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DRAFT

Q: DO YOU BELIEVE THAT IT IS POSSIBLE TO MEET THE BINDING TARGET OF 1990 EMISSIONS LEVELS BY 2010 WITHOUT INFLICTING HEAVY COSTS ON THE ECONOMY?

A: I believe that the President's package of R&D initiatives, tax cuts for energy efficiency, Federal government energy initiatives, and the market-based permit trading system will be a solid first step in addressing the critical problem of global climate change. While the President is deeply committed to reducing carbon emissions, no one could reasonably expect that he -- or future administrations or Congresses -- would allow the costs of this effort to become extreme. That's why we have built in regular economic reviews, to monitor our progress and re-assess how the economy is responding. [SAFETY VALVE ALSO.]

After all, making predictions 10 or 15 years into the future is very difficult. We can not know with any precision how factors such as technological breakthroughs or successful international trading could lower the costs of addressing climate change.

Q: BUT DON'T MODELS SHOW THAT REACHING 1990 LEVELS BY 2010 WILL REQUIRE \$100 OR \$200 PER TON INCREASES IN CARBON PRICES?

A: There is no definitive answer as to how much it will cost to reach 1990 levels by 2010. Different economic models come up with different numbers based on different assumptions. Many published estimates are in the range that you mention. But as just one example of the uncertainties involved, full worldwide permit trading -- which admittedly may be difficult to implement -- has the potential to reduce costs substantially, to perhaps \$10 or \$20 per ton. If such a worldwide system of trading were to develop, the costs will thus be substantially lower.

In sum, there is substantial uncertainty surrounding how the economy will behave in 10 or 15 years. I must admit that 15 years ago, I never thought I would see an unemployment rate under 5 percent, a core inflation rate of under 2.5 percent, and a Federal budget deficit well under \$50 billion. But that's what's happened. So I would urge a similar degree of modesty here. The important point is that the President's plan is a solid first step in reducing carbon emissions without inflicting excessive costs on the economy.

Q: BUT DOESN'T YOUR OWN ANALYSIS SHOW THAT REACHING 1990 BY 2010 WOULD INVOLVE SUBSTANTIAL COSTS?

A: It seems inappropriate for me to reveal the analysis and views that I have shared with the President. I can say that I have informed him of the results from conventional economic models available in the public domain, and discussed both the benefits and limitations of such models. Given the importance I attach to frank internal discussions, I would prefer not to elaborate beyond that.

Q: HOW DO YOU DEFINE "EXCESSIVE" COSTS? IS \$50 PER TON EXCESSIVE?

A: [ANSWER DEPENDS ON SAFETY VALVE DECISION.]

Q: BUT WON'T THIS EFFORT CAUSE JOB LOSSES OF OVER 1.5 MILLION JOBS?

A: President Clinton's top priority, since his first days in office, has been revitalizing the economy, creating jobs and investing in people and technology to enhance long-term growth. And we have made tremendous progress: growth is strong, unemployment is down to 4.9 percent, and over 13 million jobs have been created since January 1993. He is not going to jeopardize that progress.

As for the specific impact of reducing carbon emissions to 1990 levels by 2010, I would emphasize once again that different economic models come up with different numbers based on different assumptions, and that there is substantial uncertainty involved in the estimates. Furthermore, no one could reasonably expect that this President -- or future administrations or Congresses -- would allow the costs of the effort to become extreme. That's why we have built in regular economic reviews, to monitor our progress and re-assess how the economy is responding. [SAFETY VALVE ALSO.]

Q: IF YOU DON'T KNOW HOW MUCH IT WILL COST TO REACH 1990 LEVELS BY 2010, HOW CAN YOU JUSTIFY GOING FORWARD WITH SUCH A POLICY?

As I have said, it is difficult to determine the exact cost of policies designed to reach 1990 emissions levels by 2010. Global climate change involves economic and physical processes that operate globally and over decades, if not centuries.

But the science is clear and compelling: we humans are changing the global climate. Over time, climate changes will disrupt agriculture, cause droughts and floods and the spread of infectious diseases. We must take steps now to reduce greenhouse gas emissions, and after carefully weighing the advantages and disadvantages of different approaches, the President has decided that reducing emissions to 1990 levels by 2010 is the best way forward.

The President's approach -- which starts with increased R&D spending, tax incentives for energy efficiency, and an aggressive effort on the Federal government's own energy efficiency -- recognizes the uncertainties involved in reducing carbon emissions. No one could reasonably expect that this President -- or future administrations or Congresses -- would allow the costs of the effort to become extreme. That's why we have built in regular economic reviews, to monitor our progress and re-assess how the economy is responding. [SAFETY VALVE ALSO.]

**PRELIMINARY AND INCOMPLETE: CLOSE HOLD
ECONOMIC Q&A**

October 20, 1997, 3:30pm

OVERVIEW

Q: WHAT IS THE ECONOMIC LOGIC OF THE PRESIDENT'S PLAN?

- A:
- As the President has emphasized, the risks posed by global climate change are real and sensible preventive steps are justified. This assessment accords with the views of the more than 2,500 economists -- including 8 Nobel laureates -- who signed a statement supporting measures to reduce the threat of climate change.
 - As Janet Yellen has stated, the effects of addressing climate change depend on whether we do it smart or we do it dumb. Doing it smart means using market mechanisms, recognizing the uncertainties involved, and avoiding all unnecessary costs in reaching our goal.
 - The President's three-stage program is therefore intended to ensure that we explore all possible avenues for low-cost carbon reductions. It includes a graduated, three-stage approach to reducing emissions, creates regular economic reviews, and emphasizes the importance of developing country participation in the global effort to address climate change.

Q: COULD YOU DESCRIBE THE THREE-STAGE PLAN IN MORE DETAIL, AND EXPLAIN HOW IT WORKS?

A: Yes:

- In the first stage, his package includes tax incentives and spending for R&D and energy efficiency, a set of Federal government energy initiatives, and industry-by-industry consultations to explore their best ideas on how to reduce emissions in a cost-effective manner.
- In the second stage, which would not take effect until 2005, the program introduces a trial market-based permit trading system for carbon emissions. Such a permit system is similar to, at least in concept, the one that currently applies to sulfur dioxide emissions -- although the scale of the carbon trading system would be significantly larger than the current sulfur dioxide program.
- Then, finally, in the third stage -- which would not take effect until [2008] and would continue through [2014] -- we would reduce emissions to 1990 levels. Before beginning this third stage, Congress and the President would review how

the economy had responded to the first two stages. And a critical component of this third stage is the inclusion of developing countries in an international system.

Q: HOW DOES THIS THREE-STAGE PLAN RECOGNIZE THE UNCERTAINTY INVOLVED IN CLIMATE CHANGE?

A: This three-stage program recognizes the uncertainty involved in the effort to address climate change in three ways:

- By adopting a graduated approach to emissions reductions, it allows us to grab the "low-hanging" fruit first.
- By adopting a system of regular economic reviews, to monitor our progress and re-assess how the economy is responding. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period.
- By insisting that the United States will not adopt binding obligations until developing countries make adequate commitments in terms of their own obligations, and that developing countries must be included in the international permit trading system. This allows the U.S. to take advantage of low-cost reduction possibilities abroad. As a letter signed by 2500 economists -- including 8 Nobel prize-winners -- argues, "In order for the world to achieve its climatic objectives at least cost, a cooperative approach among nations is required -- such as an international emissions trading agreement."

Q: HOW DOES THIS PLAN RELATE TO LESSONS LEARNED FROM ECONOMIC MODELS?

A: The economics literature on climate change suggests several lessons, including:

- Efforts to address climate change involve substantial uncertainties, in terms of both the economy and the environment;
- A "cap and trade" system in which emission permits are issued and then traded among firms can substantially reduce the cost of meeting an emissions target by creating incentives for emissions to be reduced by those firms and in those activities where costs are lowest;
- International emission permit trading ^{could} substantially lower ~~costs~~ costs by applying the same cost-minimizing principle globally; and *if it were successfully negotiated & implemented*
- Joint implementation, whereby US firms would receive credit for undertaking

emission reductions in countries with low abatement costs, would also lower the domestic burden. *if it worked as planned*

The President's plan reflects these crucial lessons:

- It reflects the underlying uncertainties involved by adopting a graduated approach to reducing emissions and instituting regular economic reviews.
- It includes a market-based emissions trading system that can substantially reduce costs relative to command-and-control approaches.
- It emphasizes international permit trading, and
- It conditions U.S. binding obligations on the participation of developing countries in the international system.

ECONOMIC COSTS OF CLIMATE CHANGE ITSELF

Q: WHAT ARE THE ECONOMIC COSTS OF CLIMATE CHANGE ITSELF? IS THERE AN ECONOMIC BENEFIT TO REDUCING CARBON EMISSIONS?

when?
A: Yes. Several prominent economists, including Bill Cline and Bill Nordhaus, have examined the economic impact of *not* acting at all. They study the costs of climate change in terms of agriculture, sea-level increases, life and morbidity, hurricane damage, and other factors. Their general conclusion is that the cost of allowing climate change to continue unabated could amount to losses of about 1 percent of GDP -- equivalent to about \$8 billion -- in the United States. [Nordhaus, *Managing the Global Commons*, Table 4.1; Cline, *The Economics of Global Warming*, Table 3.4.] Other analysts believe that the effects could be even larger.

[Note: By itself, reducing emissions to 1990 levels would not avert all -- or even most -- of the damages. So the partial benefit to reducing emissions to 1990 levels is *much* smaller than the figures listed above.]

TARGET AND TIMETABLE

Q: HOW DID YOU CHOOSE 1990 BY 2008 TO 2014, RATHER THAN ANY OTHER ALTERNATIVE?

A: The President carefully weighed a wide variety of different targets and timetables. Because of the multitude of economic, environmental, and diplomatic factors involved in each approach, this decision was very difficult. He decided that the best balancing of all these factors, and one that would represent a credible first step in addressing climate

change, would be to set a target and timetable of reducing emissions to 1990 levels by 2008 to 2014. That is the proposal we will be bringing to Kyoto. The President feels that his graduated approach strikes the proper balance between those who wish to do more, at the possible risk of imposing significant costs on the economy, and those who wish to do less, at the possible risk of imposing significant costs on the environment.

Q: HOW EXACTLY IS THE TIMETABLE MEASURED? WHAT DOES 2008 TO 2014 MEAN?

A: The proposal means that the objective is to reduce average greenhouse gas emissions between 2008 and 2014 to their level in 1990. In 1990, *net* U.S. emissions of all greenhouse gases -- CO₂, methane, nitrogen oxide, etc. -- amounted to 1.46 billion metric tons of carbon equivalent. Total CO₂ (carbon dioxide) emissions amounted to 1.34 billion metric tons, and *net* carbon dioxide emissions amounted to 1.23 billion of this total. (Net means gross emissions minus sinks, such as forests.)

[The U.S. position is that the international agreement should be stated in terms of total net emissions.]

Q: WHAT WILL U.S. EMISSIONS BE IN 2008-2014 UNDER BUSINESS-AS-USUAL? HOW ABOUT OTHER COUNTRIES?

A: We don't have a precise answer for 2008-2014, but we do have estimates for 2010 -- which is likely to be close to the average for 2008 to 2014. According to projections from DOE's Energy Information Administration, U.S. CO₂ emissions under business-as-usual are expected to increase from 1.34 billion metric tons in 1990 to 1.72 billion in 2010 -- an increase of 29 percent.

Western Europe CO₂ emissions are projected to rise from 1.02 billion metric tons in 1990 to 1.21 billion in 2010 -- an increase of 19 percent.

[Japanese emissions are expected to rise from 308 million metric tons to 466 million -- an increase of 51 percent. That estimate, however, does not fully reflect the recent slowdown in growth in Japan, and may therefore be substantially overstated.]

World emissions are expected to rise by 46 percent, from 6.0 billion metric tons in 1990 to 8.8 billion metric tons in 2010.

Q: WHY DID YOU CHOOSE A MULTI-YEAR TIMETABLE?

A: As press reports earlier this week indicated, carbon emissions often fluctuate significantly from year to year, based on economic growth, the weather, and other variables. The purpose of the multi-year timetable is to average over several years and thus minimize the

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impact of year-to-year fluctuations on meeting our international obligation.

Q: DOESN'T RESEARCH (BY MANNE AND RICHEL) SHOW THAT THE PRESIDENT'S TARGET AND TIMETABLE IMPOSES SUBSTANTIALLY HIGHER ECONOMIC COSTS FOR NO ADDITIONAL ENVIRONMENTAL BENEFIT, RELATIVE TO A MORE GRADUAL ADJUSTMENT PATH?

A: Some economic research does suggest that relative to the plan proposed by the President, a more backloaded approach to emissions reductions could reduce the costs involved, even while resulting in the same ultimate concentration of carbon in the atmosphere. But the emissions paths called for under such a plan rely on very steep -- and perhaps implausible -- declines in the out-years to ensure that the same concentration goal is met. [If we had proposed such a path, we would undoubtedly have been criticized for proposing a plan that was too backloaded.]

The President feels that his graduated, three-stage approach strikes the proper balance between those who wish to do more, at the possible risk of imposing significant costs on the economy, and those who wish to do less, at the possible risk of imposing significant costs on the environment.

GDP AND EMPLOYMENT

Q: WHAT IS THE EFFECT ON GDP?

- A:
- The precise effect on GDP is very difficult to assess. To provide some perspective: as you all know, it is difficult to gauge exactly what impact the balanced budget agreement will have on the U.S. economy's growth rate, levels of employment, interest rates and consumption over the next five years. But with global climate change, it is orders of magnitude more difficult to gauge the effects on the economy. Global climate change involves not just the next five years and not just the American economy, but, rather economic and physical processes that operate globally and over decades.
 - To reflect this uncertainty, the President has proposed a graduated, three-stage approach to emissions reductions -- starting with a period of voluntary action, tax incentives, R&D, and Federal efficiency improvements, and then followed by a trial permit trading system. He has also proposed regular economic reviews, to ensure that the economic costs are not excessive. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period.
 - President Clinton's top priority, since his first days in office, has been revitalizing the U.S. economy, creating jobs and investing in people and technology to

enhance long-term growth. We have made tremendous progress, and the President is not going to jeopardize that progress. Nor would we expect any future President or Congress to do so.

- As for specific estimates of the impact on GDP -- which again are highly uncertain -- I would emphasize that two key components of the President's plan are that developing countries adopt binding targets and participate in an international permit trading system. As 2500 economists -- including 8 Nobel prize-winners -- have argued, "In order for the world to achieve its climatic objectives at least cost, a cooperative approach among nations is required -- such as an international emissions trading agreement."
- With these two components -- developing country participation and international trading -- economic analysis suggests that the effect on GDP is likely to be minimal -- and much less than the typical variation in growth from quarter to quarter or year to year. [With worldwide trading, economic models suggest that the effect on GDP in 2010 is likely to amount to less than 0.1 percent of GDP.]

FOLLOW: BUT DON'T SOME MODELS SHOW DECLINES IN GDP OF 1 TO 2 PERCENT? IS THAT "MINIMAL"?

A: Some models do indeed show declines of those amounts, but they ignore several key issues:

- First, there is much uncertainty over cost projections that are 13 or more years into the future -- 13 years ago, we could never have predicted that we would now have an unemployment rate below 5 percent, core inflation below 2.5 percent, and a budget deficit substantially under \$50 billion.
- Second, to reflect the uncertainty involved in addressing climate change, the President has proposed a graduated, three-stage approach to emissions reductions -- starting with a period of voluntary action, tax incentives, R&D, and Federal efficiency improvements, and then followed by a trial permit trading system. He has also proposed regular economic reviews, to ensure that the economic costs are not excessive. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period.
- Third, most models ignore the economic costs associated with climate change itself -- increased flooding, sea-level rise, and other dislocation. So looking just at the impact of reducing emissions on GDP is misleading.
- Finally, those estimates are based on model runs that assume that developing countries do *not* adopt binding targets and that there is no international permit

trading -- even though both are key components of the President's plan. When those components are included in the analysis, the effects on GDP are predicted to be substantially lower. [With worldwide trading, economic models suggest that the effect on GDP in 2010 is likely to amount to about 0.1 percent of GDP.]

Q: WHAT IS THE EFFECT ON OVERALL EMPLOYMENT?

A: Same as answer to GDP question above, but substituting "employment" for "GDP." [With worldwide trading, the effect on employment is likely to be about 75,000 jobs -- about one-third the average *monthly* job creation since President Clinton took office.]

Q: DIDN'T AN EPI REPORT SHOW THAT OVERALL EMPLOYMENT WOULD FALL BY MORE THAN 1.5 MILLION UNDER THE PRESIDENT'S PLAN?

A: No. The EPI report assumed no international trading and no developing country participation -- key components of the President's plan. Other results suggest that such omissions produce grossly misleading results. The President's plan also includes regular economic reviews, precisely to ensure that the economic costs are not excessive.

After all, President Clinton's top priority, since his first days in office, has been revitalizing the economy, creating jobs and investing in people and technology to enhance long-term growth. And we have made tremendous progress: growth is strong, unemployment is down to 4.9 percent, and over 13 million jobs have been created since January 1993. He is not going to jeopardize that progress.

Q: WHAT ABOUT EMPLOYMENT IN SPECIFIC SECTORS?

A: President Clinton's top priority, since his first days in office, has been revitalizing the economy, creating jobs and investing in people and technology to enhance long-term growth. And we have made tremendous progress: growth is strong, unemployment is down to 4.9 percent, and over 13 million jobs have been created since January 1993. He is not going to jeopardize that progress.

As the President has emphasized, the risks posed by global climate change are real and sensible preventive steps are justified. It is likely that in the effort to address this substantial challenge, some sectors will gain and some will lose. The regular economic reviews that are a critical part of the President's plan, and his commitment to developing a system of transition assistance for any affected workers, are intended to minimize any costs.

FOLLOW: WHICH SPECIFIC SECTORS WILL BE HURT?

[A: We would expect that the impact would be more significant in carbon-intensive and

energy-intensive sectors. But we do not have precise modeling results, showing which industries will gain and which will be hurt. I should note, however, that the President has expressed his commitment to working with interested parties to develop a system of transition assistance, to reduce the burden on workers in affected industries.]

PERMIT PRICES AND ENERGY PRICE INCREASES

Q: DON'T MOST MODELS SUGGEST THAT CARBON PRICES WILL HAVE TO RISE BY \$100 TO \$200 PER TON TO REDUCE EMISSIONS TO 1990 LEVELS BY 2010?

A: Many models have concluded that permit prices would need to be in that range to reduce emissions to 1990 levels by 2010 with no international trading. But such trading, including with developing countries, is a key component of the President's plan. The economics literature suggests that if international trading were to develop, the costs involved would be substantially reduced.

I should also note that there is much uncertainty over cost projections that are 13 or more years into the future -- 13 years ago, we could never have predicted that we would now have an unemployment rate below 5 percent, core inflation below 2.5 percent, and a budget deficit substantially under \$50 billion.

To reflect the uncertainty involved in addressing climate change, the President has proposed a graduated, three-stage approach to emissions reductions -- starting with a period of voluntary action, tax incentives, R&D, and Federal efficiency improvements, and then followed by a trial permit trading system. He has also proposed regular economic reviews, to ensure that the economic costs are not excessive. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period.

FOLLOW: HOW MUCH OF A DIFFERENCE DOES INTERNATIONAL TRADING REALLY MAKE?

- A:**
- I hesitate to give a precise answer because of the substantial uncertainties involved in the analytical effort, and because of the institutional difficulties in making international trading a reality. But many reports suggest that international trading *could* substantially reduce the cost.
 - The World Bank is already working on designing a system for international trade in permits. Some experiments have already been conducted -- including one in the Nordic countries that suggested that international trading "can be an important means of reducing the costs to achieve a greenhouse gas objective." [Peter Bohm, "A Joint Implementation as Emission Quota Trade: An Experiment Among Four

Nordic Countries," Nordic Council of Ministers, February 7, 1997.]

- Over 2500 economists -- including 8 Nobel prize-winners -- have signed a letter emphasizing that "In order for the world to achieve its climatic objectives at least cost, a cooperative approach among nations is required -- such as an international emissions trading agreement."
- A recent report written by several leading climate change economists and published by the Pacific Northwest National Laboratory this month suggests that worldwide permit trading would allow us to reach 1990 levels by 2010 for a permit price of approximately \$25 per ton in 2010 -- or an increase of about 6 cents per gallon of gasoline after 13 years. [JA Edmonds, SH Kim, CN MacCracken, RD Sands, MA Wise, "Return to 1990: The Cost of Mitigating United States Carbon Emissions in the Post-2000 Period," Battelle, October 1997.]

Q: DIDN'T THE 5-LABS STUDY CONCLUDE THAT CARBON PRICES WOULD HAVE TO RISE BY \$50 TO REACH 1990 LEVELS BY 2010, AND ISN'T THAT ON THE OPTIMISTIC SIDE?

A: The 5-Labs study examined a scenario in which there was no international trading, and concluded that the permit price would have to be \$50 to reduce emissions to 1990 levels by 2010 with no such trading. But the President's plan emphasizes international trading, including with developing countries, and the economics literature suggests that worldwide trading substantially reduces the costs involved.

[The Department of Energy has released an analysis that combines international permit trading with the results of the 5-Labs study, and concluded that a permit price of \$25 or lower in 2010 would allow the country to meet its target and timetable.]

Q: ISN'T \$25 PER TON OF CARBON STILL A SUBSTANTIAL INCREASE IN ENERGY COSTS?

A: As the President has emphasized, the risks posed by global climate change are real and sensible preventive steps are justified. Some increase in the relative price of energy is necessary to address climate change. Under the President's plan, any relative price shifts involved would not take effect until 2005 or later.

[Note: \$25 per ton translates into about 6 cents per gallon of gasoline, and approximately \$200 per year for the average family.]

Q: DON'T SOME ADS SUGGEST THAT GAS PRICES WOULD HAVE TO RISE BY 50 CENTS?

A: Those ads are misleading. They seem to be based on especially pessimistic views about what could happen if we attempted to reduce emissions to 1990 levels without international trading. But such trading, including with developing countries, is a key component of the President's plan. Since the economics literature suggests that worldwide trading substantially reduces the costs involved, those ads are misleading.

CREDIBILITY

Q: HOW CAN YOU POSSIBLY REDUCE EMISSIONS TO 1990 LEVELS BY [2010] WITHOUT IMPOSING EXCESSIVE COSTS ON THE ECONOMY?

- A:
- Climate change is a critical challenge facing the country, but there is substantial uncertainty surrounding how costly it will be to address. Given this uncertainty, it would be irresponsible not to explore all possible avenues for low-cost emissions reductions before undertaking any effort that would be excessively costly.
 - The President's graduated, three-stage approach therefore recognizes that there is substantial uncertainty over any project that is 13 or more years into the future -- 13 years ago, we could never have predicted that we would now have an unemployment rate below 5 percent, core inflation below 2.5 percent, and a budget deficit substantially under \$50 billion.
 - To reflect the uncertainty involved in addressing climate change, the President has proposed a graduated, three-stage approach to emissions reductions -- starting with a period of voluntary action, tax incentives, R&D, and Federal efficiency improvements, and then followed by a trial permit trading system. He has also proposed regular economic reviews, to ensure that the economic costs are not excessive. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period.
 - I don't know for sure that we can succeed in this effort, but I'll tell you one thing: After the first two stages of the President's program, we will have made a credible first step and we'll know a lot more than we do now about both the science and economics of climate change.

SAFETY VALVE, ECONOMIC REVIEWS, AND "BINDING" TARGET

Q: IS THE TARGET AND TIMETABLE BINDING?

A: Yes, but it would not be reasonable to expect this President, or any future President or

Congress, to impose excessive costs on the economy to meet that target.

Q: THEN HOW CAN YOU CLAIM THAT THE TARGET AND TIMETABLE IS BINDING, WHEN MOST ECONOMIC MODELS SUGGEST THAT YOU CAN'T REDUCE EMISSIONS THAT MUCH WITHOUT INCURRING EXCESSIVE COSTS?

- A:
- First, there is much uncertainty over any cost projections that are 13 or more years into the future -- 13 years ago, we could never have predicted that we would now have an unemployment rate below 5 percent, core inflation below 2.5 percent, and a budget deficit substantially under \$50 billion.
 - Second, the models to which you refer assume no worldwide permit trading. But such trading, including with developing countries, is a key component of the President's plan. The economics literature suggests that worldwide trading substantially reduces the costs involved.
 - Finally, all we are saying is that it is unreasonable to ignore the reality that future Congresses will always have the option to protect the economy or to undertake more environmental action. We should therefore recognize that decisions about whether the United States was willing to bear the costs that could be necessary to meet the target and timetable goal will, in a sense, have to be made at that time.

Q: HOW CAN YOU ENSURE THAT THE COSTS ARE NOT EXCESSIVE?

- To ensure that the costs are not excessive, the President has proposed a graduated, three-stage approach to emissions reductions -- starting with a period of voluntary action, tax incentives, R&D, and Federal efficiency improvements, and then followed by a trial permit trading system. He has also proposed regular economic reviews, precisely to ensure that the economic costs are not excessive. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period.
- The President has also emphasized the participation of developing countries, and an international system of trading permits, as key components of his climate change plan. Such factors should substantially reduce the costs involved.

Q: WILL THESE REVIEWS FORM PART OF THE INTERNATIONAL TREATY?

- A:
- No, although the treaty already includes broad language that preserves a country's right to take protective action if the costs involved become excessive.

Q: HOW CAN YOU SIGN AN INTERNATIONAL TREATY THAT DOESN'T REFLECT THE PROTECTIONS YOU ARE CLAIMING DOMESTICALLY?

A: No country would ever be expected to sacrifice its national interests -- including either its national security or its economic well-being -- on the basis of an international treaty. So let me put it this way: We would be just as committed to this treaty, if we get an adequate agreement, as any other we have ever adopted.

Q: DOES YOUR PROPOSAL INCLUDE A "SAFETY VALVE"?

A: That term has unfortunately become a bit maligned. Our proposal includes a variety of mechanisms to ensure that the economic costs involved are not excessive -- including the graduated, three-step approach with regular economic reviews and the commitment to an international trading regime. You can call them what you want.

Q: DIDN'T THE ADMINISTRATION PROPOSE A "SAFETY VALVE" INVOLVING A MAXIMUM PERMIT PRICE?

A: The issue of whether it would make sense to impose a ceiling on the permit price in the internationally binding period (Stage 3) has been raised by researchers at Resources for the Future, and was discussed during the President's climate change conference.

FOLLOW: WHY DIDN'T THE ADMINISTRATION ADOPT SUCH AN APPROACH?

A: We felt it was unnecessary to impose a formal ceiling price during the internationally binding period at this time. We are confident that our graduated approach, with its regular economic reviews and scope for adjustments by future Presidents and Congresses, provides sufficient protection against excessive economic costs.

Q: WHO WILL CONDUCT THE ECONOMIC REVIEWS?

A: The reviews will be conducted by relevant experts and officials. It is possible that we would form a commission to conduct them.

Q: WHAT IMPACT WILL THE REVIEWS HAVE ON POLICY?

A: The reviews will help to ensure that policy-makers, both in the Administration and in Congress, have the best possible information on how the economy is responding to the effort to address climate change, how other countries are performing relative to their own commitments, and how the climate is changing in response to human activities. That information will then undoubtedly be used to make any adjustments that seem appropriate to policy-makers in the future. It doesn't seem wise for me to speculate about what form such adjustments would take -- whether in terms of more aggressive

environmental action, or less aggressive.

STANDARDS

Q: ARE YOU PROPOSING ANY INCREASE IN CAFE STANDARDS TO IMPROVE FUEL EFFICIENCY AND REDUCE EMISSIONS?

A: In the DOT appropriations bill that was just passed and signed into law, Congress precluded any change in CAFE standards for FY 1998. So we do not currently have the authority to change CAFE standards.

Q: ARE YOU PROPOSING ANY OTHER STANDARDS AS PART OF YOUR PACKAGE?

A: [Wait for DOE input. Building codes.]

TAX INCREASES

Q: DOESN'T THE PRESIDENT'S PLAN AMOUNT TO THE LARGEST ENERGY TAX INCREASE IN HISTORY -- \$200 BILLION A YEAR OR MORE?

A: Not at all. The President's plan includes tax *cuts*, not tax increases. It does not involve tax increases at all.

FOLLOW: BUT ISN'T A PERMIT SYSTEM JUST LIKE A TAX?

A: No. There are several critical differences between a permit system and a tax. For example, a permit system provides insurance that a given quantitative target will be met, whereas a tax does not.

FOLLOW: BUT IF YOU AUCTION THE PERMITS, ISN'T THAT A TAX?

A: First, we have not decided to auction the permits. Second, just for the record, there are still several critical differences between such an auctioned permit system and a tax. For example, the permit system provides insurance that a given quantitative target will be met, whereas a tax does not. And any revenue from the auctions could be used to *reduce* other taxes -- so that the entire effort would be revenue-neutral.

Q: WON'T ENERGY PRICES INCREASE, JUST AS IF YOU IMPOSED A TAX?

A: Climate change is a critical issue, and some increase in the relative price of energy will ultimately be necessary to address it. But it would be irresponsible not to explore all possible alternatives before resorting to moderate relative price change. The President

has therefore proposed a graduated, three-stage approach to emissions reductions -- starting with a period of voluntary action, tax incentives, R&D, and Federal efficiency improvements, and then followed by a trial permit trading system. He has also proposed regular economic reviews, to ensure that the costs are not excessive. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period. The President has also emphasized the participation of developing countries, and an international system of trading permits, as key components of his climate change plan. Such factors should substantially reduce the costs involved.

Q: HOW DOES THIS EFFORT COMPARE TO THE BTU TAX?

A: This effort is not a tax, so it is not directly comparable. And energy price increases would not occur for eight years or more -- in 2005 or later. But in terms of oil prices, the effect of a \$25 carbon permit price is approximately the same. Remember, however, that the increase would not occur until 2005.

[A \$25 permit price is equivalent to approximately 60 to 70 cents per million BTUs. In 1993, the Administration proposed a tax of 26 cents per million BTUs plus a 34 cents per million BTUs tax on oil.]

DETAILS OF PERMIT SYSTEM, INCLUDING GRANDFATHERING VERSUS AUCTIONING

Q: HAVE YOU DECIDED WHETHER THE PERMITS WOULD BE AUCTIONED OR GRANDFATHERED?

A: No. That is a very important issue that we will explore with Congress and other interested parties when the time comes for developing domestic implementation legislation.

Q: WHERE WOULD THE PERMIT REQUIREMENTS BE IMPOSED?

A: That is a very important issue that we will explore with Congress and other interested parties when the time comes for developing domestic implementation legislation.

COMPETITIVENESS

Q: WON'T THIS PLAN LEAD TO MASSIVE SHIFTS OF U.S. INDUSTRY AND JOBS ABROAD?

A: • No. The President has made very clear that we will not assume binding obligations until the developing countries make adequate commitments in terms

of their own obligations.

- I would also note that non-tradeable sectors account for a substantial share of carbon emissions. Transportation and buildings, for example, account for roughly two-thirds of U.S. emissions. For these sectors, the “competitiveness” argument seems largely irrelevant.
- In most manufacturing sectors, furthermore, energy costs are a small percentage of total costs. According to the 1995 Annual Census of Manufactures, energy costs for manufacturing industries averaged just 2.2 percent of total costs.

DEVELOPING COUNTRIES AND INTERNATIONAL TRADING

Q: WHAT SPECIFIC MODELS SHOW THAT WORLDWIDE INTERNATIONAL TRADING ALLOWS RELATIVELY LOW-COST REDUCTIONS?

- A:
- According to JA Edmonds, SH Kim, CN MacCracken, RD Sands, MA Wise, “Return to 1990: The Cost of Mitigating United States Carbon Emissions in the Post-2000 Period,” Battelle, October 1997, the cost of reaching 1990 levels by 2010 with worldwide trading would be a permit price of \$26 per ton in 2010.
 - The models used by the Interagency Analytical Team to produce its draft report suggest that the permit price needed to reduce emissions to 1990 levels by 2010 would be between \$9 and \$20 in 2010.

Q: DOESN'T INTERNATIONAL TRADING MEAN THAT WE ARE ESCAPING OUR OBLIGATION TO REDUCE EMISSIONS?

- A: No. A ton of carbon emitted from Argentina is just as damaging to the global climate system as a ton of carbon emitted from the United States. So we are contributing just as much to the effort to address global climate change if we facilitate reductions abroad as if we reduce here. The U.S. position has therefore always emphasized the efficiency of allowing least-cost reductions wherever they occur in the world.

Q: WON'T INTERNATIONAL TRADING MEAN THAT WE ARE SENDING BILLIONS OF DOLLARS ABROAD, AND EXPANDING OUT TRADE DEFICIT?

- A: First, it is difficult to predict precisely how large the trade in these permits will be. Second, the estimates we do have suggest that such trade could amount to a few billion dollars a year -- a relatively modest amount. Third, our balance of payments statisticians have not determined whether such trade would show up in the trade deficit at all, or would be more appropriately handled in other parts of the balance of payments (e.g.,

other elements of the current account, or within the capital account). Finally, our oil imports should decline as a result of efforts to address climate change. Some estimates suggest that our trade deficit could therefore *narrow* as a result of the effort.

Q: IS INTERNATIONAL TRADING REALLY FEASIBLE, ESPECIALLY WITH DEVELOPING COUNTRIES?

- A:
- Creating a system of international trading will undoubtedly be a challenge for the United States and other parties to any climate change treaty. But the President is firmly committed to the concept, because it is an efficient, market-based approach to emissions reductions -- it substantially reduces the costs of meeting our target.
 - The World Bank has already begun work on how such an international trading system could function.
 - And some carbon trades are already occurring under our pilot Joint Implementation program.

Q: HOW CAN WE EXPECT COUNTRIES LIKE INDIA AND CHINA TO PARTICIPATE IN AN INTERNATIONAL TRADING REGIME?

- A: Such countries already participate in international trade in other products. The President has made clear that we will not adopt binding obligations until the developing countries make adequate commitments in terms of their own obligations. And once they have made such commitments, there is no reason to suspect that they would be unwilling to be guided by economic incentives in deciding whether to sell carbon emissions permits on an international market.

PROCESS ON ECONOMIC MODELLING AND ECONOMIC ANALYSIS

Q: WHAT ECONOMIC ANALYSIS AND MODELS DID YOU USE IN EVALUATING DIFFERENT POLICIES?

- A: We relied on a wide variety of published analyses and outside experts, as well as the professional judgment of the Administration's top economists. Given the uncertainties involved, it would have been imprudent to rely on one single model or set of models. So we wound up relying on a large number of analyses and views -- including the results from the Energy Modeling Forum at Stanford University, the Intergovernmental Panel on Climate Change, and others.

Q: WHAT IS THE INTERAGENCY ANALYTICAL TEAM? DOES ITS REPORT REFLECT THE ADMINISTRATION'S OFFICIAL ECONOMIC ANALYSIS?

- A:
- When the Administration evaluates possible policies, it normally sets up a variety of staff-level working groups to inform the principals' discussions. The Interagency Analytical Team (IAT) was one such group -- an informal group of modelers from various agencies in the Federal government.
 - Once the relevant principals within the Administration looked over the staff work and the peer review comments on it, it was decided that further activity would be futile because of the difficulty of developing a model or set of models that can give us a definitive answer as to the economic impacts of a given climate change policy. So the IAT report is *not* the Administration's official economic analysis on this issue.
 - The working group's draft report, which was released on July 15, summarizes the preliminary results of the modeling effort. That modeling effort produced some useful lessons, but -- as illustrated by comments from peer reviewers -- it also suffered from shortcomings.
 - As Janet Yellen emphasized in her testimony on July 15, the lessons and the shortcomings of the exercise point to one clear conclusion: the effort to develop a model or set of models that can give us a definitive answer on the precise economic impact of a given climate change policy is futile. Rather, we are left with a set of parameters and relationships that influence estimates of the impacts. As she indicated, it is more productive to employ a broad set of economic tools to analyze policy options than to seek to develop a single definitive model. So that's what we did.

ECONOMIC TEAM RUMORS

Q: ISN'T IT TRUE THAT THE ECONOMIC TEAM OBJECTED TO THE PRESIDENT'S CHOICE OF EMISSIONS REDUCTIONS?

A: I'm sure that you can understand that the advice given by any Administration officials to the President must remain confidential. But I can assure you that the economic team supports the President's package, especially its emphasis on a market-based approach and on international trading.

Q: BUT DOESN'T YOUR OWN ANALYSIS SHOW THAT REACHING 1990 BY 2010 WOULD INVOLVE SUBSTANTIAL COSTS?

A: It seems inappropriate for me to reveal the analysis and views that I have shared with the President. I can say that I have informed him of the results from conventional economic models available in the public domain, and discussed both the benefits and limitations of such models. Given the importance I attach to frank internal discussions,

I would prefer not to elaborate beyond that -- except to note once again, that there is much uncertainty involved in the estimates and that worldwide international trading, a key component of the President's plan, reduces the costs involved significantly.

COMPONENTS OF STAGE 1

Q: WHAT DOES STAGE 1 OF THE PRESIDENT'S PLAN ENTAIL?

A: The first stage, which applies until 2005, includes:

- **\$5 billion for tax cuts and R&D:** A package of carbon-reducing tax incentives and other programs amounting to \$5 billion over 5 years. For example, the package may include tax credits for carbon-saving technologies such as renewable energy sources.
- **Federal energy efficiency improvement:** A Federal government energy efficiency initiative is being developed by the Department of Energy, in conjunction with the Department of Defense and other relevant agencies. It includes expanding the use of Energy Savings Performance Contracts, reinventing federal procurement, taking a "sustainable design" approach to federal facilities, and developing more efficient military propulsion systems. The effort would also include a review of existing Executive Orders on purchases, preparation of a new Executive Order to fill any gaps, a directive to federal agencies to prepare greenhouse gas reductions plans and a requirement that all federal agencies assess the greenhouse gas impacts of major federal actions.
- **Industry-by-industry consultation:** We will encourage businesses, on an industry by industry basis, to prepare plans for reductions that they believe they could achieve on their own and how they could best achieve them. Each relevant industry would prepare a plan over the next 6-12 months.
- **Credit for early action:** The President and Vice President strongly support appropriate rewards for those who promptly take early action to reduce emissions. The details of how such an early credit system would operate, however, are complex and can't be fully articulated until the details of an overall permit trading system are worked out. We should state our support for early action and indicate that early actors will be appropriately rewarded.
- **Electricity restructuring:** The President has announced his support for restructuring the electricity industry, which -- if done properly -- could help to reduce carbon emissions, save consumers billions of dollars, and improve the efficiency of our economy.

- **Transition Assistance.** We will work cooperatively with labor and Congress to insure that we give proper assistance to any workers who are dislocated by the changes in energy usage inherent in any climate change plan.

Q: WHAT ARE THE PAY-FORS ON THE \$5 BILLION IN TAX INCENTIVES AND R&D?

A: We will be developing the detail of that package as part of the FY 1999 budget process. The proposals will clearly be fully paid for, but we are still working out the details of what will be included in the package itself. It doesn't make sense to identify precisely the pay-fors before identifying the items themselves.

Q: WHAT IS THE SHARE OF TAX CUTS IN THE \$5 BILLION?

A: That will be decided as part of the FY 1999 budget process.

Q: HOW MUCH DO WE CURRENTLY SPEND ON ACTIVITIES LIKE THIS?

A: [CHECK WITH CLIMATE CHANGE TASK FORCE.]

COMPONENTS OF STAGE 2

Q: WHAT DOES STAGE 2 OF THE PRESIDENT'S PLAN ENTAIL?

A: In stage 2, which begins in 2005, the emissions trading system would begin as a trial project that would allow us to learn how the system operates before entering the period in which our binding international obligations would hold. **[ADD MORE DETAIL HERE.]**

ELECTRICITY RESTRUCTURING

Q: WHAT EFFECT DOES ELECTRICITY RESTRUCTURING HAVE ON CARBON EMISSIONS?

A: If done properly, electricity restructuring has the potential to reduce carbon emissions by rewarding pursuit of greater efficiency in the generation and use of electricity. According to conservative estimates, restructuring could save U.S. residential and industrial consumers \$20 billion per year. A well-crafted restructuring package could also produce significant carbon emissions reductions. As we heard at the President's climate change conference, we currently waste two-thirds of the energy used to produce electricity -- and restructuring could help to reduce that waste. Other potential elements of a restructuring package, including a renewables portfolio standard and green labeling, could also reduce carbon emissions.

Q: WHAT IS THE PRESIDENT'S PLAN FOR ELECTRICITY RESTRUCTURING? WHEN WILL THE DETAILS BE AVAILABLE?

A: We will be refining our own thinking on this issue over the coming months, and look forward to working with all interested parties to ensure that we can craft a restructuring package that saves American consumers money and is good for the environment.



Joseph E. Aldy
12/08/97 11:29:41 AM

Record Type: Record

To: Janet L. Yellen/CEA/EOP, Jeffrey A. Frankel/CEA/EOP, Adele C. Morris/CEA/EOP, Randall W. Lutter/CEA/EOP

cc:
Subject: GCC: unbelievable bna report

U.S. may give up developing country requirement in Kyoto. See below.

----- Forwarded by Joseph E. Aldy/CEA/EOP on 12/08/97 11:30 AM -----



JRamses @ UWyo.Edu
12/08/97 11:21:00 AM

Record Type: Record

To: Joseph E. Aldy
cc:
Subject: unbelievable bna report

Gore Hints of U.S. Acceptance if Separate
Pacts Reached With Developing Countries

KYOTO, Japan--Vice President Gore Dec. 8 left open the possibility that the Clinton administration would accept a new climate change treaty if it contained all the elements it wants save one--action by developing countries.

If the new pact has the provisions the administration wants--and if the United States hammers out side agreements on greenhouse gas emission reductions with key developing countries such as China--the administration might send the treaty to the Senate for advice and consent to ratification, Gore suggested.

Such a scenario might spark "a real knock-down, drag-out debate that would be great for the country," the vice president told reporters. "I think it'd be a lot of fun. I would look forward to it. But we're not there yet."

Gore reaffirmed the Clinton administration stance that for the U.S. to accept a new climate change treaty under negotiation here, large developing countries will have to agree in some format to limit their greenhouse gas emissions.

"We've said from the beginning that we have to have meaningful participation by key developing countries" in the new treaty that negotiators hope to finish by Dec. 10, Gore told reporters. "If we don't get that, it won't meet our conditions" for agreeing to be bound by greenhouse gas emission limits in the pact, he said.

When asked what would constitute "meaningful participation," Gore replied,

"We'll know it when we see it, and if we see it, we hope the Senate will see it."

The Senate must give its advice and consent to ratification of the accord before the United States would be bound by it.

Congressional Reaction.

Senate and House observer delegations here also emphasized that the Kyoto accord should include participation by developing countries in limiting greenhouse gas emissions. However, legislators were divided on what the form of those commitments should be, although they agreed that China has to be involved.

Sen. Joseph Lieberman (D-Conn) said, "China has to be part of this." He noted that China is the world's second largest emitter of greenhouse gas emissions after the United States.

Rep. Jim Sensenbrenner (R-Wis), head of the House delegation and chairman of the House Science Committee, said, "The vice president missed a golden opportunity today to make clear that the Clinton-Gore administration will not sign any treaty that does not include China, India, Mexico, Brazil, and every other country in the world." He told reporters that a climate change accord without emission limitation action by the 134

developing countries "does not
pass the smell test."

Sensenbrenner said he would find the treaty more
palatable if the larger
emitters of the developing world "had some legally
binding goals" that were "not
as severe" as goals for the industrialized countries.

Lieberman said, "We can't get this ratified by the
Senate until [developing
countries] do something." He agreed with earlier
observations by Republican
senators that the expected new treaty would not meet
the criteria of S Res 98.

The resolution, which the Senate passed last July on a
95-0 vote, declared that
the Senate will not support a climate pact that does
not include developing
countries, or that would cause harm to the U.S. economy
(144 DEN AA-1,
7/28/97).

Sen. John Kerry (D-Mass) said the Senate would reject
any agreement with "a
permissiveness that permits the richer developing
countries to reach the U.S.
level" of greenhouse gas emissions "and then negotiate"
an emission control
strategy. Developing countries must accept that they
"are part of the solution"
to climate change, he said, adding that there is no
intent to deprive these
nations of economic growth.

Gore said although S Res 98 and the Clinton
administration use different
terminology for developing country involvement, they
hold a common position.

"We share with them the view that developing countries
that are meaningfully
contributing to the problem [of climate change] have to
meaningfully contribute
to the solution," Gore said.

By Cheryl Hogue

EMF

Modeling Kyoto

Timing

scenarios with 1 wk. or 2
modelers' choice. calibrate
not going to standardize

middle of May mtg. in D.C.

Sun

Aug 10-11

^{2nd} Simulations wk.

(Kyoto mtg.)

Th.-Fri. Starts

costs

~~WTO~~ GCC

2/26/48

Sancton

W/M (conf. reqs)

LDLS

Rafe

V.P

S. A., India, China.

(copying by range basis)

Article 10 mandate

non Annex B.

How would a new entity

Alt.

• Amendment to Protocol require $\frac{3}{4}$ countries to approve

or • Amend Article X.

Argument seems to support this

when Buenos Aires? or COP 5 - could take 2 yrs.

or neg. mandate for another round. Some Axis states have raised,

quantitative target for reasonably

process & identify 10

Analytical work with types of limit system (us)

Strategy in Article 10 at start

Trade

E Trade (int.)

need users perspective on trade ERT paper

to inform public about trade. to inform ourselves, US, other countries.

How int. trade would work

Buenos Aires = what to we want?

Detailed set of requirements.
SMA has asked for, for Nanbend

GCC

2/26/98

CDM

Raff paper for S.E. on objectives for CDM.
verification bds. ? additionality?
who do it

Sinks

Adelle were preparing a paper on CDMs ^{objectivity} ~~terminology~~
with Bill H.

Have in a wk.

Forest & land use.

IFIs

Treas

Helmut Wolf, Tommy

Clean Gr. Initiative

shadow costs
targets for renewables

Harmonized...

[+ fossil fuel subsidies]

Environment + Compliance

(costs)

only 1 model.

uncertainty for $G^3...$

Factors we varied

Benefits

Agenda
~~models and~~

Costs: How low can they go with trading?

Benefits
sens. for
sinks other models

Techn. AEE

How to close the gap?

Electr. restr.

CC mitigation

7. of reduction done in U.S.
\$ value of market

Effect on prices

Office of Economic Policy

Department of the Treasury
Washington, D.C. 20220

FAX

Date: 12-30-97

Number of pages including cover sheet: 4

	Name	Fax Number	Phone Number
To:	Jeff Frankel	395-6958	
	Joe Alder	395-6870	
	Randy Hutter	395-6870	
From:	Jon Gubler	202-622-2633	

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

12/30/97

Memo To: Jeff Frankel
Joe Aldy
Randy Lutter
Ray Squitieri

From: Jon Gruber

Re: Cost and Benefit estimates for Kyoto agreement

Here is the latest version of the various permutations that we would like to see on costs and benefits. Joe is basically in charge of costs, with Randy & Ray working on benefits - although Joe will have to be involved with the last benefit, revenue recycling.

We are working towards a meeting with Larry and Janet on Monday, so we should probably plan to discuss results tomorrow or Friday.

Model Permutations to Consider for Cost Estimates:

- 1) Full Annex I trading
- 2) Umbrella - trading block that excludes EU and Eastern Europe *to like base case to be trading includes E. Eur. Only EU is excluded*
- 3) AEEI of 1.25
- 4) AEEI of 1.71 (5 labs)
- 5) JI that gets us 20% of the gains of worldwide trading (beyond Annex I trading).
- 6) LDC participation that gets us "key" developing countries - the list of countries separately identified in SGM (Mexico, Korea, China, India).
- 7) JI/LDC participation that gets us key developing countries, and 20% of gains from remaining countries
- 8) Full Worldwide Trading

Question: Are interactions linear? Worth trying some combined and separate estimates to get a feel for this, although we don't want to get out of control. I would suggest the following set of runs:

Run	Annex I Trading	Umbrella excl. E.E.	AEEI 1.25	AEEI 1.71	JI 20%	Key LDC	LDC & JI 20%	Full World
0								
1	x							
2		x						
3			x					
4				x				
5					x			
6						x		
7							x	
8								x
9	x	x						
10	x		x					

11	x			x				
12	x				x			
13	x					x		
14	x						x	
15	x							x
16	x	x			x			
17	x	x				x		
18	x	x					x	
19	x	x						x
20	x	x	x		x			
21	x	x	x			x		
22	x	x	x				x	
23	x	x	x					x

24 x x

Once again, for each of these runs, we want to show:

- permit price
- share of reductions purchased abroad
- dollar costs
- dollar costs as share of GDP

Benefits Estimates

We are considering benefits along three dimensions:

- 1) Electricity restructuring - here, we simply want the dollar figure for gains from a 10% reduction in electricity prices in 2010.
- 2) Reduced costs of NAAQS - we need to present a function which scales this by the share of reductions that are done domestically, so that we can apply the relevant figure to each of the cases above. That is, what are the cost savings from case 0 (where we do it all domestically), versus later cases where less than half of the reduction is done domestically?
- 3) Benefits of revenue recycling - Jeff thinks that this can be cobbled together from the IAT report. This is clearly a function of the domestic permit price, and how much reduction we do domestically. Ray and Randy, can you work on this, using model output from Joc?

Defend Kyoto Order

Manday
Trodg
techn

new china India
residual

20% 31
low
big & nkh ones
"Key LDCs"

clean air

recyclg

Base case 1.00

1.25

Mc

S-Labs - Error 1.75

Mon. Trans mtg.

December 31, 1997

Congestion Related Benefits From Carbon Control Policies

The Kyoto agreement will reduce emissions from carbon by about 27 percent ($100/137=.73$). To the extent that these emissions reductions are achieved through fuel price increases, there will be a reduction in the use of motor vehicles, and there may be resulting increases in traffic congestion.

One recent study suggests that fuel price increases would lead to significant reductions in traffic delays.¹ Several estimates for four metropolitan areas in California indicate that fuel taxes of \$0.50 per gallon in 1991 would have led to reductions in delay of about 7 percent.

A recent report funded by the Department of Transportation put the costs of congestion, relative to free-flowing traffic, at nearly \$60 billion in 1994, up from less than \$40 billion in 1986.² These costs reflect both the dollar value of delays to motorists, and the additional fuel consumption from congestion, although only about a tenth of the total estimated costs are fuel-related.

Thus a \$100/ton carbon tax would lead to a \$0.25/gal fuel tax, and reductions in congestion related delays of about 3.5 percent in the four California cities. If extrapolated nationwide, reductions in congestion related delays, including the fuel savings, would be worth about \$2 billion per year.

These estimates exclude the reductions in inconvenience that travelers would experience as a result of being able to begin trips closer to their preferred travel time. Such reduced inconvenience may be as valuable as the reductions in delay.

¹See *Transportation Pricing Strategies for California: An Assessment of Congestion, Emissions, Energy and Equity Impacts*, California Environmental Protection Agency, November 1996

² *Urban Roadway Congestion --1982 to 1994* Texas Transportation Institute, Texas Department of Transportation, and the Federal Highway Administration, August 1997

Work in Progress, 1/12/98

Costs and benefits of U.S. participation in the Kyoto Agreement

Costs and Benefits Summary

Scenario (no sinks)	Permit Price	Resource Cost	Possible Monetized Benefits ¹
10/97 Administration Position (6 gases, net-net sinks, 1990 by 2010)	\$148/ton	\$41 billion	\$25 billion
Kyoto Protocol: No International Trading ²	\$171/ton	\$51 billion	\$29 billion
Full Annex I Trading	\$48/ton	\$22 billion	\$8 billion
Umbrella excluding EU and Eastern Europe	\$43/ton	\$20 billion	\$7 billion
Umbrella excluding EU	\$26/ton	\$13 billion	\$4 billion
Annex I Trading + JI (JI = 20% worldwide trading)	\$36/ton	\$17 billion	\$6 billion
Annex I Trading + Participation by Key Developing Countries ³	\$20/ton	\$10 billion	\$3 billion
Annex I Trading + Full Worldwide Trading	\$19/ton	\$10 billion	\$3 billion
Umbrella excluding EU + Full Worldwide Trading	\$10/ton	\$6 billion	\$2 billion

¹ Preliminary and undergoing revision. Incl. air pollution, congestion, accidents, roads.

² All subsequent cases evaluate the Kyoto Protocol.

³ Key developing countries include China, India, Mexico, and Korea.

Excl. electricity
rescheduling

With accounting for sinks

Full Annex I Trading

Sinks Assumption	Permit Price	Resource Cost	Possible Monetized Benefits
No Sinks (U.S.: 0 MMTCE)	\$48/ton	\$22 billion	\$8 billion
Half of Land Use Change and Forestry Sinks (U.S.: 52 MMTCE)	\$26/ton	\$12 billion	\$4 billion
All of Land Use Change and Forestry Sinks (U.S.: 104 MMTCE)	\$11/ton	\$5 billion	\$2 billion

Two very large categories of potential benefits have been left out of the foregoing list of costs and benefits: revenue recycling and climate change mitigation.

Revenue recycling If the emission permits to be issued in the budget period, 2008-2012, were to be auctioned off, rather than allocated for free, the resulting revenue for the government could provide major benefits. If the revenue were used to reduce taxes that fall on capital (i.e., to reduce the capital gains tax or corporate income tax, or to add an investment tax credit), then the result would be an increase in investment, and therefore an increase in growth. According to the Repetto-Austin meta-analysis of 16 leading models, the assumption of such revenue recycling together with several other assumptions (non-carbon backstop fuel, CGE model, increased energy and product substitution, and an idealized form of JI equivalent to global trading) is enough to turn what would otherwise be a negative effect of GDP into a positive one [2020]. Similarly, the IAT report estimated that under a policy of recycling revenues to business, the GDP effect would turn from negative to positive around 2010.¹ Using the revenue for deficit reduction is almost as good, because it lowers interest rates and again stimulates investment. Jorgenson, Shackleton, and other economists have similar findings.

However, returning the revenue to the general public through reductions in income taxes or payroll taxes, or through lump-sum redistribution, does not produce positive effects on GDP in these models. We suppose that cutting corporate taxes would be undesirable on political and income-distribution grounds, and that the government may want to use the revenue to ease the burden on those (e.g., displaced coal miners) who might be disadvantaged. For this reason, we have not as yet pursued the revenue recycling idea (also known as the double-dividend) any further.

Climate Change mitigation The goal of the entire exercise, of course, is to begin to move to an emissions path that implies lower levels of atmospheric concentrations of GHGs in future centuries, and thereby mitigate the likely extent of global climate change. Estimates of the economic damages from climate change (e.g., in the Integrated Assessment models of Nordhaus, Cline, and other economists) fall into the following areas: agriculture, sea-level rise, air conditioning and heating, water supply, human life and health, air pollution, and other costs (hurricanes, migration costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss). One must sympathize with those who critique the economists on the grounds that these costs are extremely difficult to quantify, particularly when it comes to possible catastrophe scenarios to which the scientists cannot assign a reliable probability.

¹ (Figure 13 in IAT); this analysis assumes stabilization at 1990 levels by 2010, with 10-year phase-in; assuming a 1.25 % annual decrease in EEI.

It turns out that the subject of perhaps the greatest uncertainty and sensitivity is the discount rate that is applied to the benefits of averting future climate change. Such a discount rate is needed, because the economic costs of the policies under discussion occur over the next few decades, whereas the prime benefits of averting climate change occur in coming centuries. Yet there is little agreement, even among economists, on the appropriate discount rate. Cline, for example, explicitly considers a low discount rate (and a high aversion to possible catastrophe) in getting his conclusion that the benefits of early and strong action outweigh the costs.

We take it as self-evident that the benefits of averting climate change are potentially enormous. But we have, so far, chosen not to try to quantify them in monetary terms, in light of the quantitative uncertainty, their timing (far outside the 2008-2012 window), and the need to make difficult decisions regarding the post 2012 path of emissions cuts in order to produce meaningful reductions in future concentrations. We are inclined to favor an attempt to add up the various possible costs and benefits of emissions policy excluding climate change. Thus a conclusion might be phrased along lines such as "the net benefits of our policies to reduce emissions [under the following conditions...] are likely to be positive, even before taking into account the benefits of averting climate change itself."

Preliminary Draft

Ancillary Benefits of US participation in the Kyoto Agreement

I. Benefits Expressible in Monetary Terms (billions of dollars per year) given \$50/ton carbon.

Emissions reductions	\$3,000 ton for MoX rec in non-attainment areas lower in attainment areas		conservative
Utilities	\$1.1		
Vehicles	\$0.3		
Other	\$0.4		
Highway fatalities	\$4.3	Higher cost ⇒ less driving (Also speed)	potential offsets Lower weight could mean fewer accidents
Highway accidents	\$1.5		
Highway congestion	\$1		
Highway maintenance expenses	NA		
Total	\$8.5	comfortable with half	

II. Unquantifiable benefits

Inconvenience from highway congestion
Mercury emissions reductions
Sulfur dioxide emissions control cost savings
Energy independence

III. Warning: This table is intended to show only that quantifiable monetary benefits could reach high billions of dollars per year. These numbers are exceptionally rough and greater precision is unwarranted. Key caveats include

- 1) reductions in highway fatalities ignore higher average speeds from reduced congestion, and lighter potentially less safe cars;
- 2) ~~potential double counting of some highway fatalities in highway accidents, and~~
- 3) uncertain, subjective, but conservative valuation of ancillary emissions reductions based on cost avoided.

January 8, 1998

Work in Progress, 1/12/98

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Umbrella excluding EU and Eastern Europe	\$43/ton	\$20 billion	\$7 billion
Umbrella excluding EU	\$26/ton	\$13 billion	\$4 billion
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Umbrella excluding EU + Full Worldwide Trading	\$10/ton	\$6 billion	\$2 billion

¹ Preliminary and undergoing revision. Incl. air pollution, congestion, accidents, etc.

² All subsequent cases evaluate the Kyoto Protocol.

³ Key developing countries include China, India, Mexico, and Korea.

Excl. electricity
rescheduling
\$16-\$18 b

With accounting for sinks

Full Annex I Trading

Sinks Assumption	Permit Price	Resource Cost	Possible Monetized Benefits
No Sinks (U.S.: 0 MMTCE)	\$48/ton	\$22 billion	\$8 billion
Half of Land Use Change and Forestry Sinks (U.S.: 52 MMTCE)	\$26/ton	\$12 billion	\$4 billion
All of Land Use Change and Forestry Sinks (U.S.: 104 MMTCE)	\$11/ton	\$5 billion	\$2 billion

To do: higher AEEs

Two very large categories of potential benefits have been left out of the foregoing list of costs and benefits: revenue recycling and climate change mitigation.

Revenue recycling If the emission permits to be issued in the budget period, 2008-2012, were to be auctioned off, rather than allocated for free, the resulting revenue for the government could provide major benefits. If the revenue were used to reduce taxes that fall on capital (i.e., to reduce the capital gains tax or corporate income tax, or to add an investment tax credit), then the result would be an increase in investment, and therefore an increase in growth. According to the Repetto-Austin meta-analysis of 16 leading models, the assumption of such revenue recycling together with several other assumptions (non-carbon backstop fuel, CGE model, increased energy and product substitution, and an idealized form of JI equivalent to global trading) is enough to turn what would otherwise be a negative effect of GDP into a positive one [2020]. Similarly, the IAT report estimated that under a policy of recycling revenues to business, the GDP effect would turn from negative to positive around 2010.¹ Using the revenue for deficit reduction is almost as good, because it lowers interest rates and again stimulates investment. Jorgenson, Shackleton, and other economists have similar findings.

However, returning the revenue to the general public through reductions in income taxes or payroll taxes, or through lump-sum redistribution, does not produce positive effects on GDP in these models. We suppose that cutting corporate taxes would be undesirable on political and income-distribution grounds, and that the government may want to use the revenue to ease the burden on those (e.g., displaced coal miners) who might be disadvantaged. For this reason, we have not as yet pursued the revenue recycling idea (also known as the double-dividend) any further.

Climate Change mitigation The goal of the entire exercise, of course, is to begin to move to an emissions path that implies lower levels of atmospheric concentrations of GHGs in future centuries, and thereby mitigate the likely extent of global climate change. Estimates of the economic damages from climate change (e.g., in the Integrated Assessment models of Nordhaus, Cline, and other economists) fall into the following areas: agriculture, sea-level rise, air conditioning and heating, water supply, human life and health, air pollution, and other costs (hurricanes, migration costs, human amenity, construction, leisure activities, urban infrastructure, and ecological damages such as forest loss and species loss). One must sympathize with those who critique the economists on the grounds that these costs are extremely difficult to quantify, particularly when it comes to possible catastrophe scenarios to which the scientists cannot assign a reliable probability.

¹ (Figure 13 in IAT); this analysis assumes stabilization at 1990 levels by 2010, with 10-year phase-in; assuming a 1.25 % annual decrease in EEI.

It turns out that the subject of perhaps the greatest uncertainty and sensitivity is the discount rate that is applied to the benefits of averting future climate change. Such a discount rate is needed, because the economic costs of the policies under discussion occur over the next few decades, whereas the prime benefits of averting climate change occur in coming centuries. Yet there is little agreement, even among economists, on the appropriate discount rate. Cline, for example, explicitly considers a low discount rate (and a high aversion to possible catastrophe) in getting his conclusion that the benefits of early and strong action outweigh the costs.

We take it as self-evident that the benefits of averting climate change are potentially enormous. But we have, so far, chosen not to try to quantify them in monetary terms, in light of the quantitative uncertainty, their timing (far outside the 2008-2012 window), and the need to make difficult decisions regarding the post 2012 path of emissions cuts in order to produce meaningful reductions in future concentrations. We are inclined to favor an attempt to add up the various possible costs and benefits of emissions policy excluding climate change. Thus a conclusion might be phrased along lines such as "the net benefits of our policies to reduce emissions [under the following conditions...] are likely to be positive, even before taking into account the benefits of averting climate change itself."

Costs and benefits of U.S. participation in the Kyoto Agreement

Costs and Benefits Summary

Scenario (no sinks)	Permit Price	Resource Cost	Possible Monetized Benefits ¹
10/97 Administration Position (6 gases, net-net sinks, 1990 by 2010)	\$148/ton	\$41 billion	\$25 billion
Kyoto Protocol: No International Trading ²	\$171/ton	\$51 billion	\$29 billion
Full Annex I Trading	\$48/ton	\$22 billion	\$8 billion
Umbrella excluding EU and Eastern Europe	\$43/ton	\$20 billion	\$7 billion
Umbrella excluding EU	\$26/ton	\$13 billion	\$4 billion
Annex I Trading + JI (JI = 20% worldwide trading)	\$36/ton	\$17 billion	\$6 billion
Annex I Trading + Participation by Key Developing Countries ³	\$20/ton	\$10 billion	\$3 billion
Annex I Trading + Full Worldwide Trading	\$19/ton	\$10 billion	\$3 billion
Umbrella excluding EU + Full Worldwide Trading	\$10/ton	\$6 billion	\$2 billion

¹ Preliminary and undergoing revision. Incl. air pollution, congestion, accidents, roads.

² All subsequent cases evaluate the Kyoto Protocol.

³ Key developing countries include China, India, Mexico, and Korea.

Excl. electricity
rescheduling

With accounting for sinks

Full Annex I Trading

Sinks Assumption	Permit Price	Resource Cost	Possible Monetized Benefits
No Sinks (U.S.: 0 MMTCE)	\$48/ton	\$22 billion	\$8 billion
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Kyoto costs & benefits

J4 would have to testify range of uncertainty

3 hard QUESTIONS.

- J4
- (1) How far toward worldwide idealized trading
 $\therefore \$48/\text{ton} \downarrow$ (might have to say \$171 if asked about no trading case)
 - (2) willing to incl. electr. MSTR?
 yes, but have to say that could do it independently, if asked
 - (3) Higher AEEs
 As part of range. Controversy betw. engineers & ecologists.
- J4

cc: JF

JF

From Joe Corder

TG: RL

From: JF

12/29/97

Model Permutations to Consider:

- 1) Full Annex I trading
- 2) EU doesn't trade
- 3) Umbrella - trading block that excludes EU and Eastern Europe
- 4) Worldwide trading
- 5) AEEI that is consistent with 5 labs (find this by increasing AEEI in basic model such that it yields \$50/ton permit price with domestic only reductions).

Question: Are interactions linear? Worth trying some combined and separate estimates to get a feel for this, although we don't want to get out of control. I would suggest the following set of runs:

- 1-5) Do the five factors individually
- 6) Umbrella, with 5 labs (I think that we should do permutations with umbrella case, rather than EU doesn't trade case, since I think that this is more realistic).
- 7) Worldwide trading, with umbrella
- 8) Worldwide trading, with 5 labs
- 9) Worldwide trading, with umbrella and 5 labs (most optimistic case)

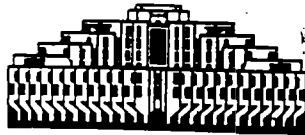
For each of these cases, we should show what happens to permit price, and what share of our reductions are purchased abroad.

Questions/Other Things to Do:

- 1) What about recalibrating the model for the new international baselines? We should probably try to do a little of this before we produce the numbers. Joe will have to discuss how to do this with EPA and DoE folks.
- 2) Benefits of electricity restructuring. I have data on the economic benefits. Question is: do we want to score the environmental benefits? DoE says that could have as much as 5% reduction in carbon due to restructuring (80 mmt). Should we add this as one of our model permutations? I would argue no. We should instead have a set of "reasons why our numbers may be too high", including electricity restructuring benefits, as well as the industry consultation stuff that Dirk was talking about.

3) Other benefits of reducing use of carbon fuels. Jeff is going to talk to Austin about this, and Randy and Ray will work on it as well. I've spoken to Ray, and he is going to call Randy. The mandate that I gave him was twofold: first, figure out what the literature has to say on the benefits of reaching our target and timetable (in dollar terms); second, note how comfortable we are with the quality of this literature, and, if there are pieces with which we are more or less comfortable, separate those pieces out.

4) GDP/job effects. Do we want to think about this as well, or just focus on permit prices? Can we get some of this fairly costlessly from the same model runs that Joe will be doing? If so, we may want to add these to the table of results.



From the desk of ... Jeffrey Frankel

- High estimates of disasters & low discount rate
- other non-economic benefits
- (C) Generate revenues from auction
 - recycle by cutting taxes on capital
- optimistic assumptions about response of technology & consumption patterns to prices
- optimistic assumption about Techn. response to R&D
- (C) [+ int. trading, esp. with FSU & without EU]

✠ Laromme Jerusalem hotel מלון לרומ ירושלים ✠

Liberty Bell Park, 3 Jabotinsky St., Jerusalem 92145 Israel Tel. (02) 6756-666 Fax. (02) 6756-777
נן הפעמון, רח' דבובינסקי 3, ירושלים 92145 טל 6756-666 (02) 989 (02) 6756-777

Рауен

- (c) Annex 2 Trading incl. ambient.

Total / Damage
leg. 1

- (2) Low full participation

Kimble us?

- (3) Clean Dev. $MgCl_2$ 1/32

Jan Belsky

less: engine

- (c) S.W.S

bill H. Meyer et al

- (51) 2 flows world bk curr. sds.

- Benefits
- Full trading EU out
- what techn. rate do we need

Ray

JOE

Trading

Annex 2

annex 2 excl. Europe (incl. E.E.)

annex 2 excl. EU

global excl. EU

Translate marginal p into total cost (incl. as % of GDP)

From Kyoto Agreement.

other gases,
what about sinks, etc.

by treating the agreement as

New model runs from SCM with new gas sink formula.

How far off are we
1990 in 2010?

Look at full LDC participation, or participation
of just largest & richest countries

12/23/97

Estimates of the benefits of emissions abatement:

(1) averting global warming (2) other pollution benefits

Investigate references in Integrated Assessment lit (Nordhaus...Stanford EMF..., Cline)

Investigate research on (non-warming) pollution benefits: Schmalensee, Viscusi...

Investigate references in Duncan Austin's study, p.24.

Talk to Austin.

Talk to Rosina or others in OSTP.

Consider implications of the PM-Ozone Clean Air Act process.

Coordinate with Ray Squitieri (and Jon Gruber) at Treasury.

Pull in Sarah to help you at some point, if necessary.



Jeffrey A. Frankel
12/23/97 06:02:16 PM

Record Type: Record

To: Joseph E. Aldy/CEA/EOP

cc:

Subject: GCC marching orders

Joe

I hope you had a good break.

We now have a game plan. We want to see what it would take for benefits from GCC policy to outweigh costs. Randy is working on benefits. You are working on costs. We are coordinating with Gruber and Squitieri.

The first step for you is to finish writing up your memo summarizing what you did for Gruber under various international trading combinations (Annex I; Annex I excl. all Europe; Annex I excl EU).

But we also need:

- an entry in that memo for global trading (with and without the EU); and perhaps a version that includes only the largest and richest LDCs, not the others
- calculation of figures that add up the area under the curve to get total cost (do your "abatement costs" do that? or are they simply marginal cost times quantity), and also express them as % of GDP (Janet might like PDV of foregone consumptions; but (i) as I understand it, SGM can't do that, and (ii) Gene thinks that is not comprehensible to the public, and therefore irrelevant.)
- some accounting for the treatment of the 5 non-carbon gases and sinks, as specified in the Kyoto agreement

Please give me progress reports.

Thks

JF

Sinks

[illegible]

[illegible]

To Jun Gruber

Fax 237-1786

Tel 237-6552

Master
Table

2 pages

SGM results 2 pages

Richels 6 pages

+ Richels

2-page table

ID	Scenario	Model	Modelers	Target	Timetable	Trading	Permit Allocation	Revenue Recycling	Burden Sharing	BAU Emissions Path Assumption	AEEI	Ramp-up	Time Path	Outputs PDV (3%; 2000-2050) Foregone Consumption	Permit Prices: 2010	Permit Prices: 2025	Permit Prices: 2050	Electricity Prices: 2010, 2025, 2050
SGM1	BAU	SGM	Battelle	n/a	n/a	n/a	n/a	n/a	n/a	IAT	1.0	n/a	-->2050, -->2100 (climate)	\$183,155 billion (BAU consumption)	\$0	\$0	\$0	
SGM2	1990 in 2010	SGM	Battelle	1990 emissions level	stabilize in 2010	domestic only	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$1126 billion	\$110	\$191	\$582	
SGM3	1990 in 2010	SGM	Battelle	1990 emissions level	stabilize in 2010	Annex I	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$84 billion	\$42	\$84	\$149	
SGM4	1990 in 2010	SGM	Battelle	1990 emissions level	stabilize in 2010	worldwide	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$5 billion	\$16	\$23	\$32	
SGM5	1995 in 2010	SGM	Battelle	1995 emissions level	stabilize in 2010	domestic only	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$737 billion	\$62	\$131	\$317	
SGM6	1995 in 2010	SGM	Battelle	1995 emissions level	stabilize in 2010	Annex I	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$645 billion	\$74	\$119	\$201	
SGM7	1995 in 2010	SGM	Battelle	1995 emissions level	stabilize in 2010	worldwide	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$38 billion	\$27	\$32	\$41	
SGM8	-10% if 1990 in 2010	SGM	Battelle	-10% 1990 emissions level	stabilize in 2010	domestic only	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$1630 billion	\$175	\$304	\$924	
SGM9	-10% if 1990 in 2010	SGM	Battelle	-10% 1990 emissions level	stabilize in 2010	Annex I	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$808 billion	\$91	\$137	\$238	
SGM10	-10% if 1990 in 2010	SGM	Battelle	-10% 1990 emissions level	stabilize in 2010	worldwide	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$63 billion	\$33	\$37	\$45	
SGM11	Peak in 2015	SGM	Battelle	2010 BAU emissions in 2015; 1990 level in 2040	stabilize in 2040	domestic only	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$498 billion	\$0	\$84	\$559	
SGM12	Peak in 2015	SGM	Battelle	2010 BAU emissions in 2015; 1990 level in 2040	stabilize in 2040	Annex I	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	\$125 billion	\$0	\$47	\$155	
SGM13	Peak in 2015	SGM	Battelle	2010 BAU emissions in 2015; 1990 level in 2040	stabilize in 2040	worldwide	auction	lump-sum	no LDC part.	IAT	1.0	no	-->2050, -->2100 (climate)	-\$16 billion	\$0	\$14	\$33	
MM1	BAU	Markal	DOE	n/a	n/a	n/a	n/a	n/a	n/a	IAT	-1.0	n/a	-->2025	n/a	\$0	\$0	n/a	
MM2	1990 in 2010	Markal	DOE	1990 emissions level	stabilize in 2010	domestic only	auction	lump-sum	no LDC part.	IAT	-1.0	n/a	-->2025		\$148	\$192	n/a	
MM3	1995 in 2010	Markal	DOE	1995 emissions level	stabilize in 2010	domestic only	auction	lump-sum	no LDC part.	IAT	-1.0	n/a	-->2025		\$136	\$146	n/a	
MM4	1990 in 2020	Markal	DOE	1990 emissions level	stabilize in 2020	domestic only	auction	lump-sum	no LDC part.	IAT	-1.0	n/a	-->2025		\$0	\$198	n/a	
MM5	Peak in 2015	Markal	DOE	2010 BAU emissions in 2015; 1990 level in 2040	stabilize in 2040	domestic only	auction	lump-sum	no LDC part.	IAT	-1.0	n/a	-->2025		\$0	\$99	n/a	
	550ppm Least-Cos	MERGE	Richels	550ppm concentration														

26 of 281 no permit, no price
Views continued on next page

Oil Prices: 2010, 2025, 2050	Conc. (ppmv) in 2050 (Deviation from BAU)	Conc. (ppmv) in 2100 (Deviation from BAU)	Year Conc. (550 ppmv) Reaches 2x Pre-Ind. Level (Deviation from BAU)	Change in Temp. (deg. C) from 1990 in 2050 (Deviation from BAU)	Change in Temp. (deg. C) from 1990 in 2100 (Deviation from BAU)	Emission s Peak, mmtce (year)	Year Returns to 1990	Intl. Trade of Permits, 2010, 2050 (mmtce)	Date Received Run	File
	502	711	2065	1.06	2.36	no peak: 2245 (2050)	n/a	n/a	08/21/97	aldy/sgmruns/c ea90_~1.xls
	485 (-17)	658 (-53)	2072 (+7)	0.99 (-0.07)	2.16 (-0.20)	1637 (2005)	2010	n/a	08/21/97	aldy/sgmruns/c ea90_~2.xls
	485 (-17)	658 (-53)	2072 (+7)	0.99 (-0.07)	2.16 (-0.20)	no peak: 1714 (2050)	never returns	-202, -364	08/21/97	aldy/sgmruns/c ea90_~2.xls
	485 (-17)	658 (-53)	2072 (+7)	0.99 (-0.07)	2.16 (-0.20)	no peak: 2102 (2050)	never returns	-313, -752	08/21/97	aldy/sgmruns/c ea90_~2.xls
	481 (-21)	648 (-63)	2074 (+9)	0.98 (-0.08)	2.12 (-0.24)	1637 (2005)	never returns	n/a	08/21/97	aldy/sgmruns/c ea95_~1.xls
	481 (-21)	648 (-63)	2074 (+9)	0.98 (-0.08)	2.12 (-0.24)	1637 (200	never returns	36, -122	08/21/97	aldy/sgmruns/c ea95_~1.xls
	481 (-21)	648 (-63)	2074 (+9)	0.98 (-0.08)	2.12 (-0.24)	no peak: 2073 (2050)	never returns	-131, -593	08/21/97	aldy/sgmruns/c ea95_~1.xls
	481 (-21)	653 (-58)	2074 (+9)	0.97 (-0.09)	2.11 (-0.25)	1637 (2005)	2010	n/a	08/21/97	aldy/sgmruns/c ea90m_~1.xls
	481 (-21)	653 (-58)	2074 (+9)	0.97 (-0.09)	2.11 (-0.25)	1637 (2005)	never returns	-180, -332	08/21/97	aldy/sgmruns/c ea90m_~1.xls
	481 (-21)	653 (-58)	2074 (+9)	0.97 (-0.09)	2.11 (-0.25)	no peak: 2060 (2050)	never returns	-332, -845	08/21/97	aldy/sgmruns/c ea90m_~1.xls
	489 (-13)	653 (-58)	2072 (+7)	1.01 (-0.05)	2.15 (-0.21)	1807 (2015)	2040	n/a	08/21/97	aldy/sgmruns/c ea90_~1.xls
	489 (-13)	653 (-58)	2072 (+7)	1.01 (-0.05)	2.15 (-0.21)	1807 (2015)	never returns	0, -367	08/21/97	aldy/sgmruns/c ea90_~1.xls
	489 (-13)	653 (-58)	2072 (+7)	1.01 (-0.05)	2.15 (-0.21)	no peak: 2102 (2050)	never returns	0, -752	08/21/97	aldy/sgmruns/c ea90_~1.xls
	n/a	n/a	n/a	n/a	n/a	no peak: 2066 (2005)	n/a	n/a	08/26/97	aldy/markal~17 8_26run1.wk4
	n/a	n/a	n/a	n/a	n/a	1385 (2005)	2010	n/a	08/26/97	aldy/markal~17 8_26run1.wk4
	n/a	n/a	n/a	n/a	n/a	1600 (2005)	n/a	n/a	08/26/97	aldy/markal~17 8_26run1.wk4
	n/a	n/a	n/a	n/a	n/a	1749 (2010)	2020	n/a	08/26/97	aldy/markal~17 8_26run1.wk4
	n/a	n/a	n/a	n/a	n/a	1767 (2015)	2040*			aldy/markal~17 8_26run1.wk4

Table 4

Climate and Economic Variables under Alternative Emissions Paths *

		<u>Concentration Level (ppmv)</u>		<u>Year at Which Concentration Reaches 2x Pre-Industrial Level **</u>	<u>Change in Temperature from 1990 Level (Celsius)</u>	
	<u>Year</u>	<u>2050</u>	<u>2100</u>		<u>2050</u>	<u>2100</u>
Business As Usual (BAU)		502	711	2064	1.06	2.36
<i>Deviation from BAU:</i>						
Annex I Participation Only	1990 -10% beginning in 2010	-21	-58	+10	-0.09	-0.25
	1990 beginning in 2010	-17	-53	+8	-0.07	-0.20
	peak in 2015, 1990 in 2040	-13	-52	+7	-0.06	-0.19
	1990 +10% beginning in 2010	-14	-47	+7	-0.07	-0.18
		<u>Carbon Permit Price (\$ per ton)</u>				<u>Consumption *** (billions of \$)</u>
		<u>Domestic Trading</u>		<u>Annex I Trading</u>		
		<u>2010</u>	<u>2050</u>	<u>2010</u>	<u>2050</u>	
Business As Usual (BAU)		0.00		0.00		121,650
<i>Deviation from BAU:</i>						
Annex I Participation Only	1990 -10% beginning in 2010	+175	+824	+91	+238	-880
	1990 beginning in 2010	+110	+582	+42	+149	-670
	peak in 2015, 1990 in 2040	+12	+563	+11	+153	-270
	1990 +10% beginning in 2010	+60	+310	+17	+113	-460

Summary description

A plan to return carbon emissions to their 1990 levels by 2010 postpones by 8 years the date at which CO₂ concentrations reach twice pre-industrial levels. Global warming would be reduced by 0.20 degrees by the year 2100 versus an estimated 2.36 degrees under BAU. Under this emissions path the value of the estimated foregone consumption is \$670 billion.

A less ambitious path -- "eliminate emissions growth by 2010-2020" -- would postpone the doubling date by 3 years less, and would lead to another 0.01 degrees of warming. But, the economics would become much easier: The value of foregone consumption would be only \$270 billion.

* Preliminary CEA projections. The origin of these preliminary numbers is described on the accompanying page.

** Pre-industrial concentrations of CO₂ were approximately 275 ppmv.

*** Assumes domestic trading only. Annex I or worldwide trading may substantially reduce these costs. Deviations are foregone consumption assuming a 5% discount rate for the time horizon 2000-2050.

September 4, 1997

Sources and Explanations

Sources

Business As Usual (BAU) emissions projections are based on the assumptions employed in the IAT process. These projections incorporate the Annual Energy Outlook and International Energy Outlook projections, and closely mirror the IPCC IS92a emissions profiles with modifications made for the economic decline in the Former Soviet Union and Eastern Europe. BAU concentration and temperature projections are from the MAGICC model. Carbon permit price estimates and foregone consumption figures are from the SGM model. All these results were provided by Jae Edmonds, Marshall Wise, and Chris MacCracken at Battelle, Washington, DC.

Participation Cases

Annex I Participation Only: Assumes full compliance of stated targets and timetables by countries in Annex I; rest of the world behaves as in BAU.

Targets and Timetables

1990 (+/-10%) in 2010: Emissions follow BAU through 2000, reduce to 1990 (+/-10%) levels by 2010, and remain at 1990 levels thereafter.

Peak in 2015, 1990 in 2040: Emissions follow BAU through 2005, peak at 2010 BAU levels in 2015, and stabilize at 1990 levels in 2040 and into the future. Because of linear interpolation in emissions profile between 2015 and 2040, this scenario may slightly overestimate the deviation of concentration from BAU.

Trading Scenarios

Domestic Trading: Trading only within each country.

Annex I Trading: Permits are grandfathered to Annex I nations based on 1990 emissions levels. All Annex I countries participate in the trading of permits.

Price Assumptions

Carbon: U.S. permit prices for the four policy options are from SGM, which assumes that all revenues are returned to the economy through a lump-sum redistribution.

Consumption: Deviations are present discounted value of foregone consumption differences for United States in billions of dollars between BAU and scenarios. The present discounted value assumes a discount rate of 5% and a time horizon of 2000-2050.



Joseph E. Aldy
09/04/97 10:06:03 PM

Record Type: Record

To: Jeffrey A. Frankel/CEA/EOP

cc:

Subject: Richels new data

Jeff,

Attached is a WP file with section 3 of the T&T paper with Richels comments and new data he sent to us today.

Joe



RICHELS1.WPI

3. Estimates of least-cost paths to stabilize concentration levels

An alternative strategy is to reason that the probability of catastrophe may rise to unacceptable levels unless GHG concentrations are capped at some particular level. Such an approach has the disadvantage that the choice of any specific concentration level is arbitrary, and is inconsistent with the spirit of cost-benefit analysis. But it has the advantage of being analytically tractable.

Stabilization of concentrations at 550 ppmv

We will consider the question of the optimal path subject to the constraint that concentrations be stabilized at 550 ppmv (approximately double the pre-industrial level of 275 ppmv¹). One might ask why we need accept a level of concentrations, and corresponding probability of catastrophe, as high as this. Indeed, why accept any probability of catastrophe? It is important to recognize that it is already too late to keep this probability at zero (even if one were to accept that it would have been worth the cost to do so, had we known at the beginning of the Industrial Revolution what we know now). Concentrations are already at 365 ppmv, and it is impossible to prevent them rising further in the short run; one would have to reduce emissions virtually to zero to do so.

It would be useful to quantify the implicit gap between this strategy and the strategies resulting from the unconstrained optimization by the Integrated Assessment models. The difference represents the role being accorded to the four bullet points above. In addition, some sensitivity analysis with respect to the level of the concentration constraint would be desirable.

Results for a less aggressive path

Wigley, Richels and Edmonds (1996) [WRE] examined alternative paths to reach 550 ppmv and other concentration levels. They considered a path where global emissions peaked in 2030 and did not return to 1990 levels until some date past 2100. Manne-Richels (1997) use the MERGE model to examine the implications of the WRE path in more detail. In their model, emissions from OECD countries as well as from other Annex I countries (most of the former Soviet Union and Eastern Europe) peak in the decade 2010-2020. (Annex I emissions do not return to their 1990 levels until sometime early in the decade 2030-2040. The price of crude oil peaks in 2040.) The reason that the peak in worldwide emissions lags two decades behind the peak in Annex I emissions is that the developing countries do not peak until 2050.

WRE argue that this path has much lower economic costs than proposed paths that are more aggressive in terms of timing, while producing the same terminal effects on concentration. The more aggressive path they examine is the IPCC Working Group path 1 [WGI], which entails Annex I fossil fuel emissions peaking in 1990, and falling 24 percent worldwide below 1990 levels by 2010.² (Of course, it is too late for this scenario to be realized. Below, we will also consider

¹ The concentration figure refers only to CO₂. Emission of other greenhouse gases will raise the warming potential, or carbon-equivalent, above this level.

² Worldwide emissions are up 8 percent in 2010 [from 5.885 to 6.351]. These numbers come from 8/28 personal communication with Richels. (Earlier communication had worldwide emissions rising 13.64% by 2010 under the IPCC path [to 7.798 PgC]. Evidently the former statistic refers only to fossil fuel

other alternative proposals that, while sufficiently ambitious as to be expensive to achieve, at least have the virtue of not having been ruled out by the passage of seven years during which emissions manifestly have not in fact begun to fall in the overwhelming majority of countries.)

The best single measure of aggregate economic costs is the present discounted value, i.e., the appropriate summation over time, of foregone consumption. The IPCC Working Group path shows a total worldwide consumption loss of \$8.6 trillion. (The number would be lower if international trading were allowed -- \$3.3 trillion. On the other hand, the cost would be higher if the developing countries do not agree to the targets envisioned. Indeed, if the developing countries do not participate at all, then the goal would be impossible to attain at any cost.) The more moderate WRE path toward the same concentration goal entails far smaller costs: a total worldwide cost of \$1.57 trillion. (With global trading, it is \$0.77 trillion. The difference illustrates the great benefits of "where flexibility," assuming that international trading can be successfully implemented.) Thus the saving from letting emissions continue to rise as late as 2010 is more than three-quarters of the cost.

WRE did not attempt to compute the least-cost path for reaching the same goal.

The least-cost mitigation path

Manne and Richels (1997) is believed to be virtually the first paper to compute the path that minimizes costs (again, using the MERGE model), subject to the constraint of stabilizing concentrations at a level such as 550 ppmv.³ They must necessarily make some assumption about international burden-sharing. The particular question is as follows: how much can we insist that developing countries (who are poor, but in many cases rapidly growing) reduce their emissions, relative to their (low, but often rapidly growing) paths? For the case of 550 ppmv concentrations, they assume that non-Annex I countries can plausibly be expected to begin to limit emissions in 2030, and to complete a transition to a regime under which their per-capita emission rights are equal to those of the industrialized countries by 2050.⁴

The global numbers that Manne and Richels reported in their paper need to be broken down by region. In addition, we asked them to constrain the year 2000 emission levels to the BAU level, under the theory that a treaty that reduces emissions beginning in 1990 has already been ruled out by history, and that even a start in 1998 is so unlikely. Their model implies that the least cost mitigation path has emissions from OECD countries, as well as from other Annex I countries, in general, peaking in the decade 2020-2030, a bit behind the WRE path. The peak of Annex I emissions is 29 percent above 1990 levels. [Source: personal communication from

emissions and the latter to all carbon emissions.)

³ Also Manne and Richels (1995). Kosobud, et al (1994) examine alternative paths to achieve a given temperature target in 2100. All three papers find that a return to 1990 emission levels early in the 21st century is a needlessly costly way to attain the 2100 goals for concentration and climate.

⁴ Based on 1990 populations. We consider alternative scenarios in Appendix __. One alternative is that the developing countries do not participate at all. It would also be desirable to look at the implications of a plan under which a small number of middle-income countries (particularly Korea and Mexico) begin to limit emissions by 2010. Without China and India, however, the emissions of the middle-income countries are a small fraction of the world total, so that their involvement would be important only in order to point the way for other emerging economies, rather than to reduce emissions perceptibly in their own right.

Richels, 8/21 and 8/28/97.] Emissions do not return to their 1990 levels until after 2050. Emissions from developing countries peak in 2050. As noted, the sum of the two, total worldwide emissions, also peaks in 2050. Worldwide emissions return to their 1990 levels shortly before the end of the 21st century. By mid-century, developing countries are such an important source of emissions that they dominate the global peaking date and the date of return to 1990 levels.

The least cost mitigation path generates quite low values for carbon emissions rights after implementation in 2000. In 2010, the permit price is \$2/ton and slowly rises to \$3/ton in 2020. Only in the latter part of the century does it rise significantly to \$156/ton in 2100. In contrast to the least cost path, the following table demonstrates the effect of constraining Annex I emissions relative to 1990 levels in 2010. The constraint is imposed over the period 2010-2030. After 2030, further reductions in Annex I emissions occur consistent with the burden sharing formula described earlier. The permit price estimates presuppose full global trading (where flexibility) but not intertemporal trading (when flexibility).

Change in emissions relative to 1990	Permit Price in 2010 (\$/ton)	Permit Price in 2020 (\$/ton)	Consumption Losses (trillions of dollars) ⁵		
			U.S.	Annex I	World
+10%	4	65	0.293	0.564	0.782
0%	67	88	0.303	0.619	0.939
-10%	120	112	0.429	1.054	1.276

It is important to keep in mind that the permit price estimates assume perfect global trading. Under this assumption, emission reductions occur where it is cheapest to do so regardless of geographic location. The following table shows permit prices in 2010 when Annex I emissions are constrained to 1990 levels under alternative assumptions about where flexibility.

U.S. Permit Prices in 2010, 1990 Level in 2010 Scenario

Where Flexibility	Global Trading	Annex I Only Trading	Domestic Only Trading
Permit Price in 2010 (\$/ton)	67	132	204

According to Manne and Richels, their least cost mitigation path costs the U.S. \$0.124 trillion in terms of lost consumption (present discounted value), as compared to \$1.28 trillion under the IPCC Working Group path and as compared to \$0.303 trillion under the "1990 in

⁵ The present discounted value of consumption assumes a 5% discount rate and a time horizon of 1990-2100.

2010" path. Thus the least cost mitigation path generates savings of 90 percent from WGI and 60 percent from the 1990 in 2010 path. (Most of this gain is also reflected in the WRE path, as described above.) It is important to keep in mind that all these cost estimates are "best case" scenarios, in the sense that they assume efficient market implementation, international trading, and full international participation and enforcement. Actual costs could be much higher if less efficient command-and-control mechanisms of implementation are used, if there is not effective international trading, or if some countries do not accede to or abide by a treaty.

What if the developing countries do not agree to go along?

It is difficult to imagine that the industrialized countries will be able to extract commitments from developing countries much more serious than those assumed in the preceding section, the Manne-Richels burden-sharing schedule. What if, as is more likely, the commitments extracted from developing countries are less strong than this, rather than more? On the one hand, as a matter of arithmetic, meeting the 550ppmv concentration constraint would require more aggressive targets and timetables on the part of the Annex I countries, if indeed it would be possible at all. On the other hand, as a matter of politics, the absence of the developing countries would probably lead the peoples of the Annex I countries to choose a less aggressive path, even though it would produce a higher terminal concentration level.⁶ (An analytical balancing of costs and benefits would give the same answer -- a less aggressive path -- once the concentration constraint is relaxed.)

To consider the possibility that developing countries might decline to participate, or decide to participate only to a lesser degree than the Manne-Richels burden-sharing formula, we ask what would be the effects, both economic and climatological, if the Annex I countries were constrained to the WRE path and developing countries do not participate (i.e., developing countries remain on their BAU path). The welfare losses (in terms of present discounted value) will depend upon whether there is trading in emission rights among Annex I countries. If Annex I trading occurs, then Annex I countries' losses increase from \$0.62 trillion to \$0.91 trillion, or 47%. If emission trading among Annex I countries does not occur, then losses rise to \$1.00 trillion, or 61%. For the U.S., in the absence of developing country participation, welfare losses rise from \$0.28 to \$0.36 trillion, or 29%, assuming Annex I trading. Without Annex I trading, U.S. losses rise to \$0.41 trillion or 46%.⁷

Even if the Annex I countries choose an aggressive path of reducing emissions 10% below 1990 levels by 2010 (and stay at that level thereafter), the effect is to reduce global concentrations only 7 % below BAU levels in the year 2100. This is less than a third of the reductions achieved when the developing countries participate [22%; conversation 8/28] This result illustrates the problem of free riding. The estimate does not include an allowance for "leakage" of carbon savings from participating to non-participating countries (e.g., reduced oil demand in the former, via a lower world price of oil, raises oil consumption in the latter). Once leakage effects are

⁶ Conversely, the developing countries are less likely to agree to participate if the Annex I countries have not already taken serious action.

⁷ For purposes of this comparison, we assume that if developing countries do participate, there will be full global trading.

added to the free-riding problem, the difficulty of accomplishing meaningful reductions without the help of developing countries are even greater. The savings is only 5 percent in this case. In other words, of the 22 percent reductions achieved when the developing countries participate, 15 percentage points are lost to free-riding, and another 2 points to carbon leakage. [conversation 8/29.]

[The difference for concentrations can be crudely translated into an estimate of the effect on temperature in 2050 or 2100 by means of simple interpolation of IPCC estimates...]



Joseph E. Aldy
09/05/97 03:20:03 PM

Record Type: Record

To: Jeffrey A. Frankel/CEA/EOP

cc:

Subject: summary table of some of MERGE outputs

These outputs are from the faxes and phone conversations with Richels.



RICHEL2.WK4

	A	B	C	D	E	F
1	Foregone Consumption (trillions\$, 5% discount rate, 1990-2100)					
2	Path	LDC Part.	Where	When	U.S.	Annex I
3	WRE	yes	global	no	0.28	0.62
4	WRE	no	annex I	no	0.36	0.91
5	WRE	no	domestic	no	0.41	1
6	Least Cost	yes	global	yes	0.124	0.282
7	1990 in 2010	yes	global	no	0.303	0.619
8	1990+10%	yes	global	no	0.293	0.564
9	1990-10%	yes	global	no	0.429	1.054
10	WGI	yes	domestic	no		
11	WGI	yes	global	no	1.28	
12						
13	Permit Prices					
14	Path	Where	When	2000	2010	2020
15	Least Cost	global	yes		2	3.4
16	1990 in 2010	domestic	no		204	
17	1990 in 2010	annex I	no		132	
18	1990 in 2010	global	no		67	88
19	1990+10%	global	no		4	65
20	1990-10%	global	no		120	112
21						
22	early runs	Where	When	2000	2010	2020
23	Least Cost	global	yes	1.161	1.998	3.48
24	1990 in 2010	global	yes	20.261	36.834	70.08
25	1990+10%	global	yes	8.247	14.929	28.208
26	1990-10%	global	yes	29.717	54.019	102.839

	G	H	I	J	K
1					
2	World				
3	0.77				
4					
5	1.57				
6	0.556				
7	0.939				
8	0.782				
9	1.276				
10	8.6				
11	3.3				
12					
13					
14	2030	2040	2050	2100	
15	5.9	9.8	20	156	
16					
17					
18				129	
19				129	
20				129	
21					
22	2030	2040	2050	2100	
23	6.126	8.129	16.445	128.394	different from
24	64.772	4.932	9.629	123.829	
25	27.954	8.115	16.447	128.388	
26	94.134	4.925	9.629	123.826	

Agenda for Climate Change

- ✓ Get Ray and Randy coordinated with EPA on drafting the "options" paper on domestic emissions paper. Representatives for EPA will be Mike Shelby (auctions) and Brian McLean (allocation). In addition to EPA, CEA, and Treasury, each team will include a representative of DoE.
- ✓ Get Toman and Hassett on board
- ✓ Paper: analogy between Kyoto and OPEC oil shocks¹

Highest priority

- Briefing for Rubin before he meets with POTUS?
- Technology paper
- Finish emissions trading "questions" paper
- Begin work on trading "options" paper

Medium priority

- Get copy of latest draft of international trading paper (Doniger), and pass it to OASIA and General Counsel's office
- What is "federal undertakings" paper about? (Goodman and Glauthier)
- Paper: relative favorability of 1990 by 2010, 1995 by 2010, 2000 by 2010, etc.
- Meetings with industry representatives (Lara)
- Decide how we want to use heavyweight consultants (and who they are). Candidates include Dick Schmalensee (MIT), Bill Nordhaus (Yale), Richard Richels (Electric Power Research Institute), Tom Rutherford (University of Colorado), John Weyant (Stanford).

¹We need to be sure that we are in step with CEA thinking on this issue. They point out a couple of distinctions: that OPEC involves a transfer of wealth abroad whereas Kyoto doesn't, except in circumstances where it is better for us to transfer than not; also, the constraints imposed by Kyoto will be known long in advance rather than hitting as a surprise.

Papers related to the Interagency Process

1. Domestic emissions trading: options paper (DW, RG)
2. Developing country commitments (RG)
3. Joint implementation and additionality (JF)
4. International emissions trading (JF)
5. Technology (RG, JS)
6. Transition assistance (?)

Other miscellaneous interagency papers

7. Relation between domestic and international emissions trading systems paper by Jim Simon of DoJ (DW)
8. Escape clauses paper by Harris (DW)
9. According to David Gardiner, Victoria Greenfield in Eisenstat's office is working on a separate paper dealing with *economic* aspects of escape clauses. We need to engage on this.
10. An escape clause paper to be written by OEP
11. Competitiveness/trade issues paper by Orszag

1. Domestic emission trading

Tasks

- a. Get Toman and Boorstin plugged in on this ASAP (DW)

Proposed outline of paper:

Throughout, the paper must lay bare the costs associated with each of the options in a hard-headed fashion.

- a. Should be a national market for a homogeneous commodity: x tons of CO₂ equivalent (explain why)
- b. Specification of GHGs to be covered
- c. Permit-holding requirement should be imposed far upstream (explain why)
- d. Possible methods of initial distribution
- i. Auction: must make the argument that with pre-existing distortions, a program of control will be extremely costly unless permits are auctioned and revenues are recycled.
 - ii. Administrative
 - iii. Re: performance standards: this is not being presented as an option because there is a consensus that either of the first two methods is superior (give a strong statement why, drawing on the Executive Summary of the first paper)
- e. Trading: central exchange *à la* SO₂
- f. Length of permits: one year (?)
- g. What to do with auction revenue
- i. Get Tax Policy participation on this
 - ii. Include rationale for why auction proceeds should not be used to promote R&D or diffusion of existing technologies (borrow from paper RG is writing on Technology)
- h. Monitoring/compliance issues?

2. Developing country commitments

a. Construct a set of baselines that will neither constrain growth greatly nor transfer an enormous volume of resources abroad. (This would start by constructing a “business as usual” baseline.) (LARA)

b. Is this the place to make a strong case on eliminating subsidies? Coordinate with JF.

3. Joint implementation and additionality

a. Is World Bank working on this issue? (BEN)

4. International emissions trading

a. We are also listed as co-authors on this, again along with Doniger. Have we engaged? A draft allegedly will be distributed August 13.

b. Does a preliminary draft exist? If so, critique it.

5. Technology (RG, JS)

Tasks

- a. Get Bob Boorstin involved in this.
- b. Let T.J. know we will be writing our own paper.
- c. Is there any point in having a further conversation with Gotbaum?
- d. Find out who economics reviewers were. We think Abe Haspel was one, but we need to know who the others were, and get their comments if possible.
- e. Get more reviewers: Kevin Hassett for sure, possibly others including Dale Jorgenson, Howard Gruenspecht, ...
- f. **We really need to get moving on this topic. As you know, PCAST and DoE Labs are preparing reports to the President for October 1 delivery. We need to see drafts of these reports.**

Proposed outline of paper

Message: Technology is good; here's what technology can realistically be expected to accomplish.

- a. Explain why we think the "Five Labs" study is not credible
- b. Define the proper scope for government involvement in the development of technology (essentially what Robert has already written)
- c. Discuss why we think the enthusiasts claims are wrong: hurdle rates *should* be high (Pindyck in irreversible investment), and engineering estimates routinely promise too much (Metcalf and Rosenthal).
- d. Very sketchy (and possibly confused) notes of conversation with LS:
 - i. OMB paper substantially overstates...
 - ii. Doesn't recognize that there would be major questions of implementation; e.g., any effort to mandate adoption would run into a variety of problems;
Need some concrete examples: tangible bad consequences
 - iii. Call Paul Portney, Schmalensee, Joskow, others who understand why CAFE is bad, and get them to help us transfer arguments to this case.
 - iv. Talk to industry

10. Economic aspects of escape clauses (DW with Ukockis)

Tasks

- a. Make contact with Victoria Greenfield, and see what she's doing.
- b. Points to be made: escape clause utilization should be short-lived: If you find that you're "escaping" every year for 10 years in a row, the mechanism probably isn't designed correctly.
- c. How do we think about the cyclical aspects of this? If the economy booms, it can be argued that (i) that would be the time that we could *best* afford to control carbon emissions, so a high price is appropriate; (ii) the high price of permits would help restrain the economy.

Miscellaneous Memos not related to the Interagency Process

1. (*Squitieri and Lutter*) What would Kyoto mean for real families? Suppose we do 1990 by 2010; how much will the annual bill for fuel oil go up for the average family that heats by fuel oil in the Northeast? How much will the annual bill for electricity go up for the average family that has central air conditioning and lives in the South or Southwest? How much will the annual bill go up for the average family that heats with natural gas and lives in Michigan or Wisconsin?

What will Kyoto mean for average annual driving expenses?

What will Kyoto mean for the average price of a flight from New York to LA? From Chicago to Houston?

2. (*Lutter and Squitieri*) What is the age distribution of coal-fired electricity generating plants? How much does it cost to retrofit a coal-fired plant so that it can burn natural gas? How much would it cost to retrofit every existing coal-fired plant this year? Suppose we extend the horizon to five years, and retrofit only the plants that remain in service at the end of that period? Ditto for 10 years, 20 years. In general, the goal is to explain why giving a long lead time helps: Synchronizing with the normal turnover of the capital stock. Any other information you can provide that is relevant to "tracing out the marginal cost curve" would be great.

3. (*Lutter and Squitieri*) What is the age distribution of nuclear plants? How much will carbon emissions increase if every nuclear plant currently in operation is retired from service according to current schedule and is replaced by a natural-gas-fired plant of equal capacity?

4. (*Gruber*) Nordhaus's argument that achieving 1990 levels by 2010 is worse than doing nothing.

5. (*Kitchen, Squitieri, Shogren*) For a given *concentration* level in 2100, calculate

- i. the optimal unconstrained path
- ii. the optimal path conditional on returning emissions to 1990 levels by 2010
- iii. the optimal path conditional on stabilizing emissions in 2015

6. (*Kitchen, Squitieri, Shogren*) Calculate the path of temperature under the Frankel plan, and compare it to (i) baseline, (ii) return emissions to 1990 levels by 2010

7. (*Kitchen, Squitieri, Lara, Ben*) How large will the financial flows be between Annex I countries?

8. (JF) Options to increase credibility

e.g., talking about permits and their implications

9. (JG, Boorstin, Williams) Issues of political economy

What are the politics of auctions versus administrative allocation? What are the politics of alternative methods of administrative allocation? Who are the various constituencies, and what are their relative strengths? Will a politically feasible scheme end up looking like the “windfall profits” tax of the 1970s?

10. What will the incidence be of a permits program? What does it imply, for example, for the utility bills of the poor? Who will bear the cost in utilities sector: stockholders? Workers? Ratepayers?

11. A study of the EU bubble and the advantage it gives them.

--



Jason Shogren

08/21/97 10:11:00 AM



Record Type: Record

To: Jeffrey A. Frankel/CEA/EOP, Michele Jolin/CEA/EOP, Randall W. Lutter/CEA/EOP, Joseph E. Aldy/CEA/EOP

cc:

Subject: agenda for climate change work

----- Forwarded by Jason Shogren/CEA/EOP on 08/21/97 10:10 AM -----



JONATHAN.GRUBER @ MS01.DO.treas.sprint.com

08/21/97 09:53:00 AM

Record Type: Record

To: Jason Shogren

cc:

Subject: agenda for climate change work

Date: 08/21/1997 09:46 am (Thursday)

From: Jonathan Gruber

To: squitierir, muldoonl, gillinghamr, wilcoxd, robertsjoh, shogren,
jonesb

Subject: agenda for climate change work

Folks -

Here is an agenda for what remains of our climate change work, at least for August. This is based on the treasury/CEA meeting yesterday. Jay, could you please pass this on to others at CEA. Comments on anything that I have left off, or on misplaced responsibilities, would be appreciated. But I am pleased that this seems (to me at least) a manageable set of tasks - although that's easy for me to say since I'll be on vacation next week!

In terms of Treasury folks, the basic responsibilities break down as:

GRUBER - comments on various papers, incidence work

SQUITIERI - domestic emissions options, targets and timetables

GILLINGHAM - technology

ROBERTS - modelling targets and timetables, international flows memo

WILCOX - comments on various memos

JONES - incidence work, Nordhaus summary

MULDOON - political economy summaries

Joint Treasury/CEA Climate Change Agenda - August 22, 1997 - annotated

I) Domestic Emissions Trading

A) Strategy: should we permit EPA to include third option?

Larry's response: we should follow the following strategy:

1) Work inside EPA to get them to kill this internally. This should proceed through Gardiner. WILCOX should take the lead on this.

2) If not killed internally, we should insist that if it is included as a third option, it is prefaced by a statement of the type "This option is completely opposed by the economic agencies".

B) SQUITIERI continues to work with EPA to refine the options that are included (at least auction and allocation, perhaps hybrid depending on (A)).

C) SQUITIERI arranges discussion of auction mechanism with Kwerel and/or other auction experts as soon as possible.

Product Goal: First draft of options paper by 8/29

II) Technology

A) GILLINGHAM and SHOGREN send comments to DoE on 5 labs study - DONE

B) GILLINGHAM, SHOGREN, and FRANKEL peruse DoE's response to our comments, and give signoff (or not) to 5 labs study

C) GILLINGHAM and SHOGREN work on broader technology paper.

D) Try to check in with TJ Glauthier to see what he envisions for technology options paper - make sure that it reflects our concerns, as laid out in our broader paper - GILLINGHAM

Product Goal: Finalized version of broader technology paper by 8/29

III) Targets and Timetables

A) FRANKEL, SHOGREN, SQUITIERI, and ROBERTS work with modellers to get runs of different paths of emissions, producing data on concentrations, temperatures, and costs to the economy (CEA is leading on this - rough draft of memo exists).

B) JONES writes up a summary of the Nordhaus argument that 1990 by 2010 is worse than nothing. ——— 10/1/97

Product Goal: Have rough drafts of memo on targets and timetables by 8/29

IV) Other Analytics

A) MULDOON works on effects of policies on the typical family.

B) ~~SANTEBASAN~~ ^{FRANKEL} works on age distribution of plants, coal and nuclear (mostly done, incorporated in Frankel T&T memo).

C) GRUBER and JONES work on incidence (JONES is doing memo for early next week - should pass to WILCOX for review).

D) ROBERTS works on memo on size of financial flows

E) MULDOON works on political economy lessons from BTU tax and Carter oil allocation scheme.

part of the part of T&T

Product Goal: Have at least rough drafts of memos on each of these topics by 8/29

V) Other Papers

A) Developing country commitments

B) JI and additionality

C) International Trading

- GRUBER rough comments passed on to WILCOX on 8/22. OASIA is working on providing comments - e-mail with some comments from Truman Semans has been forwarded.

D) Escape clause - GRUBER comments passed on to Victoria Greenfield. FRANKEL working on analytics of when we would need escape clause - WILCOX and others should consult with him on this - this could be a big issue.

E) Paper by USTR on Domestic Implementation and Trade - ROBERTS and WILCOX to provide comments by 8/29.

F) Paper by Justice on relationship between international and domestic trading - WILCOX to check on status and provide comments early in week of 8/25.

G) Competitiveness paper - WILCOX to check on status and provide comments by 8/29

H) Pomerance and Hunker have been tasked to produce a paper on negotiating implications of different targets and timetables by 8/22 - WILCOX to check on status and provide comments by 8/29 (perhaps tied to what we find from analysis in III)

I) Federal Undertakings paper due 8/29 - WILCOX and/or GRUBER to provide comments week

of 9/1

J) Early credit memo from Orszag - GILLINGHAM and/or WILCOX to provide comments on Monday, 8/25.

Agenda for Climate Change

- ✓ Get Ray and Randy coordinated with EPA on drafting the "options" paper on domestic emissions paper. Representatives for EPA will be Mike Shelby (auctions) and Brian McLean (allocation). In addition to EPA, CEA, and Treasury, each team will include a representative of DoE.
- ✓ Get Toman and Hassett on board
- ✓ Paper: analogy between Kyoto and OPEC oil shocks¹

Highest priority

- Briefing for Rubin before he meets with POTUS?
- Technology paper
- Finish emissions trading "questions" paper
- Begin work on trading "options" paper *e.g. grandfather vs auction*

Medium priority

- Get copy of latest draft of international trading paper (Doniger), and pass it to OASIA and General Counsel's office
- What is "federal undertakings" paper about? (Goodman and Glauthier)
- Paper: relative favorability of 1990 by 2010, 1995 by 2010, 2000 by 2010, etc.
- Meetings with industry representatives (Lara)
- Decide how we want to use heavyweight consultants (and who they are). Candidates include Dick Schmalensee (MIT), Bill Nordhaus (Yale), Richard Richels (Electric Power Research Institute), Tom Rutherford (University of Colorado), John Weyant (Stanford).

¹We need to be sure that we are in step with CEA thinking on this issue. They point out a couple of distinctions: that OPEC involves a transfer of wealth abroad whereas Kyoto doesn't, except in circumstances where it is better for us to transfer than not; also, the constraints imposed by Kyoto will be known long in advance rather than hitting as a surprise.

Papers related to the Interagency Process

1. Domestic emissions trading: options paper (DW, RG) Tr
w/ry of
2. Developing country commitments (RG) "ok"
3. Joint implementation and additionality (JF)
4. International emissions trading (JF)
5. Technology (RG, JS)
6. Transition assistance (?)

Other miscellaneous interagency papers

7. Relation between domestic and international emissions trading systems paper by Jim Simon of DoJ (DW)
8. Escape clauses paper by Harris (DW)
- (5) [9. According to David Gardiner, Victoria Greenfield in Eisenstat's office is working on a separate paper dealing with *economic* aspects of escape clauses. We need to engage on this.
we need
w/ry to
take pen
10. An escape clause paper to be written by OEP
11. Competitiveness/trade issues paper by Orszag

1. Domestic emission trading

Tasks

- a. Get Toman and Boorstin plugged in on this ASAP (DW)

Proposed outline of paper:

Throughout, the paper must lay bare the costs associated with each of the options in a hard-headed fashion.

- a. Should be a national market for a homogeneous commodity: x tons of CO₂ equivalent (explain why)
- b. Specification of GHGs to be covered
- c. Permit-holding requirement should be imposed far upstream (explain why)
- d. Possible methods of initial distribution
- i. Auction: must make the argument that with pre-existing distortions, a program of control will be extremely costly unless permits are auctioned and revenues are recycled.
 - ii. Administrative
 - iii. Re: performance standards: this is not being presented as an option because there is a consensus that either of the first two methods is superior (give a strong statement why, drawing on the Executive Summary of the first paper)
- e. Trading: central exchange *à la* SO₂
- f. Length of permits: one year (?)
- g. What to do with auction revenue
- i. Get Tax Policy participation on this
 - ii. Include rationale for why auction proceeds should not be used to promote R&D or diffusion of existing technologies (borrow from paper RG is writing on Technology)
- h. Monitoring/compliance issues?

2. Developing country commitments

- a. Construct a set of baselines that will neither constrain growth greatly nor transfer an enormous volume of resources abroad. (This would start by constructing a “business as usual” baseline.) (LARA)
- b. Is this the place to make a strong case on eliminating subsidies? Coordinate with JF.

3. Joint implementation and additionality

- a. Is World Bank working on this issue? (BEN)

4. International emissions trading

- a. We are also listed as co-authors on this, again along with Doniger. Have we engaged? A draft allegedly will be distributed August 13.
- b. Does a preliminary draft exist? If so, critique it.

5. Technology (RG, JS)

Tasks

- a. Get Bob Boorstin involved in this.
- b. Let T.J. know we will be writing our own paper.
- c. Is there any point in having a further conversation with Gotbaum?
- d. Find out who economics reviewers were. We think Abe Haspel was one, but we need to know who the others were, and get their comments if possible.
- e. Get more reviewers: Kevin Hassett for sure, possibly others including Dale Jorgenson, Howard Gruenspecht, ...
- f. **We really need to get moving on this topic. As you know, PCAST and DoE Labs are preparing reports to the President for October 1 delivery. We need to see drafts of these reports.**

Proposed outline of paper

Message: Technology is good; here's what technology can realistically be expected to accomplish.

- a. Explain why we think the "Five Labs" study is not credible
- b. Define the proper scope for government involvement in the development of technology (essentially what Robert has already written)
- c. Discuss why we think the enthusiasts claims are wrong: hurdle rates *should* be high (Pindyck in irreversible investment), and engineering estimates routinely promise too much (Metcalf and Rosenthal).
- d. Very sketchy (and possibly confused) notes of conversation with LS:
 - i. OMB paper substantially overstates...
 - ii. Doesn't recognize that there would be major questions of implementation; e.g., any effort to mandate adoption would run into a variety of problems;
Need some concrete examples: tangible bad consequences
 - iii. Call Paul Portney, Schmalensee, Joskow, others who understand why CAFE is bad, and get them to help us transfer arguments to this case.
 - iv. Talk to industry

10. Economic aspects of escape clauses (DW with Ukockis)

Tasks

- a. Make contact with Victoria Greenfield, and see what she's doing.
- b. Points to be made: escape clause utilization should be short-lived: If you find that you're "escaping" every year for 10 years in a row, the mechanism probably isn't designed correctly.
- c. How do we think about the cyclical aspects of this? If the economy booms, it can be argued that (i) that would be the time that we could *best* afford to control carbon emissions, so a high price is appropriate; (ii) the high price of permits would help restrain the economy.

Miscellaneous Memos not related to the Interagency Process

1f ns
m
1. (*Squitieri and Lutter*) What would Kyoto mean for real families? Suppose we do 1990 by 2010; how much will the annual bill for fuel oil go up for the average family that heats by fuel oil in the Northeast? How much will the annual bill for electricity go up for the average family that has central air conditioning and lives in the South or Southwest? How much will the annual bill go up for the average family that heats with natural gas and lives in Michigan or Wisconsin?

What will Kyoto mean for average annual driving expenses?

What will Kyoto mean for the average price of a flight from New York to LA? From Chicago to Houston?

2. (*Lutter and Squitieri*) What is the age distribution of coal-fired electricity generating plants? How much does it cost to retrofit a coal-fired plant so that it can burn natural gas? How much would it cost to retrofit every existing coal-fired plant this year? Suppose we extend the horizon to five years, and retrofit only the plants that remain in service at the end of that period? Ditto for 10 years, 20 years. In general, the goal is to explain why giving a long lead time helps: Synchronizing with the normal turnover of the capital stock. Any other information you can provide that is relevant to "tracing out the marginal cost curve" would be great.

3. (*Lutter and Squitieri*) What is the age distribution of nuclear plants? How much will carbon emissions increase if every nuclear plant currently in operation is retired from service according to current schedule and is replaced by a natural-gas-fired plant of equal capacity?

4. (*Gruber*) Nordhaus's argument that achieving 1990 levels by 2010 is worse than doing nothing.

5. (*Kitchen, Squitieri, Shogren*) For a given *concentration* level in 2100, calculate

- Jay
- i. the optimal unconstrained path
 - ii. the optimal path conditional on returning emissions to 1990 levels by 2010
 - iii. the optimal path conditional on stabilizing emissions in 2015

6. (*Kitchen, Squitieri, Shogren*) Calculate the path of temperature under the Frankel plan, and compare it to (i) baseline, (ii) return emissions to 1990 levels by 2010

7. (*Kitchen, Squitieri, Lara, Ben*) How large will the financial flows be between Annex I countries?

8. (JF) Options to increase credibility f. n e c

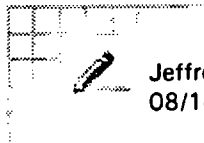
e.g., talking about permits and their implications

9. (JG, Boorstin, Williams) Issues of political economy

What are the politics of auctions versus administrative allocation? What are the politics of alternative methods of administrative allocation? Who are the various constituencies, and what are their relative strengths? Will a politically feasible scheme end up looking like the “windfall profits” tax of the 1970s?

10. What will the incidence be of a permits program? What does it imply, for example, for the utility bills of the poor? Who will bear the cost in utilities sector: stockholders? Workers? Ratepayers?

11. A study of the EU bubble and the advantage it gives them.



Jeffrey A. Frankel
08/14/97 12:08:36 PM

Record Type: Record

To: Randall W. Lutter/CEA/EOP, Jason Shogren/CEA/EOP, Joseph E. Aldy/CEA/EOP

cc: Cristian J. Santesteban/CEA/EOP, Quindi C. Franco/CEA/EOP

Subject: gcc priority

We should have by late this week a memo outlining the options regarding targets and timetables and their economic effects (and their temperature effects, as Cristian and Quindi have been doing). To recap, the economic variables are those reported in the IAT analysis, plus the magnitude of international permit trading. At the moment, the number of scenarios is too large; we will have to narrow it down. (In addition to the triple of "stabilize by 2010, 2020, or later", we have the triple of +10%, +0, or -10%, AND Larry wants to consider 1995 as the level of stabilization as an alternative to 1990.* That's too many combinations.)

QUESTION: What can we expect to have from the models, in-house or outside, by Wed. or Thurs. next week, in addition to what we already have?

Of our many high-priority tasks, I think targets and timetables is the highest.

(* I think Larry's concern is most easily satisfied by a computation of the difference in US emissions in 1995 vs. 1990, times the shadow price of carbon in our estimates, and the same for the rest of the world. Who can do this? Is Ray Squitieri already working on it?)

JF

lead 2050
1990 levels by 2020



toman @ rff.org
08/19/97 05:54:00 PM

Record Type: Record

To: Jeffrey A. Frankel

cc:

Subject: GCC workplan

August 19, 1997

MEMORANDUM FOR: JEFF FRANKEL
JAY SHOGREN
RANDY LUTTER

FROM: MIKE TOMAN

SUBJECT: CEA GCC WORK PROGRAM

As promised in my earlier memo, I would like to offer a few thoughts about the work plan as it was described to me last Friday. Let me start by saying something about my own particular biases concerning how the climate change policy issue is defined and how it can be addressed, in particular by economists. I start with the premise that economics can contribute a lot to an understanding of the issue and hence it is crucial and gratifying that CEA is so involved but that the resolution of the issue will be even more a political issue than most in the area of environmental economics. This in turn leads me to the approach to regulatory assessment laid out in the revised OMB guidelines. Those guidelines say that when knowledge of benefits, or costs, or both, is seriously incomplete and/or uncertain, the best the analyst can do is lay out what is known perhaps in some scenario analyses to inform the political decision process.

You all are much closer to the politics of this issue than I am these days, both from the standpoint of the Administration and generally. It is certainly true that Congress is unlikely (to put it mildly) to ratify any treaty that appears to impose significant costs for limited gain, or to put the US in too much of an inferior position relative to other countries. On the other hand, there is so much momentum for a medium-term stabilization goal within the environmentalist wing of the Administration and internationally that arguments to the contrary will be difficult to make in the short amount of time before Kyoto, no matter how sound they seem to us as economists.

What does all this have to do with the work plan? It seems to me that of all the tasks on the list, the most important by far is the ocompare stabilization at 1990 by 2010 with peak in 2015 and decline

thereafter job, coupled with the question of escape clauses. I think it is useful to summarize what is known from the IA literature, and from the cost-of-long-term-concentrations literature. I would think that these jobs would not be too hard, given the EMF14 study of IA models and the growing literature on long-term concentration targets. But as was noted in the discussion last Friday, enviros will remain skeptical about whether the IA literature really addresses the risks and intergenerational equity issues, and political types will (with some justification) question the utility of a policy target over 5 decades in the future.

On the other hand, the discussion about returning to 1990 levels by 2015 versus accommodating growth until 2015 and then doing more afterwards to pursue a long-term target can shed real light on the costs and benefits of options that have more potential within the current policy debate. If the opportunity for getting a hearing for economic arguments at this late date is limited, then that is where I would put a lot of my attention. My understanding is that Edmonds is doing some analysis of these options for you; and I would presume that Richels would likewise help out, if he hasn't already. As Jeff pointed out Friday, what one would like is to show that the cost savings from the moderately more delayed path are significant, and that catching up on the GHG reductions is not that hard to imagine given the right policy signals. It would also be crucial to show how the potential cost savings from the delayed abatement path depend on technical progress, with implications for the need to continue R&D on carbon-saving technologies.

The Achilles tendon on all these delay arguments, as you know, is the dynamic inconsistency problem. It seems to me that if one takes the OMB-like approach of laying out all the costs and benefits, and the uncertainties, one needs to acknowledge that there is some probability that some promised reductions in future GHG emissions will not be realized. One needs to go further to attack a very hard problem, namely is there some way to reduce the time-inconsistency? For example, could a deal be struck with utilities (major beneficiaries of the delay strategy) to give them intertemporal flexibility but put some of the fruits in escrow (e.g., delay in stranded cost relief)? Could they be bonded in some other fashion? Could interim reductions in the rate of growth, and inducements for early emissions reductions through bankable credits, help build confidence? A basic part of my argument is that in dealing with this issue, one cannot entirely separate the target/timetable debate from the implementation debate.

Another important aspect of the issue is showing that the consequences of delay are manageable given some longer-term concentration goal. For example, if I understand Manne/Richels right, GLOBAL emissions must peak in 2050 to hit 550 ppm (actually more in GHG-equivalents when other gases are taken into account), not just US emissions. What can analysis say about how delay in the downturn of US emissions might affect achievement of the global stabilization? (Some analysis of different emissions trajectories by OSTP speaks to this.) Would the delay in the global stabilization be minor, thus having little effect

on long-term concentration, or would it be bigger?

That leads in turn to the escape clause issue. I think this is important and unappreciated, and I think it is great that it is on your agenda. Do you have any ideas yet? One simpleminded answer is that one would eschew QELROs entirely and implement a carbon tax (the Weitzman argument), but realistically I doubt that would go anywhere.

(On the other hand, if the President REALLY wants to lead on this issue, why not challenge the Europeans and Japanese to join the US in imposing a moderate carbon tax within 2-4 years, to see what happens?

Ours of course could be packaged with revenue-neutral recycling.) I think it is also important to think of escape clauses that apply if, as a cynic would suspect, other Annex 1 countries are more talk than action on their GHG limits. Somehow our willingness to be bound by a legal limit needs to be explicitly tied to other countries' performance to strengthen incentives against shirking over time.

As far as the technology/free lunches item goes, I certainly agree with the need to continue laboring away on the counter-message (and David Wilcox at Treasury has put together some important recent literature that will help). Here again, though, I am not sure what the short-term payoff will be given the theological nature of this debate. Perhaps the best that can be hoped for (and this is no small thing) is to point out how sensitive the cost estimates are to assumptions about technical progress (in any economic modeling platform, not just the IAT ones), and that there is considerable controversy about how much induced technical change will be delivered. Just as important, as was noted Friday, it would be extremely useful to get behind the basic notion that technical advance is crucial to long-term management of the global warming risk, BUT that progress will not happen magically. This would dovetail with OSTPA's agenda for continued research support of promising technologies, while emphasizing the need for concrete policies to induce changes in innovation and technology diffusion behavior. (I actually think that there will be no real solution to this policy problem unless technology progress makes it less of a hair-shirt proposition, or unless we really do discover a catastrophe waiting in the wings.)

One lower-level item on the agenda is how to deal with the possibility of a climate disaster. I am not sure how much literature you have assembled on this issue, but I have just discovered that there is a considerable amount. If you do not already have this, and you want to pursue this point further, I would be happy to try to pull the relevant papers together.

One last general point having to do with analytical strategy. I know from experience that there is usually not time to do pretty-bow work, and that various shortcuts (extrapolations, stylized assumptions, etc.) have to be used. For better or worse, however, much of the climate debate is dominated by fairly complex energy/economic models and people with a great deal of experience using these models. This is in part because there is a legitimate danger that more ad hoc approaches will be misspecified. Even if this weren't an important

concern, there may be problems establishing the credibility of analyses that are too quick and dirty.

For example, take the idea that abatement cost can be approximated by the area of a triangle whose height is \$100/ton and whose length is the amount of emissions reduction. A linear marginal abatement cost curve is only one possible assumption and seems more defensible a priori than others if one put any stock in the technologists' view, in fact, something more convex would seem better. So suppose one specified the marginal abatement cost to be $100x^{1+a}$, where x is the fraction of total targeted emissions reductions so $0 < x < 1$. The area under this curve will be quite sensitive to the magnitude of the exponent a .

All this is not to diss entirely the value of quick analyses, but to the extent possible I would try to use model results such as those you are requesting from Edmonds and Richels. Though time is limited, others could be asked to contribute as well (e.g., Goulder, Nordhaus, Pizer, Shackleton). The results of utility sector models could be used to give you a better picture of what kinds of capital stock turnover is sensible under different conditions, with less dependence on ad hoc assumptions and/or an easier time of ascertaining how such assumptions can drive results.

That is about all I want to say about the work plan itself. I hope these comments are useful. At this point I need more guidance from you about how I might be useful. I could, for example, assist in some way in the consideration of the delayed reductions policy options. I might also be able to help pull some information together about analyses with a catastrophe probability. I look forward to hearing from you. Thanks.

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Jeffrey A. Frankel
08/13/97 10:32:58 AM

Record Type: Record

To: Randall W. Lutter/CEA/EOP
cc: Joseph E. Aldy/CEA/EOP, Jason Shogren/CEA/EOP
Subject: GCC: another analytical task to add to our list

We may need estimates of likely value of permits traded internationally, circumstances determining US buyer or seller, and US value of permits traded. There was a bit on this in the IAT; but we want also to use G-cubed and other sources, including back-of-the-envelope calculations of our own.

Priority: not as urgent as the couple of top-priority tasks we have discussed. But it goes on the list.
thanks
JF

Tasks To be done

Optimal path
peaking in 2010-2020

~~100%~~

LDC formula

Jay S

Randy L LDCs

Joe Aldy 5-Subs

regv. Quinlan Consideration

IRA interns
Braun oil & coal Manly
of R & D & coal

Samuel Soc Sec
Carmel

Incidence

Joe Aldy

EEI

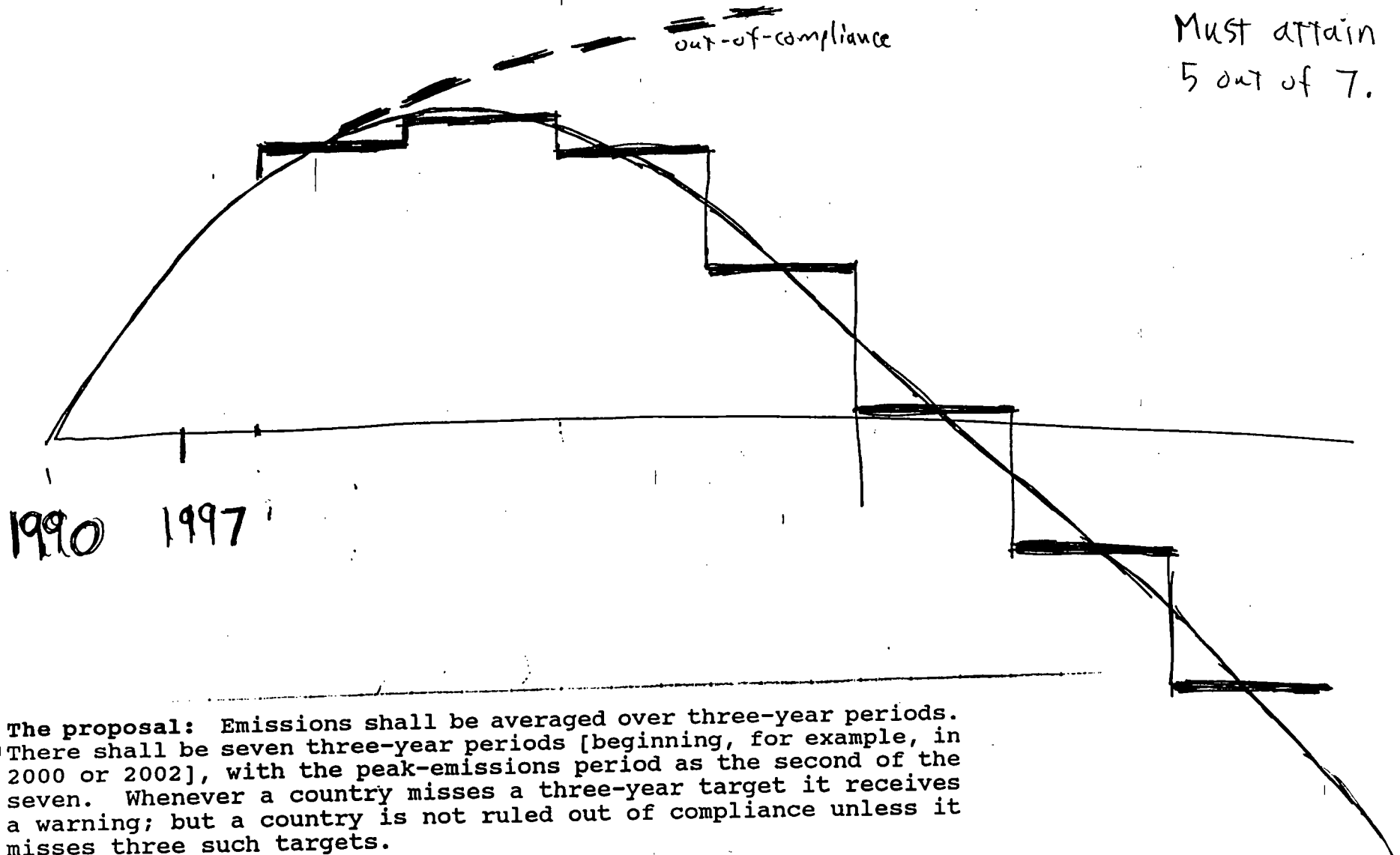
Match soc. sec. needs with carbon revs. path over time.
2.23% payroll tax

Compute revs
from somebody's
forecasted path

Figure out $2 \times 2 \times 2$ or $3 \times 3 \times 3$ model

Frankel proposal: 7x3-yr.

Must attain
5 out of 7.



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.

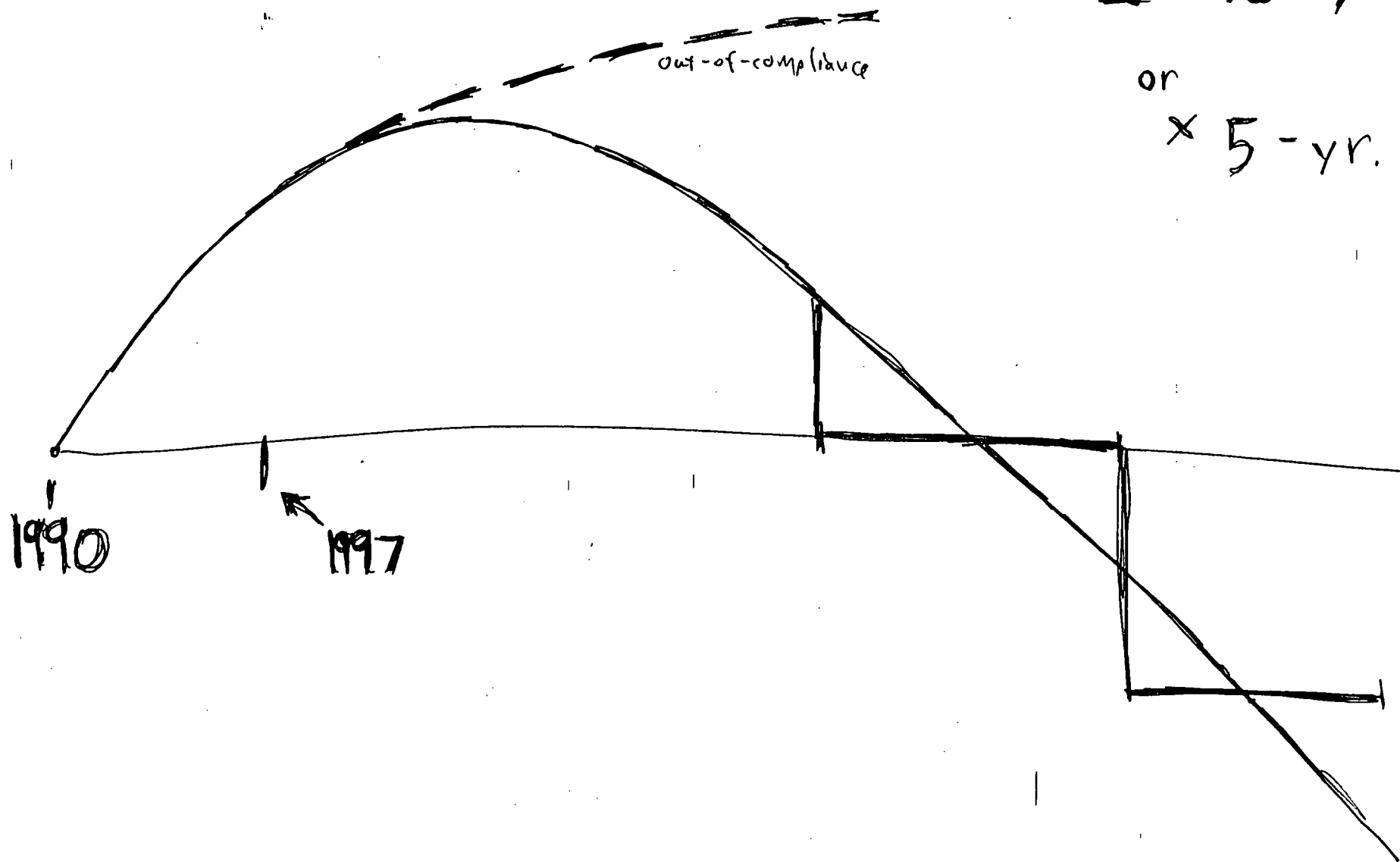
In other words, the binding requirement is to hit at least 5 of the 7 targets. Thus a country receives a clear warning at a stage when it is still feasible to get back into the system.

Existing plan:

2×10 -yr.

or

$\times 5$ -yr.



GA CC

NEED

Equivalent of \$100/ton
carbon tax

It could be smaller with the modeling. It

to reduce emissions to 1990 level

Energy
GDP

different countries

different prices

Alina

Tim Wirth told Garry

Gla

Don't worry

if no political consent for any of the
options being discussed

Kyoto

Admission was not
sure anything can be done.

~~GA CC~~

Ray

what do the models

9/13/97 draft

FEDERAL GOVERNMENT LEADERSHIP on ENERGY AND CARBON EMISSIONS REDUCTIONS

The Federal Government has a record of accomplishment in improving energy efficiency and reducing carbon emissions in its own facilities and vehicles:

- Energy efficiency in federal buildings has improved so that energy use per gross square foot has declined 8% from 1990 to 1996
- When combined with federal government downsizing, total energy usage in buildings is down 15% in that same period
- Energy use in federal vehicles and equipment dropped 21% during that same period
- Overall, the federal government's total energy usage in 1996 was 18% below 1990 levels
- Carbon emissions from the federal government's energy usage has also declined by ...% from 1990 to 1996
- With an energy bill of over \$11 billion in 1990, the federal government brought that down to \$8 billion in 1995, saving taxpayers over \$3 billion per year

Now, the federal government could undertake a "[7] point plan" to continue this leadership over the next decade, to keep the government's energy use and carbon emissions below [1990 levels] by [2010].

Options for the actions that could be included in such a plan have been identified by an interagency working group and are in the process of being refined. A working draft is attached.

Proposals for Improving Federal Facility Energy Efficiency and reducing Carbon Emissions

The following ideas for Federal Energy Efficiency are split into "A" and "B" lists. The "A" list represents ideas that appear to have good potential as a Presidential initiative. The "B" list items are lower priority or not as fully developed. Those with a check in front of them have been written up in "one-pager" format and are attached. Those with an "r" in front had a one-pager, but it needs to be rewritten due to consolidation of proposals or a shift in focus.

"A" List

1. ✓ **Promote the use of ESPCs and disseminate guidelines for scoring.**
2. ✓ **Reinvent Federal Procurement**
 - **Training and Outreach:** Publish best practices guide on buying for the environment (FEMP/OFPP). Expand government-wide training on energy efficiency -- both buildings construction and energy-efficient products. Sponsor another "Buy Environmental" trade fair similar to the one held for recycled products in 1992.
 - **Practices and Procedures:** Establish FEE-led or OMB-led interagency implementation group, which would review management directives and edit, update, and consolidate Executive Orders on energy and the environment to the maximum extent practical. Use alternative contracting vehicles to acquire energy efficient and environmentally-preferable products. Specify purchase of products in the top 25 percent of class for energy efficiency or conforming to Energy Star standards whenever possible. Raise the visibility/placement of the Federal Environmental Executive -- move to CEQ -- and expand the FEE's role to include energy efficiency. (DOE, EPA)
3. r **PNGV-like programs for large engines (DOD).** medium and heavy diesels, managed by DOD/TACOM (Tank and Automotive Command), and turbines for aircraft, managed by NASA and DOD.
4. r **Sustainable design for Federal facilities.** This would include:
 - "Cool Communities" strategies (reflective roofs, additional trees, lighter-colored paving),
 - passive solar designs,
 - increased use of geothermal heat pumps,
 - increased use of and solar and renewable energy, and

- increased use of combined heat and power systems.
5. **Million Solar Roofs.** Federal facilities will participate in the Million Solar Roofs program
 6. **Consolidation, demolition, and recycling of excess military facilities (DOD).**
 7. ✓ **Allow ESPCs to be used for all facilities where Federal funds pay the energy bills even indirectly (i.e. public housing). (DOE)**
 8. **Continued downsizing of the Federal government**
 9. **Use popular National Park facilities as energy efficiency demonstration and education sites**
 10. **Executive Order for agencies to reduce carbon emissions**

“B” List

1. ✓ Restore some direct Federal funding for energy-efficiency projects (\$150-200 million).
2. Create a “Cool Roofs” initiative (a subset of Cool Communities type activities) for smaller government offices and residential facilities. (Big office buildings don’t have a large enough (roof area)/(building volume) ratio for this to make much difference) (EPA).
3. ✓ Improve coordination across many programs and agencies that have a significant impact on Federal energy expenditures: Weatherization, LIHEAP, housing subsidy program, Bureau of Indian Affairs. (DOE)
4. Increased use of combined heat and power at Federal facilities (EPA).
5. ✓ Support the use of State Grant funds to facilitate use of ESPCs and utility financing by State governments wherever possible. (The States can use the grant money for this purpose already, so there’s not much new here.) (DOE)
6. ✓ Create a FEMP “SWAT” team that would provide consulting on energy waste and would be paid from a fraction of the savings they deliver to the client agencies. (DOE)
7. ✓ Support an Energy Bank bill to provide a revolving fund for energy-efficiency investments in Federal facilities. (DOE)
8. ✓ Allow sale of electricity from any Federal facility that can support a cogeneration load. (DOE)
9. ✓ Support bulk (guaranteed) procurement of energy-efficient equipment to provide an incentive for manufacturers to begin production of advanced products. (DOE)
10. ✓ Allow ESPCs to be used for mobility energy (i.e. ships, planes, trucks). There are two interpretations for this. A tight definition just expands ESPC use to ships for “hotel load” energy use -- HVAC, laundry, lighting, etc. A broad definition would allow ESPC financing for retrofitted/new trucks and propulsion energy on ships and planes. (DOE)
11. ✓ “Green Power” Purchasing: include a requirement for some renewable energy in power purchase contracts.

"A" List Background Papers

These papers provide details about the initiatives on the "A" list -- i.e. those that are the best candidates for announcement as Presidential initiatives.

Initiative 1: Promote the use of ESPCs

Short Title: Promote the use of Energy Savings Performance Contracts (ESPCs) at Federal facilities.

Description: ESPCs allow Federal facilities to have energy efficiency improvements made and financed by private-sector contractors, with the investment repaid through payments based on the energy savings that are achieved. Such contracts are currently in use, but not yet widely. This initiative would promote the use of ESPCs and would provide specific guidance on scoring, desirable terms, etc. to ensure that agency procurement officials feel comfortable with the process and understand that it is approved by OMB.

- Agencies will have to score the full potential liability (total payments under the contract) as advance contract authority, but will only need to have appropriations in hand sufficient to cover the first year's payments.
- Because of long-term uncertainty over government downsizing and the potential for changes in facility usage, OMB recommends ESPC contingent liability periods of no more than 7 years. ESPCs with contingent liability periods extending more than 7 years should undergo a review by senior-level agency management.

Potential Benefits: Somewhere between \$3 billion to \$6 billion of investments are needed in Federal facilities to achieve the Administration's efficiency-improvement goals. It will be difficult or impossible to finance that through direct appropriations, so ESPCs will be needed as the major funding channel. The efforts are intended to reduce Federal energy consumption per square foot of non-industrial facilities by 30 percent by 2005, relative to a 1985 baseline. (We have already achieved about a 15 percent reduction.) This will translate into a savings of about \$500 million per year compared to current levels of energy spending.

Affected and Lead Agencies: OMB to issue guidance and encouragement to agencies. DOE and DOD to continue with multiple-award contracts ("super ESPCs") that will allow individual ESPC projects to be awarded with only "mini competitions."

Potential Problems and Costs: The government will be exposing itself to contingent termination-cost liabilities in the off chance that the government decides to close or dispose of a building where ESPC improvements have been made. The probability of this occurring in any given ESPC facility is judged to be sufficiently small that the policy as a whole is still very beneficial. Agencies will have to seriously consider the expected use of a facility over the life of a proposed ESPC, however.

Initiative 2: Reinvent Federal Procurement

When Federal energy managers are queried about problems or barriers to implementation, inevitably, they often identify procurement and policy constraints as major obstacles to accomplishing their job. The following management and procurement initiatives are recommendations to boost and highlight the Federal Government's role as a leader in responsible energy spending and make it easier and cheaper to get results.

- Develop a Best Practices Guide on Buying for the Environment to serve as a resource for agencies to use in establishing new programs for conserving energy and purchasing efficient quality products or services at the lowest cost but with the highest rate of return.
- Establish a high level interagency implementation group on "Federal Energy Consumption" headed by OMB to address policy concerns and assign initiatives for wide-spread implementation
- Encourage/Direct systematic reviews of agency building specifications and design, facility management and other management directives and training materials and eliminate existing biases that inhibit the purchases of energy-efficient products and services
- Expand and publicize available training initiatives on energy efficiency by subsuming and highlighting the importance of energy conservation issues in existing management training programs to make scarce training dollars go further.
- Consolidate Executive Orders...a single point of contact for implementation concerns, reporting, and coordination of the *five* White House awards programs established by them will facilitate implementation, information dissemination and get more exposure for results attained in the Federal agencies.
- Establish and make better use of contracting vehicles for green purchasing. By establishing more multiple award contracts (MACs) and GSA multiple award schedules (MAS) for energy products and services, and by modifying GSA Advantage (an on-line catalog) to highlight them, Federal agencies could procure energy efficient products and services faster and cheaper.
- Develop targeted monetary and non-monetary incentives to prompt both program and contracting personnel to acquire more energy efficient products and services, without undermining competition or value.

These recommendations and initiatives would go a long way in reinvigorating lagging federal implementation of energy conservation and environmental programs. Although consensus still needs to be reached on some details of the approaches, implementation could begin immediately

and possibly be accomplished within the next six months. High-level involvement and attention from OMB should prompt more aggressive action Government wide.

Initiative 3: PNGV-like programs for large engines

- 1. Short Title:** Partnership for Next Generation Compression Ignition Engine
- 2. Brief Description:** Establish consortium of medium/heavy diesel engine manufacturers and research organizations, to include commercial, academic and government laboratories, with the expressed purpose of accelerating technology transfer of advanced compression ignition engine technologies from research to manufacturing. The consortium shall function to (1) assure a strong competitive U.S. diesel engine and commercial heavy vehicle industrial base, (2) develop the most environmentally compliant and fuel efficient compression ignition engines that are technologically achievable and (3) integrate unique military engine performance / configuration requirements into commercial designs to ensure a common industrial base.
- 3. Potential Benefits:** Coordination of non-competitive research related to diesel engine technologies will promote resource leveraging and more efficient applications of advanced technologies. Promoting direct interaction of manufacturing elements in advanced research planning and execution will accelerate technology adoption, thereby making fleets more fuel efficient and environmentally compliant in an accelerated time frame, while making research more relevant to customer needs. Government consortium sponsorship will enable greater influence over direction of technology R&D and allow DOD to buy and support future engines with minimal modifications, making both production and logistics considerations more cost effective.
- 4. Affected and Lead Agencies:** Affected Agencies should include Department of Defense, Department of Transportation and Department of Energy. The lead agency should be Department of the Army, U.S. Army Tank-automotive and Armaments Command (TACOM), Tank Automotive Research, Development and Engineering Center (TARDEC), National Automotive Center (NAC).
- 5. Potential Problems & Costs:** Problems include (1) Collaboration and sharing of advanced technologies amongst competitive medium/heavy engine and heavy vehicle manufacturers, (2) Integration of unique military engine requirements (i.e., power density, configurations, etc.) into commercial designs that are driven by market forces and (3) Uncertainties related to future fuel types and standards (e.g., uniformity).

Intitiave 4: Sustainable design for Federal facilities

Short Title: Sustainable Design in Federal Construction

Brief Description: Sustainability applies to both individual building design and to entire community or campus/base designs.

- A sustainable building is designed to be energy efficient, easily maintained, and environmentally responsive. It is characterized as being thermally efficient, using renewable energy sources, restricting on-site water consumption, using recycled materials, minimizing waste products, avoiding contaminants, and providing clean indoor air conditions. It is also built as much as possible with recycled or recyclable materials. These objectives are typically realized by employing state-of-the-art and innovative building technologies that have been selected considering life-cycle costs.
- Sustainable development concepts for a Federal campus or military base include "cool community" initiatives, such as light-colored roofs and paving, the planting of additional trees, use of native plant species and low-chemical landscaping, and community systems such as district heating and cooling, environmentally-friendly water treatment, building layouts that minimize traffic and the need to drive, and possibly the use of innovative on-base/campus transportation systems.

Ongoing Activities: GSA is currently developing "green" design concepts. Using an actual courthouse project as a model, a panel of industry experts in sustainable design has developed recommendations for sustainable courthouse design. Currently, we are evaluating the costs and potential benefits of these recommendations in order to provide an economic basis for "green" design decisions. The recommendations and analysis will be used to revise the GSA Facilities Standards document. TVA has incorporated Sustainable Architecture in the holistic design of their Facilities Services Environmental Program that has resulted in: 81.5 % reduction in office waste to landfills; the purchase of 8M dollars worth of sustainable and recycled content building materials; 5,008 cubic meters of renovation waste diverted from landfills and the reduction of energy requirements by 22.7%.

Potential Benefits: Sustainable design should result in facilities that are life-cycle cost effective due to lower energy costs, offer lower maintenance costs, and result in less environmental degradation. Energy savings should be able to reach 30 percent relative to today's conventional practices. As Federal facilities generally have a life expectancy of over 50 years, these results have significant long term benefits to the Government and the country.

Affected and Lead Agencies: All agencies employing GSA design and construction services will benefit from sustainable design. Agencies that should take the lead and coordinate findings are those who have significant construction activity, including GSA, Department of Defense,

Department of Energy, Department of Veterans Affairs, Postal Service, Department of Interior, and Department of State.

Potential Problems and Costs: Sustainable design may have higher initial costs than conventional building construction, although on a life-cycle basis it should cost no more, and probably less. This will require a training and policy emphasis on life-cycle cost approaches to construction planning and budgeting. Effective commissioning practices, throughout the delivery process, must be offered to insure that expectations are realized, especially through Value Engineering and other design phase evaluation/selection practices.

Initiative 5: Federal Participation in Million Solar Roofs.

Short Title: Million Solar Roofs Program

Brief Description: On June 26 President Clinton announced the Million Solar Roofs Initiative. This Initiative will partner the Federal government with businesses and communities to install solar systems on one million roofs in the U.S. by 2010. The Department of Energy will lead the initiative to work with local partners to remove market barriers and strengthen demand for building applications of solar technologies. Agencies will be asked to lead by example and participate in local programs and maximize use of cost-effective solar technologies in Federal buildings.

The Federal sector is the largest single user of energy in the country and pays over \$3.8 billion annually to power and space condition 500,000 buildings. Within this building stock there is a potential to install large numbers of cost effective solar thermal and electric energy systems. These systems include photovoltaic systems, solar concentrating systems for heat and electric power, solar flat plate systems for hot water heating, solar air heating systems, and solar swimming pool heating systems. FEMP currently plans to fund the installation of the majority of these systems through a number of energy savings performance contracts targeted toward specific technologies. This will allow the private sector to finance and install these energy and cost saving systems and be reimbursed from the energy savings that they deliver to the facilities. Current FEMP contracting plans call for the following contracts to be put in place over the period from 1996 to 1998.

Solar Thermal Concentrating	\$30 million	Awarded
Photovoltaics	\$50 million	In process
Solar Air Heating	\$30 million	Award in FY 1998
Solar Thermal (flat plate, etc.)	\$50 million	Award in FY 1998
Solar Swimming Pool Heating	\$30 million	Award in FY 1998

In total these contracts will be valued at \$190 million. Additional contracts can be awarded where the contract value is exceeded for any given system.

In addition, FEMP intends to identify the most likely systems for repeat installation in Federal facilities and to provide packaged procurement specifications and catalogue listings so that agencies can buy the systems using available appropriations and purchase orders which include installation and checkout services. Combined with the ESPC purchasing above, the penetration of the solar systems should reach a total of 20,000 units in 2010. This is roughly the same percentage of the total 1,000,000 roof goal as the Federal energy use is to the national energy use, or 2%. It represents a larger percentage (4%) of Federal solar roofs delivered as a part of the

number of Federal roofs available when compared to the percentage (1.5%) of non-Federal solar roofs as part of the available roofs in the general population.

Potential Benefits: Reduce local emissions of CO₂, SO₂, NO_x and particulate matter. Increased local employment in solar deployment fields. Reduced energy costs, particularly in areas with high-utility rates or local incentives such as net-metering.

Affected & Lead Agencies: DOE, DOD, HUD, EPA, USDA, DOI, DOJ

Potential Problems and Costs: Contracting approval for periods over ten years.

Initiative 6: Consolidation, demolition, and recycling of excess military facilities

Initiative 7: Allow ESPCs to be used for all facilities where Federal funds pay the energy bills, even indirectly (i.e. public housing)

Short Title: Allow ESPC/FREE Savings to be used for all facilities where Federal money supports the energy bills even indirectly (i.e. public housing rent subsidy payments)

Brief Description: Current Federal mandates for agencies require only that they save energy in Federally-owned and leased facilities. Agencies have begun to adapt to the lack of appropriations and substituted ESPC to capture the existing energy savings in those Federal buildings. There are several Federally subsidized buildings where the owners have been encouraged to enter into ESPC contracts as a mechanism for cutting energy use and lowering the subsidy required. In general, this has met with limited success, in part, because the facilities have limited expertise in the contracting process. However, the use of Federal ESPC expertise and contracts in federally subsidized buildings could rapidly expand the energy and cost savings in those buildings.

Potential Benefits: Increase cost and energy savings could accrue to the taxpayers and better living conditions could be provided to the citizens of subsidized facilities.

Affected & Lead Agencies: DOE, HUD, HHS, SSA, BIA

Potential Problems and Costs: More complex business environment would drain existing senior resources from other Federal priorities for a short time. Legislative change required.

Initiative 8: Continued downsizing of the Federal government

Initiative 9: Use popular National Park facilities as energy efficiency demonstration and education sites

Initiative 10: Executive Order for agencies to reduce carbon emissions

"B" List Background Papers

These papers provide details about the initiatives on the "B" list -- i.e. those that are less likely candidates for announcement as Presidential initiatives but are still under consideration.

Initiative B1: Restore some direct Federal funding for energy-efficiency projects.

Short Title: Restore Some Direct Federal Funding for Energy-Efficiency Projects

Description: Until recently, the largest energy-using agencies (DOD, GSA, and DOE) received direct appropriations to fund energy-efficiency improvements at their own facilities, and DOE also received appropriations for a small fund to provide grants to smaller agencies that did not have a line-item for efficiency improvements. In FY95, the funding for these three agencies' efficiency programs totaled \$370 million (\$271m at DOD, \$46m at GSA, and \$7m for the FEMP Fund). In FY97 it is virtually zero, except for funding for a small office in DOD. This proposal would restore \$150-200 million (\$100-145m for DOD, \$35-40m for GSA, and \$15m for the FEMP Fund.)

Potential Benefits: Not all efficiency improvements can or should be financed by ESPCs. In fact, the return to the government is larger if we fund some of the projects directly. In addition, the presence of some direct funding will leverage the ESPC possibilities and will raise the visibility and influence of efficiency programs within all agencies.

Affected and Lead Agencies: OMB the lead on including the funding in agency requests; affected agencies are DOD, GSA, and DOE.

Potential Problems and Costs: Cost: \$150-200 million. Congress has cut such direct funding before -- it will require high-level support as a real priority to get such funding restored in the future.

Initiative B2: Create a “Cool Roofs” initiative for smaller government offices and residential facilities. (EPA).

Could be considered as included in Initiative 4 on the A List -- Sustainable development.

Initiative B3: Improve coordination across many programs and agencies that have a significant impact on Federal energy expenditures. (DOE)

Short Title: Improve coordination across many programs and agencies that have a significant impact on Federal expenditures for energy; Weatherization, LIHEAP, Housing subsidy payment, Bureau of Indian Affairs.

Brief Description: Currently several different Federal agencies pay costs of energy in a variety of different programs. These expenditures include itemized energy cost payments as well as non-itemized payments in the form of housing allowances, rent subsidies, and other expenses. In the aggregate, the amount the Federal government is spending on energy is far in excess of the \$8 billion per year that is tracked as direct energy spending by the agencies. The only authority that FEMP has to address energy expenditures is for the Government owned or leased buildings. Agencies that are responsible for the various indirect payments do not generally apply the same directed energy management strategies that have recently been successful in Federal facilities to the non-Federally owned buildings despite the fact that the Federal government spending is affected by energy consumption in those buildings.

This program would expand the use of Federal government contracts to help bring energy savings to the Federal subsidized facilities. A combination of transferring lessons learned and application of private financing would be used to lower the indirect payments to the facilities in accordance with the energy cost reductions delivered.

Potential Benefits: This has the potential of lowering Federal payment requirements across several agencies while providing a similar or better quality of life for the poor who are most affected by energy use and the fluctuations in energy use.

Affected & Lead Agencies: DOE, HUD, BIA, HHS

Potential Problems and Costs: The diversity of the Federal subsidy programs will make the coordination activities daunting, but the most important for subsidized housing can easily be identified. New contracts will need to be negotiated that will allow the Federal agencies to recover the savings based on savings delivered to the subsidized facilities. Legislation will be required.

Initiative B4: Increased use of combined heat and power at Federal facilities (EPA).

Initiative B5: Support the use of State Grant funds to facilitate use of ESPCs and utility financing by State governments. (DOE)

Short Title: Support the use of State Grant funding programs to increase use of ESPC and utility financing wherever possible.

Brief Description: Currently State grant funding for energy management is dependent on appropriations and many State energy offices are completely dependant on this source of funding for the bulk of their activities. The alternative approach is to follow the model proposed and implemented by FEMP for using funds generated from the savings that FEMP helps implement to pay back the cost of the initial FEMP investment. This requires a high leveraging of funding with private sector energy management funds from such sources as Energy Service Companies, utilities, or bond funding placed by the states. The State Energy Offices would then become the center for managing these highly leveraged funding sources and could rapidly expand the use of energy efficiency and renewable energy in state and local facilities. This will speed the reduction of fossil fuel use well beyond the reduction that would be possible if only the annual Federal appropriations were used.

Potential Benefits: Rapidly increases the rate at which state and local governments capture the necessary funds to implement energy saving projects. Some States have begun to implement these types of programs with DOE funding.

Affected & Lead Agencies: DOE State programs and Federal Energy Management Program

Potential Problems and Costs: Most states will need both education on benefits of this approach and the mechanics of the self-financing process from those that have already implemented it, FEMP and some State Energy Offices. State legislatures may need education on changes to legislation.

Initiative B6: Create a FEMP "SWAT" team that would provide consulting on energy waste and would be paid from a fraction of the savings they deliver to the client agencies. (DOE)

Short Title: Create an energy 'SWAT' team to attack energy waste and to be paid from a fraction of the savings they deliver to the agency. Growth of the organization would only be in accordance with their performance in saving energy and dollars. (See FEMP 98 budget)

- * Brief Description: Currently agencies have small energy management staffs that are generally assigned to specific regions of their departments. This proposal would create a self funded team that would be charged with providing assistance to any and all Federal agencies on a fee for service basis with the fee being paid when the agencies start to reap the savings from the project. The only thing that this organization could spend the savings on would be to generate additional savings.

Potential Benefits: This would alleviate the constant problem of insufficient up front funding to spend on 'non-mission' priorities such as energy. The use of private financing for the projects would eliminate the need for appropriations and would speed the generation of energy savings in Federal operations.

Affected & Lead Agencies: DOE (in process), DOD (Army possible)

Potential Problems and Costs: Legislation is required in some cases but most agencies have the authority to proceed with this approach but merely need to behave more entrepreneurially than in the past.

Initiative B7: Support an Energy Bank bill to provide a revolving fund for energy-efficiency investments in Federal facilities. (DOE)

Short Title: Support the Energy Bank Bill to provide a revolving fund for energy efficiency in Federal facilities

Brief Description: The Energy Bank Bill would create a revolving fund for energy management funding.

Potential Benefits: The bill will not solve all funding problems but will provide at least a base level of funding that would not be as easily subject to the annual appropriations shortfalls and competing budget requirements. Stable funding would ensure both continuing energy saving projects and help to maintain the human infrastructure that is essential to completing both appropriated and privately financed projects.

Affected & Lead Agencies: All agencies. DOE has been proposed as the lead agency for managing the fund.

Potential Problems and Costs: The current version proposes to have agencies provide a percentage of their energy expenditures to seed the fund. Agencies are reluctant to provide the funds under those conditions. Other suggestions propose an energy bond issue or similar Treasury borrowing process to capitalize the fund.

Initiative B8: Allow sale of electricity from any Federal facility that can support a cogeneration load. (DOE)

Short Title: Allow sale of electricity from any Federal facility that can support a cogen load.

Brief Description: Several Federal facilities have large thermal loads for building heating or process activities. This energy need is often met by simply burning fossil fuels to generate heat. The sites often do not generate electricity from the fossil fuel use because they are not allowed to sell the excess electricity off of the Federal facility into the marketplace.

A more efficient way to generate this heat would be to use the fossil fuel to generate electricity and use the waste heat from the process to supply the thermal load. This cogeneration process requires less fossil fuel use to provide the same amount of useful energy.

Potential Benefits: Lower costs of operation could be achieved by allowing the electricity sold on the market to be a credit toward the facilities fuel bill. Lower energy use would result from comparable thermal loads and lower environmental emissions would result from the same quantity of energy used.

Affected & Lead Agencies: DOE, DOD, Coast Guard, VA, GSA, others

Potential Problems and Costs: This will require a change in legislation to allow excess cogenerated electricity to be sold into the marketplace consistent with the demands of the existing thermal load at the Federal site.

Initiative B9: Guarantee procurement of specific energy-efficient equipment as an incentive to begin manufacturing

Short Title: Support bulk procurement of energy efficient equipment to draw innovative efficient equipment into the market (e.g. DLA a-lamp purchase)

Brief Description: There are many products which can be built and sold in large quantity but have been delayed in their entry into the marketplace by lack of an existing market. In recent years, the Defense Logistics Agency proposed to guarantee the procurement of an energy efficient light bulb (the A-lamp) which would cost more initially but would save money over its operating life. DLA was prepared to guarantee a certain purchase level to begin large-scale production at a worthwhile price.

This approach would identify those energy saving technologies which could be widely deployed in the market place but have failed to reach cost effective production merely because the market development was holding back the cost cutting from lost economies of scale. Several technologies would be reviewed and the best would be selected for the start of a demand pull purchasing strategy. The combined buying power of the Federal sector would be leveraged by additional ordering from state and other large institutional buyers. The subsidizing of non-cost effective products across the program is not envisioned, although subsidies in early years with guaranteed additional saving to balance the subsidy in later years is an option.

Potential Benefits: Speeds the introduction of additional energy efficient products into the market while cutting Federal costs.

Affected & Lead Agencies: DOE, GSA possible, DOD/DLA possible

Potential Problems and Costs: This process requires a commitment to buy products that will involve a large aggregation of demand across several Federal and non-Federal organizations.

Initiative B10: Allow ESPCs to be used for mobility energy (i.e. ships, planes, trucks). (DOD)

Short Title: Allow ESPC to be used for mobility energy (ships, planes, trucks, etc.)

Brief Description: Building energy is only about 1/2 of the total energy cost within the Federal sector. Mobility energy is roughly equal in cost to building energy use. Techniques to improve the efficiency of mobility energy use are limited compared to building energy efficiency methods. For example, ESPC authority only extends to building energy reductions. The extension of this authority to reduce energy use in mobile equipment would greatly expand the amount of energy and cost savings that could be delivered to the taxpayers. The initiative can be constructed to either apply only to "hotel loads" on mobile platforms (HVAC, lighting, laundry, etc.) or it could be applied to all energy use on the platform, including primary propulsion.

Potential Benefits: While energy and cost savings would accrue, the ability to improve mission performance of many mobile equipment is by far the greatest benefit. These improvements accrue largely to DOD and enhance the war fighting capability of the services with improvement in range, payload, capacity, endurance, and addition of redundant systems.

Affected & Lead Agencies: DOE, DOD, Transportation (USCG&FAA), NASA

Potential Problems and Costs: In some mobile equipment, tracking energy savings would be difficult if the savings were simply shifted to additional steaming hours or flying hours. There is no cost benefit provided by current accounting practices for the improved readiness this might provide. Legislative change would be required.

Initiative B11: "Green Power" Purchase Requirement

Short Title: Electricity Purchase Portfolio Standard

Brief Description: Encourage the use of electricity generating sources that are beneficial to climate change in any electricity purchase for a Federal facility. As a minimum the amount of renewable energy that is purchased through any electricity purchase contract should be in the same proportion as that specified by the State Public Utility Commission as a proportion of all electric power produced by renewable sources. Individual facilities should procure, as their first option for supply, additional percentages of electricity from renewable sources where it is the most economical energy source over the life cycle of the facility. In coordination with the purchase of renewable energy supplies, agencies and facilities should incorporate efficiency savings mechanisms in the portfolio of options and allow the use of cost savings from efficiency services to further reduce energy load on the system and thereby reduce the expense of the renewable energy system purchased.

Potential Benefits: No increased cost to the Government for delivered fossil energy reductions and expanded renewable energy delivery. Government minimum renewable energy use will be driven by state mandates for their portfolio mix of energy sources.

Affected & Lead Agencies: All agencies will see fossil energy use decline. GSA and DOD are the principle contracting organizations.

Potential Problems and Costs: Has the potential to set possible cost savings aside from efficiency measures to be used in whole, or in part, to cover possible increases in electricity costs. However, adherence to Federal life-cycle costing standards would minimize any potential to increase cost of power delivered above the minimum required by State portfolio standards.

TJ's
paper

Federal Energy Usage Options

Here is a list of the ideas that have been proposed for decision. Those with a check in front of them have been written up in "one-pager" format and are attached.

- Promote the use of ESPCs and disseminate guidelines for scoring.
- ✓ Best practices guide on buying for the environment (FEMP/OFPP).
- ✓ OMB-led inter-agency implementation group, including the Federal Environmental Executive.
- ✓ Raise the visibility/placement of the Federal Environmental Executive -- move to CEQ -- and expand the FEE's role to include energy efficiency.
- ✓ Government-wide review of management directives to eliminate biases that inhibit purchase of energy-efficient products and services.
- ✓ Expand government-wide training on energy efficiency -- encourage use of FEMP classes, and publicize private training offerings as well.
- ✓ Edit, update, and consolidate Executive Orders on energy and the environment to the maximum extent practical. (I think the last energy efficiency E.O. replaced the previous versions, so there's not much room for consolidation.)
- ✓ Sponsor another "Buy Environmental" trade fair similar to the one held for recycled products in 1992.
- ✓ Use alternative contracting vehicles to acquire energy efficient and environmentally-preferable products.
- ✓ Develop training and incentives for program and contracting personnel to acquire energy-efficient and environmentally-preferable products.
- Sustainable design and "Cool Communities" programs for military bases (DOD).
- Promote use of geothermal heat pumps on military bases (DOD).
- ✓ PNGV-like program for medium and heavy diesels, managed by DOD/TACOM (Tank and Automotive Command) (DOD).
- ✓ Refocus Alternative-Fuel Vehicle (AFV) program to focus on fuel types that reduce greenhouse gas emissions on on high-mileage vehicle classes.

Federal Energy Usage Options

Make improved procurement practices consistent with or focused on the Energy Star standards program (EPA).

Increased use of combined heat and power at Federal facilities (EPA).

Create a "Cool Roofs" initiative (a subset of Cool Communities type activities) for smaller government offices and residential facilities. (Big office buildings don't have a large enough (roof area)/(building volume) ratio for this to make much difference) (EPA).

- ✓ Improve coordination across many programs and agencies that have a significant impact on Federal energy expenditures: Weatherization, LIHEAP, housing subsidy program, Bureau of Indian Affairs. (DOE)
- ✓ Allow ESPCs to be used for all facilities where Federal funds pay the energy bills even indirectly (i.e. public housing). (DOE)
- ✓ Allow ESPCs to be used for mobility energy (i.e. ships, planes, trucks). There are two interpretations for this. A tight definition just expands ESPC use to ships for "hotel load" energy use -- HVAC, laundry, lighting, etc. A broad definition would allow ESPC financing for retrofitted/new trucks and propulsion energy on ships and planes. (DOE)
- ✓ Create a FEMP "SWAT" team that would provide consulting on energy waste and would be paid from a fraction of the savings they deliver to the client agencies. (DOE)
- ✓ Support an Energy Bank bill to provide a revolving fund for energy-efficiency investments in Federal facilities. (DOE)
- ✓ Allow sale of electricity from any Federal facility that can support a cogeneration load. (DOE)
- ✓ Support bulk (guaranteed) procurement of energy-efficient equipment to provide an incentive for manufacturers to begin production of advanced products. (DOE)
- ✓ Specify purchase of products in the top 25 percent of class for energy efficiency whenever possible. (DOE)
- ✓ Support the use of State Grant funds to facilitate use of ESPCs and utility financing by State governments wherever possible. (The States can use the grant money for this purpose already, so there's not much new here.) (DOE)
- ✓ Restore some direct Federal funding for energy-efficiency projects (\$150-200 million).

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

- 1. Short Title:** Best Practices Guide on Buying for the Environment
- 2. Brief Description (1 or 2 sentences):** This document would address successful initiatives taken throughout the Federal Government to increase purchases of energy efficient and environmentally preferable products and services; and serve as a resource guide for agencies to use in establishing their own programs for conserving energy, meeting Executive Orders' goals, learning of new product availability, and purchasing efficient quality products and services at the lowest cost and with the highest return of savings.
- 3. Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** Negligible, although some dollar savings can be expected from agencies not having to 'reinvent the wheel' for each of its new programs. This document could also produce savings if produced electronically and tied to the ARNET, FEMP and FEE homepages.
- 4. Affected and Lead Agencies:** All agencies could benefit from such a document that has been long in coming. FEMP/OFPP and/or the Federal Environmental Executive (FEE) should take the lead in establishing an interagency working group, with involvement from GSA, DOD and other relevant agencies to have a working draft ready for review by mid-October and a final edition published by December.
- 5. Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** Short Time Frame - developing the document would have to become a priority initiative for both FEMP and the Office of the FEE in order to have it completed by December; Widest Distribution - in order to reach the largest audience, both paper and electronic versions should be developed, and hyperlinks should be established to the Environmental, Energy, Building Management and Procurement Websites; and Contributors - All agencies on the working group would have to contribute to the writing and development of the guide.

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

- 1. Short Title:** OMB-led Interagency Implementation Group
- 2. Brief Description (1 or 2 sentences):** Reestablish an interagency high level group of environmental/energy program and procurement officials under joint leadership of the OMB PAD and OFPP and/or the Federal Environmental Executive (FEE) to share ideas and spread successful program efforts more rapidly throughout other agencies. In the past, a similar type of group met quarterly to address policy issues and assign specific initiatives for agency implementation.
- 3. Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** Savings would be nominal monetary savings from program and administrative efficiencies. There would be faster generation and wide spread implementation of energy conservation, pollution prevention and environmentally preferable products initiatives.
- 4. Affected and Lead Agencies:** Although OMB would lead efforts, all major procuring agencies and those with a significant share of Federal facilities, environmental contracting, or energy consumption would also have to be major players.
- 5. Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** OFPP considers this to be a "special interest" outside of major acquisition reform priorities and may not want to play a leadership role. Presently, the FEE does not have authority over agencies' energy conservation initiatives and may not want to be in a leadership role unless the group addresses significant recycling and environmentally preferable initiatives. (The group thought this would be helpful in eliminating the cost of project development in advance of attaining policy support for new initiatives.)

CAV- program2

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

- 1. Short Title:** Improve the placement (house at CEQ) and expand the role of the Federal Environmental Executive (FEE) to include: coordination, implementation, consolidation, measurement, and reporting on federal environmental and energy programs.
- 2. Brief Description (1 or 2 sentences):** The Office of the FEE is housed at EPA, but technically it reports directly to the White House Council on Environmental Quality, and not through the EPA. Placement of this Office within an agency instead of within the EOP has diluted its authority and abilities to effect change. Currently, the FEE has responsibility for 'environmental' issues; EPA handles environmental and pollution prevention issues but coordinates with the FEE; while energy conservation has been kept separate and is handled by FEMP. This has been an ineffective strategy, as many of the same barriers and problems addressed on the environmental side are just beginning to be aired by the Energy folks. These two areas should be meshed and initiatives should be coordinated through one office or focal point. In many cases, agencies have assigned responsibility for all these areas to its senior level Agency Environmental Executives (AEEs) who coordinate with but do not report to the FEE on environmental initiatives but do not coordinate with the FEE on energy initiatives. The AEEs are primarily responsible for compliance and reporting; more authority and responsibility would have to be placed upon the AEEs.
- 3. Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** White House level placement of the FEE should provide more visibility and demonstrate the importance of these initiatives within the Administration. A reduction in redundancy and inefficiencies should yield some administrative costs; and more effective use of resources for priority initiatives is also a potential benefit (the FEE has a staff of 3-5 details; EPA Environmentally Preferable has 5 FTE; Pollution Prevention has 68 FTE; FEMP has 22 FTE).
- 4. Affected and Lead Agencies:** CEQ, DOE, EPA, and the Office of the FEE
- 5. Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** Most likely, DOE will want to retain its autonomy and authority for Government-wide energy initiatives. In past discussions, the OMB General Counsel was resistant to placing the FEE within the EOP. The FEE is paid by EPA and the office is staffed with detailees from DOD, EPA, GSA and other agencies on a rotating basis. (The FEE must recruit its own staff and has not always been successful.

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

- 1. Short Title:** Government-wide Review of Management Directives
- 2. Brief Description (1 or 2 sentences):** As OMB did with its Circulars, agencies should be directed and encouraged to undergo a major review of all internal management directives to eliminate any biases inhibiting energy conservation or the purchase of energy efficient and environmentally preferable products and services, and ensure the consideration of life cycle costs and energy efficient and environmentally preferable factors in its management policies and decisions.
- 3. Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** Proactive rather than reactive elimination of costly and time consuming barriers
- 4. Affected and Lead Agencies:** All
- 5. Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** For some agencies, such as DOD, this could become a labor intensive task with minimal changes that would effect results. DOD and GSA may prefer initially to concentrate on building design specifications and facility management directives.

CAV program4

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

1. **Short Title:** Expand Government wide Education and Training on Energy Conservation
2. **Brief Description (1 or 2 sentences):** Currently, there are no singular Federal management training programs available that address or promote the consideration of energy efficiency and conservation or attaining E.O. goals. DOD has an extensive program management course, attended by many Federal managers, which could be tailored to address the issues of energy efficiency and conservation. Other agencies should be encouraged to attend FEMP's new training seminars on ESPC contracting. Lists of any known government training programs or private sector trainers that are credible should be compiled, made available and advertised through FEMP, the FEE, Websites and/or the best practices guide to be developed.
3. **Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** Every person trained to factor in energy conservation concerns and life cycle cost analyses in the conduct of their regular job, be it program management, facility maintenance, or procurement, equates to the generation of more savings and the achievement of our targeted goals.
4. **Affected and Lead Agencies:** All, with leadership and coordination from DOD, DOE (FEMP) and/or the FEE
5. **Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** The Federal Government cannot promote one public or private sector training vendor over another, therefore notices would have to go out to compile lists. Most agency training budgets are scarce and energy efficiency training will probably not be a priority unless it is subsumed into other kinds of training courses, i.e., program management.

CAV - program5

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

1. **Short Title:** Edit, update and consolidate Executive Orders on Energy and Environment to the maximum extent practicable.
2. **Brief Description (1 or 2 sentences):** Currently there are 7 Executive Orders issued by this Administration to address environmental and energy issues at a detailed and micromanagement level. To have continued impact, sustained life, and greater visibility, as well as to produce substantiated reported results, they should be consolidated as much as possible and reference a single focal point (CEQ and/or the FEE) for coordination, oversight and maximum effectiveness.
3. **Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** Greater efficiency; single point of contact for implementation assistance; and consolidation of resources.
4. **Affected and Lead Agencies:** GSA, DOE, EPA, FEE, CEQ, DOD and any other agency with current responsibilities under existing Executive Orders.
5. **Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** Agencies with current responsibilities and authorities may be reluctant to give them up. There may be an inability to reach consensus as to where the single focal point should be.

CAV - program6

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

1. **Short Title:** Sponsorship of another Federal "Buy Environmental" Trade Fair, similar to the one held for recycled products in 1992.
2. **Brief Description (1 or 2 sentences):** The 1992 Trade Fair, which included a major educational component for Federal program, facility, and procurement managers, was successful in providing Federal employees the opportunity to learn more about technological advances and capabilities, existing agency programs, and new products. It was the first and only time such an event was specifically geared to the Federal audience and was very well attended by both Government personnel and private sector vendors.
3. **Potential Benefits (Identify energy savings as small, medium or large, carbon savings or dollar savings if known):** It would provide a venue for new and often small and emerging energy service contractors to learn how to sell to the Federal Government and would provide an opportunity for agencies to meet members of the competitive energy service market, increasing future competition and potentially lowering costs for these services.
4. **Affected and Lead Agencies:** It would have to be a multi-agency effort with high level (OMB or White House) support.
5. **Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g. budget ceilings, if known):** For the 'Buy Recycled' Trade Fair, a dozen or so large agencies were solicited for monetary contributions to pay for the event. Funding, although it came, was late and impeded effective management and top level participation, i.e., commitments could not be made with well-known speakers who required fees.

CAV - promotion1

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

1. **Short Title:** Increase the use of alternative contracting vehicles for acquiring energy efficient and environmentally preferable (EEEP) products and services.
2. **Brief Description (1 or 2 sentences):** Establishing, and modifying, three alternative contracting vehicles could increase the government's purchases of EEEP products and services - - by making it easier and less costly for employees in any government agency to purchase such products and services from those vehicles. One of the three would need to be established, i.e, an indefinite delivery/indefinite quantity, multiple award, contract (MAC) drafted to acquire EEEP products and services exclusively. The other two: GSA's Multiple Award Schedules (MAS); and GSA's On-line Electronic Catalog System (GSA Advantage), would need to be modified to conspicuously remind agency personnel of the government's preference for ordering EEEP products and services.
3. **Potential Benefits (Identify energy savings as small, medium, or large, carbon savings or dollar savings if known):** Unknown.
4. **Affected and Lead Agencies:** All agencies could benefit from reduced time and administrative costs of identifying and purchasing EEEP products and services. GSA would have to modify at least two of the three contracting vehicles. An executive agency would have to agree to establish the MAC. DOD, EPA, and DOE could provide valuable assistance.
5. **Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g., budget ceilings, if known):** (1) While some guidance is available, uniform standards and mechanisms for unambiguously identifying and designating environmentally preferable products and services do not exist at this time. Some agencies, with assistance from EPA, are participating in pilot programs that may lead to developing designations of environmentally preferable products. (2) If these contracting vehicles are used as a direct alternative to ESPC contracting (to gain substantial energy savings engineering and financing of such without sufficient appropriated funding), there are possible problems in that certain requirements of the Energy Policy Act (e.g., guaranteed savings) would not necessarily be part of these alternative contracting vehicles. Even if some savings were negotiated, they would probably not be as great as the savings guarantees that could be achieved by using the energy savings performance contracts (ESPCs) authorized by the Energy Policy Act.

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

1. **Short Title:** Develop appropriate training and consider providing monetary and non-monetary incentives to program and contracting personnel for acquiring energy efficient and environmentally preferable (EEEP) products and services. Incentives could be based on first determining why personnel are not buying EEEP products and services, i.e. both institutional and behavioral reasons. These incentives could then be used to overcome barriers
2. **Brief Description (1 or 2 sentences):** Increased acquisition of EEEP products could result from developing appropriate training and providing monetary and non-monetary incentives (e.g., awards) for program and contracting personnel to acquire such products and services. GSA's Federal Acquisition Institute (FAI) and the Defense Acquisition University (DAU) could be tasked with developing and conducting courses on acquiring EEEP products and services or tasked to build EEEP into their existing training. Private sector training providers could also be encouraged to develop similar training.
3. **Potential Benefits (Identify energy savings as small, medium, or large, carbon savings or dollar savings if known):** Unknown.
4. **Affected and Lead Agencies:** GSA, DOD, EPA's Office of Pollution Prevention and Toxic Substances, OFEE, and DOE (FEMP).
5. **Potential Problems & Costs (Briefly identify any known barriers, impediments to implementation or other problems, e.g., budget ceilings, if known):** Training: (1) FAI will probably need additional funding to develop and conduct these courses. (2) Some would argue that commercial-type services like training should be developed by the private sector and that FAI and DAU should not be encouraged to compete with the private sector by developing new courses. Incentives: (1) Any monetary incentives would need to come from existing agency funding for monetary incentives which is presumably slim. (2) Contracting personnel are faced with a myriad of laws and regulations that they must implement, some of which appear to conflict with each other. To provide monetary awards for contracting with sources that are energy efficient or environmentally preferable could skew the source selection process over other, possibly competing, objectives. For example, some may be motivated to purchase EEEP products and services where the purchase would not pass a best value analysis.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Allow ESPC/FREE Savings to be used for all facilities where Federal money supports the energy bills even indirectly (i.e. public housing rent subsidy payments)

Brief Description Current Federal mandates for agencies requires only that they save energy in Federally owned and leased facilities. Agencies have begun to adapt to the lack of appropriations and substituted ESPC to capture the existing energy savings in those Federal building. There are several Federally subsidized buildings where the owners have been encouraged to enter into ESP contracts as a mechanism of cutting energy use and lowering the subsidy required. IN general this has met with limited success in part because the facilities have limited expertise in the contracting process. However, the use of Federal ESPC expertise and contracts in federally subsidized could rapidly expand the energy and cost savings in those buildings.

Potential Benefits Increase cost and energy savings could accrue to the taxpayers and better living conditions could be provided to the citizens of subsidized facilities.

Affected & Lead Agencies DOE, HUD, HHS, SSA, BIA

Potential Problems and Costs More complex business environment would drain existing senior resources from other Federal priorities for a short time.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Allow ESPC to be used for mobility energy (ships, planes, trucks)

Brief Description Building energy is only about 1/2 of the total energy use within the Federal sector. ESPC authority only extends to building energy reductions. The extension of this authority to reduce energy use in mobile equipment would greatly expand the amount of energy and cost savings that could be delivered to the taxpayers.

Potential Benefits While energy and cost savings would accrue, the ability to improve mission performance of many mobile equipments is by far the greatest benefit. These increases accrue largely to DOD and enhance the war fighting capability of the service with improvement in range, payload, capacity, endurance and addition of redundant systems.

Affected & Lead Agencies DOE, DOD, Transportation (USCG&FAA), NASA

Potential Problems and Costs In some mobile tracking energy savings would be difficult if the savings were simply shifted to additional steaming hours or flying hours. There is no cost benefit provided by current accounting practices for the improved readiness this might provide.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Create an energy 'SWAT' team to attack energy waste and to be paid from a fraction of the savings they deliver to the agency. Growth of the organization would only be in accordance with their performance in saving energy and dollars. (See FEMP 98 budget)

Brief Description Currently agencies have small energy management staffs that are generally assigned to specific regions of departments. This proposal would create a self funded team that would be charged with providing assistance to any and all Federal agencies on a fee for service basis with the fee being paid when the agencies starts to reap the savings form the project. The only this the organization could spend the savings on would be to generate additional savings.

Potential Benefits This would alleviate the constat problem of insufficient up front funding to spend on 'non-mission' priorities such as energy. The use of private financing for the projects would eliminate the need for appropriations and would speed the generation of energy savings in Federal operations.

Affected & Lead Agencies DOE (in process), DOD (Army possible)

Potential Problems and Costs Legislation is required in some cases but most agencies have the authority to proceed with this approach but merely need to behave more entrepreneurially than in the past.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Support the Energy Bank Bill to provide a revolving fund for energy efficiency in Federal facilities

Brief Description The Energy Bank Bill would create a revolving fund for energy management funding.

Potential Benefits The bill will not solve all funding problems but will provide at least a base level of funding that would not be as easily subject to the annual appropriations shortfalls and competing budget requirements. Stable funding would ensure both continuing energy saving projects and help to maintain the human infrastructure that is essential to completing both appropriated and privately financed projects.

Affected & Lead Agencies All agencies. DOE has been proposed as the lead agency for managing the fund.

Potential Problems and Costs The current version proposes to have agencies provide a percentage of their energy expenditures to seed the fund. Agencies are reluctant to provide the funds under those conditions. Other suggestions have proposed a energy bond issue of similar Treasury borrowing process to capitalize the fund.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Allow sale of electricity from any Federal facility that can support a cogen load.

Brief Description Several Federal facilities have large thermal loads for building heating or process activities. This energy need is often met by simply burning fossil fuels to generate heat. The sites often do not generate electricity from the fossil fuel use because they are not allowed to sell the excess electricity off of the Federal facility into the marketplace.

A more efficient way to generate this heat would be to use the fossil fuel to generate electricity and use the waste heat from the process to supply the thermal load. This cogeneration process requires less fossil fuel use to provide the same amount of useful energy.

Potential Benefits Lower costs of operation could be achieved by allowing the electricity sold on the market to be a credit toward the facilities fuel bill. Lower energy use would result for comparable thermal loads and lower environmental emissions would result from the same quantity of energy used.

Affected & Lead Agencies DOE, DOD, Coast Guard, VA, GSA, others

Potential Problems and Costs This will require a change in legislation to allow excess cogenerated electricity to be sold into the marketplace consistent with the demands of the existing thermal load at the Federal site.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Support bulk procurement of energy efficient equipment to draw innovative efficient equipment into the market (DLA a-lamp purchase)

Brief Description There are many products which can be built and sold in large quantity but have been delayed in their entry into the marketplace by lack of an existing market. IN recent years, the Defense Logistics agency proposed to guarantee the procurement and an energy efficient light bulb (the A-lamp) which would cost more initially but would save money over its operating life. DLA was prepared to guarantee a certain purchase level to begin large scale production at a worthwhile price.

This approach would identify those energy saving technologies which could be widely deployed in the market place but have failed to reach cost effective production merely because the market development was holding back the cost cutting from lost economies of scale. Several technologies would be reviewed and the best proposed for the start of a demand pull purchasing strategy. The combined buying power of the Federal sector would be leveraged by additional ordering from state and other large institutional buyers. The subsidizing of non cost effective products across the program is not envisioned although subsidies in early years with guaranteed additional saving to balance the subsidy in later years is an option

Potential Benefits Speeds the introduction of additional energy efficient product into the market while cutting Federal costs.

Affected & Lead Agencies DOE, GSA possible, DOD/DLA possible

Potential Problems and Costs This process requires a commitment to buy products that will involve a large aggregation of demand.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Support bulk procurement of energy efficient equipment to eliminate inefficient buying (i.e. buy items in the top 25% of class for energy efficiency)

Brief Description The Federal Government is the largest purchasing organization in the nation. It spends several billion annually on products and equipment that are bought by a diverse set of individuals across all agencies. Many of these product and equipments consume energy as part of their normal function. These include office equipment, heating and cooling equipment, lights and motors for all types of operation.

A program to expand the education and product and catalogue markings to show the most energy efficient products and to allow the purchasing agents to buy these products without having to research the efficiency of the different products.

Potential Benefits This program will convert a portion of the money that is in each agencies appropriations that is currently spent without regard to energy, into an pool that will save energy while in no way diminishing the effect on the agencies mission.

Affected & Lead Agencies DOE, GSA, DOD/Defense Logistics Agency

Potential Problems and Costs While most of the energy saving product can be bought for little or no increase in cost, in order to get the full benefit from this program there will be a need to allow purchasing agents to pay an increase in price for any product which can save more than it costs over its life to operate.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Support the use of State Grant funding programs to increase use of ESPC and utility financing wherever possible.

Brief Description Currently State grant funding for energy management is dependent on appropriations and many State energy offices are completely dependant on this source of funding for the bulk of their activities. The alternative approach is to follow the model proposed and implemented by FEMP for using funds generated from the savings that FEMP helps implement to pay back the cost of the initial FEMP investment. This requires a high leveraging of funding with private sector energy management funds from such sources as Energy Service Companies, utilities, or bond funding placed by the states. The State Energy Offices would then become the center for managing these highly leveraged funding sources and could rapidly expand the use of energy efficiency and renewable energy in state and local facilities. This will speed the reduction of fossil fuel use well beyond the reduction that would be possible if only the annual Federal appropriations were used.

Potential Benefits Rapidly increases the rate at which state and local governments capture the necessary funds to implement energy saving projects. Some States have begun to implement these types of programs with DOE funding.

Affected & Lead Agencies DOE State programs and Federal Energy Management program

Potential Problems and Costs Most states will need both education on benefits of this approach and the mechanics of the self financing process from those that have already implemented it, FEMP and some State Energy Offices. State legislatures may need education on changes to legislation.

**Potential Major
Energy Conservation
Initiatives for Federal Facilities & Transportation**

Short Title Improve coordination across many programs and agencies that have a significant impact on Federal expenditures for energy: Weatherization, LIHFAP, Housing subsidy payment, Bureau of Indian Affairs.

Brief Description Currently several different Federal agencies pay costs of energy in a variety of different programs. These expenditures include itemized energy cost payments as well as non-itemized payments in the form of housing allowances, rent subsidies, and other expenses. In the aggregate, the amount the Federal government is spending on energy is far in excess of the \$8 billion per year that is tracked as direct energy spending by the agencies. The only authority that FEMP has to address these expenditures in Government owned or leased buildings. Agencies that are responsible for the various indirect payments do not generally apply the same directed energy management strategies that have recently been successful in Federal facilities to the non-Federal owned buildings despite the fact that the Federal government spending is affected by energy consumption in those buildings.

This program would expand the use of Federal government contracts to help bring energy savings to the Federal subsidized facilities. A combination of transferring lessons learned and application of private financing would be used to lower the indirect payments to the facilities in accordance with the energy cost reductions delivered.

Potential Benefits This has the potential for lowering Federal payment requirements across several agencies while providing a similar or better quality of life for the poor who most effected by energy use and the fluctuations in energy use.

Affected & Lead Agencies DOE, HUD, BIA, HHS

Potential Problems and Costs The diversity of the Federal subsidy programs will make the coordination activities daunting but the most important for subsidized housing can easily be identified. New contracts will need to be negotiated that will allow the Federal agencies to recover the savings based on savings delivered to the subsidized facilities.

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES & TRANSPORTATION**

- 1. Short Title:** Partnership for Next Generation Compression Ignition Engine
- 2. Brief Description:** Establish consortium of medium/heavy diesel engine manufacturers and research organizations, to include commercial, academic and government laboratories, with the expressed purpose of accelerating technology transfer of advanced compression ignition engine technologies from research to manufacturing. The consortium shall function to (1) assure a strong competitive U.S. diesel engine and commercial heavy vehicle industrial base, (2) develop the most environmentally compliant and fuel efficient compression ignition engines that are technologically achievable and (3) integrate unique military engine performance / configuration requirements into commercial designs to ensure a common industrial base.
- 3. Potential Benefits:** Coordination of non-competitive research related to diesel engine technologies will promote resource leveraging and more efficient applications of advanced technologies. Promoting direct interaction of manufacturing elements in advanced research planning and execution will accelerate technology adoption, thereby making fleets more fuel efficient and environmentally compliant in an accelerated time frame, while making research more relevant to customer needs. Government consortium sponsorship will enable greater influence over direction of technology R&D and allow DOD to buy and support future engines with minimal modifications, making both production and logistics considerations more cost effective.
- 4. Affected and Lead Agencies:** Affected Agencies should include Department of Defense, Department of Transportation and Department of Energy. The lead agency should be Department of the Army, U.S. Army Tank-automotive and Armaments Command (TACOM), Tank Automotive Research, Development and Engineering Center (TARDEC), National Automotive Center (NAC).
- 5. Potential Problems & Costs:** Problems include (1) Collaboration and sharing of advanced technologies amongst competitive medium/heavy engine and heavy vehicle manufacturers, (2) Integration of unique military engine requirements (i.e., power density, configurations, etc.) into commercial designs that are driven by market forces and (3) Uncertainties related to future fuel types and standards (e.g., uniformity).

POTENTIAL MAJOR ENERGY CONSERVATION INITIATIVES FOR FEDERAL FACILITIES & TRANSPORTATION

1. **Short Title:** Alternative Fueled Vehicles (AFVs) that Meet Economic, Energy, and Environmental Goals
2. **Brief Description:** Refocus implementation of the Energy Policy Act to: 1.) Use the Partnership for the Next Generation of Vehicles (PNGV) to develop cost effective light-duty vehicles that reduce green house emissions; and, 2.) Purchase currently available AFVs that are cost-effective and reduce greenhouse emissions.

Not all alternative fuels reduce greenhouse gases. The current AFV program creates incentives for federal agencies to purchase light-duty AFVs using alternative fuels that *increase* greenhouse emissions. In addition, lack of adequate refueling infrastructure for many alternative fuels forces agencies to operate bi-fuel vehicles on gasoline in many cases, thus increasing vehicle procurement costs without providing energy security or emissions benefits.

Since AFVs cost a premium to procure, only fuel types that cost less than gasoline have a potential to be cost effective over the life of the vehicle. Gaseous alternative fuels cost less than petroleum-based fuels, including gasoline. For gaseous fuels, the fuel savings for typical light-duty vehicles is usually insufficient to offset the higher cost of the vehicle. Fuel saving for high usage or vehicles with low fuel efficiency are usually sufficient to recoup the higher vehicle cost.

Recommend, refocusing the AFV program to develop cost-effective, more fuel-efficient, light-duty vehicles that will produce lower emissions through the PNGV, and to purchase currently available AFVs operating on gaseous alternative fuels for high usage applications. This will provide greater greenhouse reductions while recouping the increased costs of AFVs through significant fuel savings over the life of the vehicles.

3. **Potential Benefits:** Reduce greenhouse emissions, and the use of petroleum-based fuels. Recoup increased costs of AFVs through fuel cost savings, while maintaining mission capability.
4. **Affected & Lead Agencies:** DOE, DOD, GSA, Postal Service, and all federal agencies with fleets of administrative vehicles. DOC, DOE, DoD, and other federal agencies participating in the PNGV.
5. **Potential Problems and Costs:** Incremental costs of gaseous fueled, AFVs are approximately \$30K per vehicle which must be paid at the time of purchase (incremental purchase cost will be more than offset by life-time fuel operating cost savings). Lack of adequate refueling infrastructure in many parts of the country will require that AFVs be operated on petroleum-based fuels part of the time, thereby reducing the emissions benefits and fuel savings that will be realized.

**ENERGY CONSERVATION
POTENTIAL INITIATIVES
FOR FEDERAL FACILITIES AND TRANSPORTATION**

1. **Short Title:** Restore Some Direct Federal Funding for Energy-Efficiency Projects
2. **Description:** Until recently, the largest energy-using agencies (DOD, GSA, and DOE) received direct appropriations to fund energy-efficiency improvements at their own facilities, and DOE also received appropriations for a small fund to provide grants to smaller agencies that did not have a line-item for efficiency improvements. In FY95, the funding for these three agencies' efficiency programs totaled \$370 million (\$271m at DOD, \$46m at GSA, and \$7m for the FEMP Fund). In FY97 it is virtually zero, except for funding for a small office in DOD. This proposal would restore \$205 million (\$150m for DOD, \$40m for GSA, and \$15m for the FEMP Fund.)
3. **Potential Benefits:** Not all efficiency improvements can or should be financed by ESPCs. In fact, the return to the government is larger if we fund some of the projects directly. In addition, the presence of some direct funding will leverage the ESPC possibilities and will raise the visibility and influence of efficiency programs within all agencies.
4. **Affected and Lead Agencies:** OMB the lead on including the funding in agency requests; affected agencies are DOD, GSA, and DOE.
5. **Potential Problems and Costs:** Cost: \$205 million. Congress has cut such direct funding before — it will require high-level support as a real priority to get such funding restored in the future.