environmental impacts, economic impacts, domestic political implications, and implications for the international negotiations.

a. Environmental impacts

In terms of additional loadings of greenhouse gases into the atmosphere, the difference between the four options in the short-term is small. Under Option 1 (the most stringent), greenhouse gas concentrations in the atmosphere would likely be ____ ppm by 2015; under Option 4 (the least stringent), concentrations would likely be ____ ppm. This alone does not equate to significant environmental impacts.

However, the four options may produce different environmental impacts when considered as part of a longer, multi-decade path of reduced greenhouse gas emissions. 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 no later than _____. For the world realistically to avoid a near-tripling of greenhouse gas concentrations (750 ppm) in the next century, global emissions must deflect from this "business-as-usual" path by _____. 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. This analysis is described in more detail in Exhibit _____.

Institutional and political factors also lead to important differences between these options. Some agencies believe that business will not take Option 4 seriously, because the budget period is too distant. Some agencies believe that business will not take Option 1 seriously, since the economic costs would be too great, and will simply work block implementation rather than restructure activities to comply. All agencies agree that developing countries, who will represent the bulk of emissions growth in the decades ahead, will only take serious actions to address emissions after the developed world has done so. This tends to argue for early, serious action, to leverage reductions in the developing world.

b. Economic impacts

c. Domestic political implications

As of today, Options 1 and 2, and to a lesser extent Option 3, would be perceived as very strong environmental positions. Environmental constituencies would cheer; some business and regional interests would strongly oppose. Ratification of agreements with such emissions budgets would be very challenging for the foreseeable future.

Most environmentalists would see Option 4 as unacceptable delay. More moderate business interests (e.g. utilities, chemical companies, natural gas) would be supportive.

budgets
can write
after year
of decision

down in
box
here

Already?
mentioned
economic impacts
on p. 2

Do
principles
need
to know
this?

What we do after 2020 is
more important than how much
we reduce greenhouse gases
by 2020

all but the least ambitious option

the least ambitious

Oil and coal lobbies will oppose any of these options, with considerable intensity. Heavy manufacturing will likely oppose these options as well, although there may be some opportunities for strategic alliances.

d. International negotiating implications

*Revised
need to*
B. Domestic Implementation - *Burning agreement or not?*

1. Should the administration support a domestic emissions trading program and, if so, on what timetable should the details of that program be developed?

A. Background. All agencies agree that an emissions trading program should be a central part of our domestic climate change program. ~~Under an emissions trading program, permits~~ *would distribute* representing rights to emit greenhouse gases ~~would be distributed~~, either through an auction or allocation system. Trading of permits would allow firms to reduce compliance costs. Firms would have an incentive to control emissions where low cost reductions are feasible and to sell these reductions to other firms facing higher control costs.

Key issues in designing an emissions trading program include the following:

-- ~~How should permits be distributed, 126~~
-- ~~Who gets emissions rights. Permits could be given to existing emitters, given to others, auctioned to the highest bidders, or some combination of the foregoing. If auctioned, substantial revenues could be raised. Revenue reflow options include tax cuts to personal income, payroll or corporate taxes; deficit reduction; and support for transitional or technology programs. If given to existing emitters, potentially substantial windfalls would go to permit holders.~~

--Where the cap is imposed: primary fuel versus sectoral.

--Comprehensiveness: all greenhouse gases could be covered under the program or only some subset (e.g., fossil fuels, fluorinated chemicals and methane).

B. Issue for Decision. At this time, the key decisions concerning emissions trading relate to the schedule for program development. Some agencies believe that key elements of program design should be decided quickly, to inform decisions on emissions budgets. Other agencies believe we should consult with domestic constituencies over the course of this calendar year before agreeing on key elements of program design.

OPTION 1: Support emissions trading, and work to define details of a program for announcement this summer.

Pros:

Cons: would be difficult to get meaningful feedback from constituencies before US further defines its position on emissions budgets.

OPTION 2: Support emissions trading, and consult with stakeholders to define details of a program for announcement late this fall or after Kyoto.

Pros:

Cons:

OPTION 3: Do not support emissions trading.

Pros:

Cons:

too discussed

2. Should a transition program be a central part of the administration's climate change policy and, if so, on what timetable should the details of that program be developed?

|| 3. Should the administration increase its support of technology programs to help address climate change?

A. Background. ~~The economic analyses presented above demonstrates the potentially significant cost savings associated with a faster rates of technological change.~~ While we might expect some acceleration in the rate of technological change under an emissions trading program, some potential also exists for specific technology programs to spur technological change. The Climate Change Action Plan activities illustrate the potential for achieving significant greenhouse gas reductions by overcoming market barriers (e.g., information about new technologies). Current proposed funding for related programs include the following in FY 98: Climate Change Action Plan (DOE, EPA and USDA) -- \$277 million; Partnership for New

Generation of Vehicles (DOE,DOC, NSF, EPA, and DOT) -- \$281 million; and DOE's energy efficiency and renewables -- \$1.08 billion.

Technology programs in such areas as fuel cells, advanced industrial turbines, advanced diesel engines, transportation biofuels, etc. could be adopted with the potential of accelerating development and diffusion of enhanced energy efficiency and lower cost alternatives to fossil fuels. These programs would not only reduce the costs of meeting any agreed upon target and timetable, but would also enhance U.S. competitiveness in what is likely to be a highly competitive growth market for exports and could also improve our energy security by decreasing our dependence on foreign oil.

B. Issue for Decision

OPTION 1: Increase support for technology programs.

Possible policies under this option include:

- veto threat on appropriations bills that do not provide President's FY98 request for renewable energy and energy efficiency (\$1 billion, a 21% increase over FY97 enacted levels),
- ask President's science advisory panel to report back by October, 1997 on ways to accelerate rates of technological change in energy, other sector, and
- commit to steadily increasing budget requests for renewable energy and energy efficiency over the next five years.

OPTION 2: Status quo level of support for technology

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4/23

MEMORANDUM FOR THE DEPUTIES

FROM:

SUBJECT: Climate Change

International climate change negotiations are scheduled to conclude in December 1997. This memorandum describes the background of those negotiations and sets forth some key issues for decision.

I. BACKGROUND

A. Basis for Concern

The build-up of greenhouse gases in the atmosphere threatens to fundamentally 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 ____ years.

The principal cause of this build-up is the burning of fossil fuels. Other human activities, including deforestation, 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."

Potential impacts from climate change include sea level rise, the spread of infectious disease, more frequent and severe extreme weather events (such as floods, droughts and hurricanes), loss of forest cover, and shifts in agriculturally productive regions. However, significant uncertainties remain concerning the magnitude, timing and regional distribution of these impacts

None of the actions contemplated during this round of negotiations will reverse the build-up of greenhouse gases in the atmosphere. This would require further steps by both developed and developing nations, well into the next century.

Additional detail is set forth in Exhibit A.

B. International Negotiating Context

There is international agreement that the climate change problem is significant and warrants additional near-term action. Further, there is a global recognition that the existing UN

Framework Convention on Climate Change, signed in 1992, is inadequate to address this near-term need. The current round of negotiations is intended to address steps in the post-2000 period. In July 1996, the U.S. called for an approach that would include three key elements: a legally binding target (instead of the voluntary aims of the existing Convention), flexibility in implementation (e.g., emission trading and joint implementation), and the participation of developing countries. The U.S. proposal did not include a recommendation on an emissions budget (i.e., target and timetable).

Views of other countries vary considerably. Two proposals with targets and timetables have been put forward: small island nations have proposed that developed nations reduce emissions by 20% from 1990 levels by 2005, and the European Union has proposed that developed nations cut back 10-15% from 1990 levels by 2010. (The EU also proposed a yet unspecified target for 2005). Other nations including, including Australia, Japan and Canada have expressed concerns about moving too far too fast, but have not put forward any specific targets. Developing countries have strongly opposed any binding commitments on their part, stating that developed countries have been the largest source of emissions and must take the lead in addressing this problem.

Additional detail is set forth in Exhibit B.

C. Economic Modeling Analyses

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

Economic modeling is not a precise science. Results depend heavily on assumptions that may or may not prove accurate. There is a significant risk of “false precision” (i.e., the use of point estimates to simplify presentation of results may obscure the considerable margin of error in any prediction). Similar (though in many respects simpler) modeling in the past (e.g., with the Clean Air Act’s acid rain trading program) failed accurately to predict the costs of environmental controls. Therefore, the figures presented should be viewed as very rough estimates only.

Among the more important conclusions of the IAT are the following:

--Without policy interventions, emissions of greenhouse gases are projected to rise ____% from 1990 levels by 2010 and ____ by 2020. Greenhouse gas emissions from the developing world are projected to rise _____% from 1990 levels by 2010 and _____% by 2020.

--Stabilizing US greenhouse gas emissions at 1990 levels in the medium-term (2006-2020) would likely lead to:

-- US GDP losses of roughly .5-1%, in the early years of a flexible compliance program (such as an emissions trading regime). GDP impacts could be considerably smaller, depending on rates of technology penetration and other factors. Some models project GDP *increases* above baseline levels in later years, if implementation programs are structured to spur capital investment ~~to~~ help reduce the federal deficit. *or otherwise*

-- Gasoline prices in the period 2006-2020 roughly 20-30 cents above 1997 levels. The rate of any such increase would be determined in large measure by the choice of implementation regime.

--Coal prices in the period 2006-2020 roughly 300% of 1997 levels.

--Improving the rate at which technologies are developed and diffused can significantly reduce costs (on the order of 30%).

-- Unlimited trading among developed countries could decrease costs in the US by roughly 60%. About half of U.S. reductions would be purchased from abroad, mostly from Russia. This would lead to transfers abroad of approximately \$___ billion per year. Unlimited trading among developed and developing countries could reduce US GDP costs over the 2006-2020 time frame by 85%, with over 70% of the *reductions* purchased from Russia, China and India.

--The United States can meet emission reductions targets at a lower cost than most other developed countries (including most European Union countries, Canada, Japan and Australia).

Additional detail is set forth in Exhibit C.

D. Political Considerations

II. ISSUES FOR DECISION

This section poses the following issues for decision:

A. What emissions budget should the US support?

B. With respect to domestic implementation:

1. Should the administration support a domestic emissions trading program and, if so, on what timetable should the details of that program be developed?
2. Should transition assistance be a central part of our climate change policy and, if so, on what timetable should the details of a program be developed?
3. Should the administration increase its support for technology programs to help address climate change?

(Growth) (rate)
or auction ~~tax~~
eq. 6.2

A. What emissions budgets should the US support?

1. Background

In climate change negotiations, the term "emissions budget" refers to the amount of greenhouse gases that may be emitted over a certain time period. The term is roughly synonymous with "target and timetable" (though an "emissions budget" connotes a longer period of time than a "target").

To date, the United States has not supported any emissions budget for the post-2000 period. Our statements with respect to emissions budgets have been limited to the following:

--This round of negotiations should address emissions in the period 2006-2020.

2006 - 2020

--The base year for emissions budgets should be 1990.

--Emissions budgets should consist of multi-year periods (i.e., the target should not be a single year).

2. Agency Positions

Agencies have expressed support for the following emissions budgets:

OPTION 1: Achieve 90% of 1990 levels by a multi-year period around 2010.

OPTION 2: Achieve 95% of 1990 levels by a multi-year period around 2010.

OPTION 3: Achieve 1990 levels by a multi-year period around 2010.

OPTION 4: Achieve 1990 levels, on average, from 2010-2019.

Agencies have also supported several specific emissions budgets beyond the first budget period. The draft US negotiating text envisions emissions budgets in one or more periods. Some agencies view progressive reductions beyond the first budget period as a critical part of any US position.

In addition, some agencies support an "early emissions budget" in the period around 2005, less stringent than the Options described above. This would require a change in the US position, but could possibly be structured to win support from domestic constituencies and other countries in the negotiations.

The availability of various flexibilities (international emissions trading, joint implementation, banking and borrowing) fundamentally affects the emissions budgets the United States would be willing to support. The more such provisions are included in the agreement, the less costly it will be for the US to meet any given emissions budget. However, if the entire US obligation can be satisfied by purchasing low-cost reductions from abroad, the agreement will not provide large incentives for US industry to develop the technologies needed to address the climate change problem over the long-term.

3. Analysis of different options

The discussion below analyzes the four options supported by agencies based on: environmental impacts, economic impacts, domestic political implications, and implications for the international negotiations.

a. Environmental impacts

In terms of additional loadings of greenhouse gases into the atmosphere, the difference between the four options in the short-term is small. Under Option 1 (the most stringent), greenhouse gas concentrations in the atmosphere would likely be ____ ppm by 2015; under Option 4 (the least stringent), concentrations would likely be ____ ppm. This alone does not equate to significant environmental impacts.

However, the four options may produce different environmental impacts when considered as part of a longer, multi-decade path of reduced greenhouse gas emissions. 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 no later than _____. For the world realistically to avoid a near-tripling of greenhouse gas concentrations (750 ppm) in the next century, global emissions must deflect from this "business-as-usual" path by _____. 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. This analysis is described in more detail in Exhibit ____.

Institutional and political factors also lead to important differences between these options. Some agencies believe that business will not take Option 4 seriously, because the budget period is too distant. Some agencies believe that business will not take Option 1 seriously, since the economic costs would be too great, and will simply work block implementation rather than restructure activities to comply. All agencies agree that developing countries, who will represent the bulk of emissions growth in the decades ahead, will only take serious actions to address emissions after the developed world has done so. This tends to argue for early, serious action, to leverage reductions in the developing world.

b. Economic impacts

c. Domestic political implications

As of today, Options 1 and 2, and to a lesser extent Option 3, would be perceived as very strong environmental positions. Environmental constituencies would cheer; some business and regional interests would strongly oppose. Ratification of agreements with such emissions budgets would be very challenging for the foreseeable future.

Most environmentalists would see Option 4 as unacceptable delay. More moderate business interests (e.g. utilities, chemical companies, natural gas) would be supportive.

Oil and coal lobbies will oppose any of these options, with considerable intensity. Heavy manufacturing will likely oppose these options as well, although there may be some opportunities for strategic alliances.

d. International negotiating implications

B. Domestic Implementation

1. Should the administration support a domestic emissions trading program and, if so, on what timetable should the details of that program be developed?

A. Background. All agencies agree that an emissions trading program should be a central part of our domestic climate change program. Under an emissions trading program, permits representing rights to emit greenhouse gases would be distributed, either through an auction or allocation system. Trading of permits would allow firms to reduce compliance costs. Firms would have an incentive to control emissions where low cost reductions are feasible and to sell these reductions to other firms facing higher control costs.

Key issues in designing an emissions trading program include the following:

--Who gets emissions rights. Permits could be given to existing emitters, given to others, auctioned to the highest bidders, or some combination of the foregoing. If auctioned, substantial revenues could be raised. Revenue reflow options include tax cuts to personal income, payroll or corporate taxes; deficit reduction; and support for transitional or technology programs. If given to existing emitters, potentially substantial windfalls would go to permit holders.

--Where the cap is imposed: primary fuel versus sectoral.

--Comprehensiveness: all greenhouse gases could be covered under the program or only some subset (e.g., fossil fuels, fluorinated chemicals and methane).

B. Issue for Decision. At this time, the key decisions concerning emissions trading relate to the schedule for program development. Some agencies believe that key elements of program design should be decided quickly, to inform decisions on emissions budgets. Other agencies believe we should consult with domestic constituencies over the course of this calendar year before agreeing on key elements of program design.

OPTION 1: Support emissions trading, and work to define details of a program for announcement this summer.

Pros:

Cons: would be difficult to get meaningful feedback from constituencies before US further defines its position on emissions budgets.

OPTION 2: Support emissions trading, and consult with stakeholders to define details of a program for announcement late this fall or after Kyoto.

Pros:

Cons:

OPTION 3: Do not support emissions trading.

Pros:

Cons:

2. Should a transition program be a central part of the administration's climate change policy and, if so, on what timetable should the details of that program be developed?

3. Should the administration increase its support of technology programs to help address climate change?

A. Background. The economic analyses presented above demonstrates the potentially significant cost savings associated with a faster rates of technological change. While we might expect some acceleration in the rate of technological change under an emissions trading program, some potential also exists for specific technology programs to spur technological change. The Climate Change Action Plan activities illustrate the potential for achieving significant greenhouse gas reductions by overcoming market barriers (e.g., information about new technologies). Current proposed funding for related programs include the following in FY 98: Climate Change Action Plan (DOE, EPA and USDA) -- \$277 million; Partnership for New

slightly
by FY 98

Generation of Vehicles (DOE, DOC, NSF, EPA, and DOT) -- \$281 million; and DOE's energy efficiency and renewables -- \$1.08 billion.

Technology programs in such areas as fuel cells, advanced industrial turbines, advanced diesel engines, transportation biofuels, etc. could be adopted with the potential of accelerating development and diffusion of enhanced energy efficiency and lower cost alternatives to fossil fuels. These programs would not only reduce the costs of meeting any agreed upon target and timetable, but would also enhance U.S. competitiveness in what is likely to be a highly competitive growth market for exports and could also improve our energy security by decreasing our dependence on foreign oil.

On the other hand, some agencies feel that the benefits of such programs, even if large enough to justify the costs, are unlikely to accomplish a sizeable share of the required emission reduction unless accompanied by substantial increases in the price of energy.

B. Issue for Decision

OPTION 1: Increase support for technology programs.

Possible policies under this option include:

-veto threat on appropriations bills that do not provide President's FY98 request for renewable energy and energy efficiency (\$1 billion, a 21% increase over FY97 enacted levels),

-ask President's science advisory panel to report back by October, 1997 on ways to accelerate rates of technological change in energy, other sector, and

-commit to steadily increasing budget requests for renewable energy and energy efficiency over the next five years.

OPTION 2: Status quo level of support for technology

FROM: David Doniger, U.S. EPA, Air and Radiation 260-2865 AND
David Gardiner, U.S. EPA, Policy, Planning and Evaluation 260-4332

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cc: JAF
mm
JS

Note to David Sandalow, Mark Mazur, Steve Seidel
From David Doniger and David Gardiner, EPA
Re: Draft Memo
April 28, 1997

The draft memo is a solid start. We have the following suggestions for refining it. Our primary concerns fall in five areas:

- (1) The background section on environmental impacts needs to be sharpened. Key points to add are given below.
- (2) The background section on economic modeling also needs to be elaborated and sharpened. Attachment A is a suggested redrafting of this section.
- (3) We should move forward with modeling the environmental and economic implications of emissions budget scenarios of interest. The main issue for now is to frame appropriate scenarios for analysis so that results will be available in a useful timeframe.
- (4) The discussion of emissions trading in domestic implementation needs to be sharpened to frame key substantive issues and key issues of timing and process for further policy development. Attachment B is a suggested redrafting of this section.
- (5) The technology development discussion in the memo (and the background paper) does not include sufficient emphasis on near-term technology diffusion. We will provide suggested changes to the background paper and this section of the memo later today.

1. Environmental Background (Section I(A))

Several additional major points need to come across in the short section on "basis for concern."

- The first paragraph inadvertently suggests that the problem "tops out" at 2-6.5 degrees and 2100. It should note that the temperature will continue to increase, and impacts will continue to worsen, thereafter. An illustration might be sea level rise — a doubling of pre-industrial GHG levels implies not only an 18 inch sea level rise in the next century, but an eventual and unstoppable rise of 7 feet over the longer term.
- The second paragraph should note the irreversibility and the potential magnitude of the problem (long atmospheric life-times of gases, long lead-time needed to significantly change emissions paths, the global scope and extraordinary magnitude of potential impacts).

- There should be a new third paragraph addressing emissions-to-concentration relationships. It should say that emissions to date have already raised GHG levels ___ percent over pre-industrial levels, that business-as-usual emissions scenarios imply a doubling by ___, a tripling or quadrupling by ___, etc. It should say that most assessments to date have looked at impacts in a doubling scenario only, and that significant adverse effects would be associated with a doubling, and even greater risks with higher levels.
- The current third paragraph, on impacts, should begin by quoting the following sentence from the 1995 IPCC WGII summary: "Climate change is likely to have wide-ranging and mostly adverse impacts on human health, with significant loss of life." Deaths from heat-stress should be specifically mentioned. The last sentence on uncertainties should mention the possibility of unforeseen adverse surprises, analogous to appearance of the ozone hole (e.g., potential change in gulf stream resulting in the freezing of Northern Europe).
- The last paragraph should begin by concluding that the potential magnitude and essential irreversibility of our actions argue for a precautionary approach. It can then say (more positively than as drafted): "Actions being considered during this round of negotiations will not, by themselves, stop the build-up of GHGs in the atmosphere. The results of this round, however, will send important market signals regarding the priority of developing and applying climate-friendly technologies, and will set the stage for future rounds of negotiations over further steps in the next century by both developed and developing countries."

2. Economic Impact (Section I(C))

This section currently does not present sufficient information on model characteristics and limitations, and on key assumptions that affect model results. The current draft of this section also peeks ahead too far to the impacts associated with scenarios, before those scenarios have been set forth. It would be better to concentrate at this point in the memo on the model characteristics, limitations, and key assumptions. Results associated with scenarios would be better relocated to the "economic impacts" discussion on page 6. A suggested redraft of Section I(C) is attached.

3. Scenarios

We have thought further about whether the memo should discuss specific scenarios or just directional indicators (flat, lower, or higher). We agree that in June it may be sufficient for the Administration to be in a position to make public a directional signal, without specific numbers. In order to get to that point, however, we need to provide decisionmakers with environmental and economic information on some specific, indicative scenarios. So we would move forward on attempting to model and report the environmental and economic results of such scenarios.

Some runs have been done of alternate scenarios (10% above and below 1990 levels in 2010, and 1990 levels in 2005 and 2015). The group may also want to refine the scenarios in the chart we handed out at the last meeting (knocking some out for the sake of simplicity, e.g., the 95% case) and ask for more runs. These will be useful for later, finer grain decisions even they won't be done by in late May.

4. Discussion of Domestic Implementation Options

The discussion of domestic implementation issues (Section II(B)) should be recast and sharpened.

- It currently identifies three issues for separate treatment: design of emissions trading systems, design of adjustment assistance programs, and design of programs to accelerate technology diffusion. We would switch the technology development and transition assistance sections. The nature and extent of transition problems is largely a function of the cost of the program. The technology acceleration programs will reduce those costs and possibly alter on whom they fall. Transition assistance thus should be addressed last.
- The emissions trading discussion currently focuses on whether to develop and announce a full-blown cap-and-trade program this summer, or whether to proceed more slowly with a stakeholder process. The former is not, practically, a real option. The real issues are choices within the latter option.
- In addition, the emissions trading discussion misses the opportunity to explain key interactions, i.e., how the specific design of cap-and-trade programs can be used to (1) foster faster technology progress, (2) avoid excessive price increases and wealth transfers in sensitive areas, and (3) provide transition assistance or compensation to heavily impacted groups.

A suggested redraft of Section B(1) is attached.

5. Discussion of Technology Programs

As noted above, the discussion of technology development in the memo (and the background paper) does not include sufficient emphasis on near-term technology diffusion. We will provide suggested changes to the background paper and this section of the memo later today.

Attachment A: Suggested changes to Section I(C), Economic Modeling Analyses

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

Economic modeling is not a precise science, especially when looking 10-25 years into the future. Results depend heavily on the choice of models and on key assumptions used in those models. Models designed to assess economic performance over short time periods (1/2-2 years) tend to overestimate dislocations when used over a 10-20 year timeframe, while other models designed to assess long-term equilibria may underestimate short term dislocations. Some models have richer descriptions of real technology choices than others. Some models can simulate multilateral action, while others effectively assume unilateral U.S. action, which overstates U.S. impacts. Many key assumptions in the models are subject to policy control or influence (e.g., costs and diffusion rates for improved technology, design of the tradeable permits system, Federal Reserve responses). Thus deciding which models and what assumptions are the most reasonable is a key issue in determining which results are most pertinent for decisionmaking and public debate.

With all models, there is a significant risk of "false precision" (i.e., point estimates of results may obscure considerable margins of error). Similar (although in many respects simpler) modeling in the past (e.g., for the Clean Air Act's acid rain cap-and-trade program) substantially overstated the costs of environmental controls. Therefore, the figures presented should be considered carefully in light of model and assumption choices and viewed as very rough estimates only.

Among the more important IAT results are the following:

--Baseline. Without policy interventions, emissions of greenhouse gases are projected to rise considerably. Emission in the U.S., other developed countries, and developing countries are projected to grow above 1990 levels by __%, __%, and __% by 2010, and by __%, __%, and __% by 2020.

--Scenarios. The IAT chose as a "benchmark" scenario returning U.S. emissions of GHGs to the 1990 level by 2010 and maintaining that level through 2020. Other scenarios were run varying the emission level and/or the timing.

--All scenarios assumed flexible, market-based domestic implementation programs (such as an emission trading regime). Some scenarios included the additional flexibility of *international* emissions trading with developed and developing countries. None of the scenarios, however, captured all of the flexibility options included in U.S. proposals (i.e., none simulated the cost-reducing potential of

multi-year averaging, banking, and borrowing).

--Assumptions. Key policy-relevant assumptions include [rates of technology diffusion and R&D, choices as to the ownership and disposition of the value of emissions permits, Fed responses, [others?]] These assumptions have large impacts on the results. For example:

--Improving the rate at which energy-efficiency technologies are developed and diffused can reduce costs significantly. Costs projected under relatively slow technology diffusion assumptions are approximately _% greater than under accelerated diffusion assumptions.

--The maximum GDP loss assuming adverse Fed responses [another example: adverse policies on revenue recycling] is _ times more severe than under more favorable assumptions.

--International Emissions Trading. International trading can also substantially reduce costs. Unlimited emissions trading among developed countries could reduce costs in the U.S. by up to roughly 60%. In this case, about half of U.S. reductions would be purchased from abroad, mostly from Russia. While U.S. costs would be reduced, approximately \$__ billion per year would be transferred abroad. Unlimited trading among developed and developing countries could reduce US costs by 85%, with over 70% of the reductions purchased from Russia, China, and India.

--General Conclusions. Considering model limitations and reasonable assumptions concerning accelerated rates of technological change, stabilizing U.S. greenhouse gas emissions at 1990 levels from 2010 through 2020 could lead to:

--short-term GDP losses in the early years of less than _% in the year of maximum impact (around 20__?). Some [Most?/two?] of the models project GDP *increases* above baseline in subsequent years if implementation programs are structured to spur capital investment or reduce the federal deficit.

--increases in average household energy costs (heating and cooling plus gasoline) of approximately __%. This cost increase is the net effect of higher energy prices (e.g., __-__ cents per gallon of gasoline) partially offset by lower energy demand due to use of more energy-efficient equipment, vehicles, etc. (Some program designs could lead to large windfall profits; disposition of permits could prevent or recoup windfall profits and compensate energy users for most of potential price increases.)

--coal and oil demand could drop by __% and __%, respectively; natural gas demand could increase by __% [Note, should focus on fuel demand (or production levels), not fuel prices, at least not exclusively. In options modeled so far, permits are required of fuel providers and thus the permit price shows up bundled in the apparent prices of coal or gasoline. In other system designs (e.g., where power generators or auto companies have the requirement to have a permit), permit prices will *not* be bundled in with fuels. In fact, coal or gasoline prices would be driven *down* under these designs. Fuel demand (or production) will be far more constant between options than fuel price. If avoiding fuel price increases is an important consideration, some designs will recommend themselves over others.]

--renewable energy production could increase by __%.

--employment in key areas....

--International Competitiveness. The United States can meet emission reductions targets at lower cost than most other developed countries (including most European Union countries, Canada, Japan, and Australia). [There is little evidence of competitive disadvantage regarding developing countries, especially if developing countries begin to take some actions under this agreement and negotiate further commitments in a next round of negotiations.]

--Specific results for possible budget scenarios are presented in section II of this memorandum.

Attachment B: Suggested redraft of Section II(B)(1)

Agencies have developed options for domestic implementation programs with the following objectives in mind: (a) assuring that the U.S. will meet its emissions budgets under the agreement, (b) minimizing the true (social) cost of compliance, (c) minimizing price increases and wealth transfers above and beyond the true cost of compliance, and (d) cushioning effects on groups adversely affected by implementation.

Three possible program elements have been identified to serve these objectives: (1) flexible, market-based programs to create cap emissions and allow emissions trading, (2) policies and programs to encourage more rapid development and diffusion of cost-effective technologies to avoid or reduce emissions, and (3) policies and programs to provide transition assistance to adversely affected groups.

Each discussion below identifies both key substantive issues and key issues of process and timing.

1. What kinds of programs to limit greenhouse gas emissions should the administration support, and what process and timetable should be used to develop the details?

A. Background. All agencies agree that an emissions trading program should be a central part of our domestic climate change program. Under an emissions trading program, total allowable GHG emissions would be constrained ("capped") to the level permitted by the U.S. emissions budget under the agreement. Permits or "allowances" authorizing the emission of greenhouse gases would be distributed, either through an auction or allocation system. Trading of permits would allow firms to reduce the cost of compliance with the GHG budget. Firms or others required to have permits would have an incentive to take actions to reduce GHG emissions whose costs are relatively low, and to avoid actions with relatively higher costs.

Key issues in designing an emissions trading program include the following:

--What will be constrained or capped? Will the program directly cap *emissions* of greenhouse gases (especially CO₂), or will it be based on indirect approaches: e.g., constraining *fuel use* or the *carbon content of fuels*?

--To whom will the constraint apply? (I.e., who will be required to have permits or allowances to emit)? Primary fuel providers (coal, oil, and natural gas producers)? Refiners? Utilities and large industries? Home owners? Automobile companies? Motorists?

--To whom will the permits or allowances be distributed, and by what means? Should they be allocated to existing emitters or fuel providers ("grandfathered"), or allocated on the basis of other formulas? Should some or all of the permits be set aside to be "earned" by companies

who increase their production of competitively priced efficient goods (e.g., high mileage vehicles)? Should some or all of the permits be auctioned to the highest bidder? Some combination of the above?

--If auctioned, substantial revenues could be raised. Revenue reflow options include tax cuts to personal income, payroll or corporate taxes; deficit reduction; and support for transitional and technology programs.

--Some allocation approaches (e.g., grandfathering existing fuel providers or existing emitters) could lead to substantial windfalls. Other allocation approaches offer the potential to reduce or avoid windfalls.

--Comprehensiveness: Will all greenhouse gases be covered under the trading program or only some subset (e.g., CO₂ from fossil fuels, fluorinated chemicals and methane)? Policies and measures would need to be developed and implemented for managing the GHG emissions not subject to the "cap and trade" program.

--Minimizing social costs and avoiding unacceptable price increases and wealth transfers: Which program designs will most effectively motivate self-interested action to adopt high efficiency and low carbon alternatives? Which designs will most effectively avoid politically unacceptable price increases and wealth transfers?

B. Issue for Decision. All agencies believe some form of emissions cap-and-trade program as the cornerstone of the Administration's approach to domestic implementation. At this time, the key question is whether to announce support for such a program in the summer timeframe, and if so, with what degree of specificity and what process to engage stakeholders in further program development. Some agencies believe that key elements of program design should be decided quickly, to inform decisions on emissions budgets. Other agencies believe we should consult with domestic constituencies over the course of this calendar year before agreeing on key elements of program design. *[Note: EPA is not sure whether there is an agency that favors the former approach. (EPA does not.) If there is no proponent of option 1, then it should be dropped.]*

OPTION 1: Support a cap and trade program as an essential component of US domestic program and work to define details of a program for announcement this summer.

Pros:

Cons: i) Real analysis of the different impacts of alternative program designs has not been completed, and will be difficult to accomplish in the near term.

ii) Would be difficult to get meaningful feedback from constituencies before US

further defines its position on emissions budgets.

iii) Emissions trading raises a number of controversial political and legal issues (windfall profits, distribution of permits, is a permit a "right" to pollute). Working these through will take more time than we have before this summer or even before Kyoto.

OPTION 2: Support a cap and trade program; construct a small number of "strawman" program designs and initiate consultations with stakeholders.

Pros: Provides concrete illustrations of what program could look like; provides focus for detailed analysis and discussion, without locking administration into any single option.

Cons: See iii, above. While it is not necessary to fully resolve these issues in the context of offering a number of strawman options, the existence of strawmen may cause these issues to come to the fore more sharply.

OPTION 3: Support a cap and trade program as essential component of US domestic policy and initiate consultations with constituents without any strawmen designs.

Pros: Invites unfocused discussion.

Cons: Less than above, still an element of iii.

OPTION 4: Support flexible instruments for implementing domestic commitments; initiate consultations with constituents.

Pros: Less detail to shoot at.

Cons: Invites speculation that Administration is considering emissions taxes (the "other" economic instrument often advocated).

April 28, 1997

Jessicacc: JAF
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SS

FROM: Jessica Wasserman (202-482-2351)

3 Pages

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DOC/NOAA Comments on 4/23 Climate Change Predecisional
Draft/Memorandum for Deputies from Terry Garcia/Jessica Wasserman

General Points

1) The paper does not include enough discussion of the problem of developing country commitments. It is important to get Deputy level support now for an initiative to get developing countries on the Protocol. This issue should be included as an "Issue for Decision" on page 4.

B. Should the US support a Protocol that does not include new commitments from developing countries?

1. If US position is that some new developing country commitments are necessary, what level/type of commitments?

2. US willingness to do what it takes to get developing countries on board: e.g. intensify diplomatic efforts and fund GEF?

2) On page 5/last P of 2., it is confusing to condition any decision on the budget so strictly on trading and JI outcomes. We need to get Deputies to support a particular budget fairly soon and trading and JI remain uncertain (especially if we push large aspects of negotiating trading or JI off until after Kyoto). Better to emphasize that we know enough even without knowing outcome on trading and JI to make a decision about the budget. On page 3, 1990 levels in medium-term causes a 0.5-1.0% hit to GDP without factoring in trading or JI.

3) In the Background section, C. should be Macro-economic Modeling Analyses. There should be an additional section following along the lines of:

D. Sectoral Economic Analysis

1) Total US emissions are distributed roughly equally among industry, residential /commercial (buildings), and transportation.

2) Increased cost per household by geography

3) Increased cost per major industry

4) Effect on employment per industry

[We must have something rough on each of these]

Particular Points

1) Page 3 is a bit confusing as to when referencing domestic versus international trading and developed versus developing countries. Need to be very clear that:

a) As long as have domestic trading only impact on GDP is negative 0.5-1.0%. (first tick)

b) When also have international trading with developed countries (be clear that this is defined to include former SU and satellites as they are usually referred to as "emerging markets" or "economies in transition", not developed countries) then the GDP loss is reduced by 60% (loss of 0.5-1.0%). (third tick)

c) When also have international trading with both developed and developing countries then the GDP loss is reduced by 85% (loss of 0.5-1.0%). (Is it really true that including "developed" countries yields a 60% reduction whereas including developing countries in the trading system yields only an additional 25% reduction- maybe because former SU is being counted as "developed"?) (third tick)

2) Page 3, tick 4: Is it really true that the U.S. has the competitive advantage when it comes to emissions reductions? What if EU bubble? What if 1990 baseline changes?

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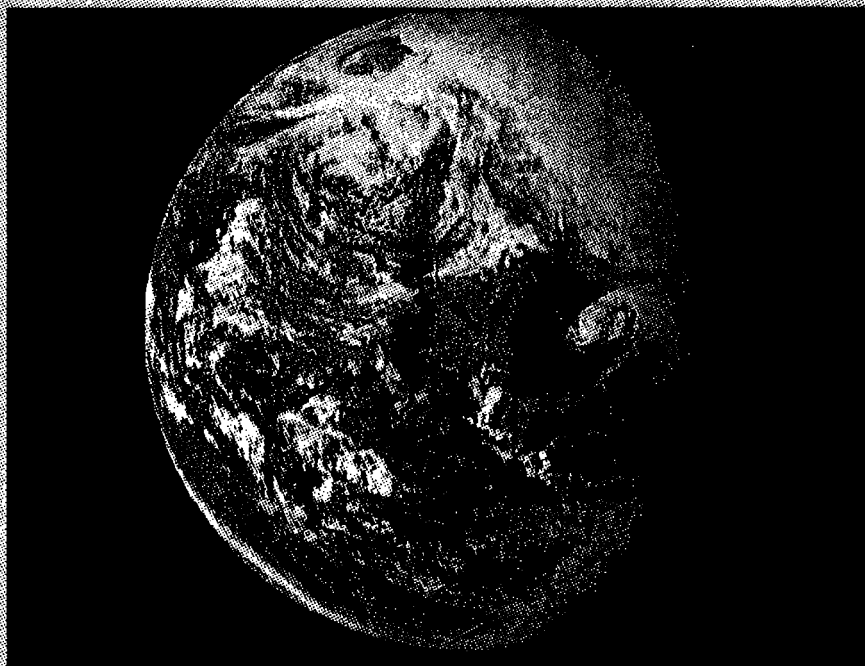
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Climate Change Deputies

Decision Memorandum



May 19, 1997