cc: JAF
RL
AM
JA
NJ

THE HISTORIC KYOTO AGREEMENT: A CRITICAL FIRST STEP IN A GLOBAL EFFORT TO ADDRESS GLOBAL WARMING

December 11, 1997

The Kyoto agreement represents an historic and unprecedented step to reduce the threat of global warming in an environmentally strong and economically sound way. It involves 160 nations, and recognizes the crucial importance of specific steps to address climate change. The leadership offered by the President and Vice President allowed this agreement to be completed -- and generations from now, the agreement will be remembered as establishing the core elements of a strong, realistic, and legally binding framework.

- **Target and Timetable:** The United States agreed to a binding target of reducing greenhouse gas emissions to 7 percent below a baseline based on 1990 levels by 2008-2012. The agreement is based on a somewhat different accounting system -- so that the 7 percent reduction is roughly equivalent to the President's initial proposal.

- **Market-Based:** The agreement reflects an historic emphasis on market-based mechanisms to address an environmental problem. In addition to the Clean Development Mechanism, the agreement includes a framework for emissions trading among industrialized countries -- producing the most efficient means of reducing emissions.

- **Coverage of Agreement**: The agreement covers six greenhouse gases, which had been a priority of the United States but had not been included in the proposals from other major economies. The inclusion of all six gases represents a major U.S. victory in the agreement and ensures that the environment will be protected against all major greenhouse gases.

- **Joint Implementation:** The agreement includes a Clean Development Mechanism, that will allow the types of joint implementation projects that will benefit U.S. businesses and allow developing countries to grow in a more energy efficient way. The mechanism gives U.S. companies credit for improving energy efficiency in developing countries.

- **Developing Country Participation:** Global warming is a global problem requiring a global solution. We have therefore adopted a two-step process to this problem. This agreement locks in hard commitments by the developed countries, as well as some commitments by the developing countries (such as on the Clean Development Mechanism). But the President has made very clear that the United States would not take on legally binding targets until there is meaningful participation by developing countries. We will be working hard over the coming months and years to secure that participation.

Global Climate Change: Basic Talking Points
February 1998

Core Message

Global climate change is a key environmental challenge for the 21st century. The world's best scientists tell us that this problem is real and that the threats it poses -- like increasingly frequent and severe storms and droughts and rising sea levels -- are too serious to ignore. It is our responsibility to take vigorous, sensible steps to solve this problem. If we fail to do so, our children and grandchildren will pay the price.

Over the course of the next year, the Clinton Administration will be working hard at home and with our partners abroad to address climate change. Domestically, we will begin implementing the President's plan for reducing greenhouse gas emissions. Internationally, we will build on the historic agreement reached in Kyoto, Japan last December.

President Clinton's Domestic Plan for Reducing Emissions

In October 1997, President Clinton outlined a comprehensive and economically sound plan for reducing U.S. greenhouse gas emissions. This plan emphasizes win-win initiatives designed to cut emissions by increasing energy efficiency; developing new, cleaner energy technologies; working with industry and others to promote sensible solutions; and relying on market-based mechanisms to ensure cost-effective reductions. The plan includes:

- **Tax cuts & research R&D**. The President's plan includes a vigorous program of tax cuts and R&D aimed at cutting greenhouse gas emissions. The package amounts to $6.3 billion over 5 years -- $3.6 billion in tax cuts and $2.7 billion in new investment.

  -- The **tax cut package** includes tax credits for fuel efficient cars of up to $4,000 to consumers who purchase highly efficient vehicles. Also included are credits for rooftop solar electricity and hot water systems, for energy efficient homes and appliances, and for several forms of advanced power generation.

  -- The **investment package** includes research and development spending in the three major carbon-emitting sectors of the economy -- buildings, transportation, and industry. Among projects to be expanded is the Partnership for a New Generation of Vehicles, a government-industry effort to develop super-efficient cars that are attractive, affordable, and meet all applicable safety and environmental standards. Substantial funds will also be invested in research partnerships for key renewable energy technologies.

- **Industry-by-industry partnerships**. A second component of the President's plan includes building partnerships with key energy producing and emitting industries to develop sector-by-sector initiatives to cut emissions. These partnerships will identify opportunities for working together to remove barriers to the development and widespread use of energy efficient technologies and practices.

- **Federal energy use and procurement**. A third element of the President's plan is to substantially reduce the Federal share of U.S. greenhouse gas emissions by improving the energy efficiency of Federal facilities and activities and by overhauling procurement practices. While achieving important reductions and cost savings in their own right, these actions can also set a powerful example for the private sector.

- **Electricity restructuring.** Another core element of the President's plan involves restructuring the electricity industry in such a way as to reduce greenhouse gas emissions while saving consumers millions on their energy bills.

- **Domestic emissions trading**. After a decade of experience in reducing emissions, the President has proposed a domestic emissions trading system beginning in 2008. The goal of such a regime is to ensure that further cuts are achieved as cost-effectively as possible. The U.S. has used emissions trading successfully to reduce the pollution that causes acid rain -- exceeding environmental objectives at costs far lower than anticipated.

The Kyoto Protocol on Climate Change

The Kyoto Protocol is an historic step toward building an effective international response to the problem of climate change. In key respects, the Protocol embraces U.S. proposals -- most notably bringing the power of the free market to bear in protecting the global environment. The essential elements of the Kyoto Protocol include binding emissions targets for industrialized nations and flexible market mechanisms for achieving those targets. Our work over the coming year will focus on achieving meaningful participation from developing countries and on establishing rules and guidelines for putting agreed market mechanisms into practice.

- **Emissions Targets.** The U.S. proposal entering Kyoto was for realistic and achievable emissions targets that were credible in reducing the dangerous buildup of greenhouse gases yet measured enough to safeguard U.S. prosperity at home and competitiveness abroad. We succeeded in achieving this goal by reaching agreement on:

  -- The President's concept of a **multi-year time frame** for emissions reductions rather than a fixed, single-year target. The multi-year time frame will allow nations greater flexibility in meeting their targets.

  -- The President's **specific time frame of 2008-2012**, rather than earlier periods favored by the European Union and others, giving us time to gradually phase in change and deploy new technologies cost-effectively.

  -- **Differentiated targets** for the key industrial powers ranging from 6% to 8% below baseline levels of greenhouse gas emissions, with the U.S. agreeing to a 7% reduction. When changes in accounting rules for certain gases and offsets for activities that absorb carbon dioxide are factored in, the level of effort required by the U.S. is actually quite close to the President's original proposal to return emissions to 1990 levels by 2008-2012. The Kyoto target is at most a 3% real reduction below that proposal.

-- **Coverage of all six greenhouse gases** (the EU and Japan favored counting only three) **and of activities that absorb carbon dioxide**. Including the additional three gases and so called carbon "sinks" provides for more comprehensive environmental protection while also allowing for cost-effective measures to combat climate change.

- **Flexible Market Mechanisms.** Central to making the Kyoto Protocol a comprehensive, global, and cost-effective agreement are several market mechanisms that will provide U.S. companies with real flexibility in how they achieve emissions reductions. These include:

  -- **The U.S. proposal on international emissions trading.** Through our domestic program to reduce acid rain, we have proven that emissions trading is an effective way of achieving environmental objectives at low cost.

  -- **A Clean Development Mechanism** (CDM) establishing the right for U.S. companies to participate with developing countries in specific projects to cut emissions. The CDM encompasses the U.S. proposal on joint implementation and will provide companies with relatively low-cost emissions reduction opportunities overseas while offering developing countries the double benefit of foreign investment and clean technology.

- **Meaningful Participation from Developing Countries.** President Clinton and Vice President Gore have called for the meaningful participation of key developing countries in reducing emissions and will not submit the Kyoto Protocol to the Senate until such participation is achieved. The Kyoto Protocol makes a down payment on meaningful participation (principally through the CDM), and the Administration plans to focus extensive diplomatic efforts over the coming year on securing additional commitments.

- **Economic Implications.** Through our success in achieving realistic and achievable emissions targets (rather than the more extreme proposals of other nations) and in establishing cost-effective market mechanisms (rather than the mandatory, standardized policies and measures favored by others), the U.S. helped craft an agreement that is both environmentally strong and economically sound. Those who claim that addressing global warming will send energy prices soaring and damage the economy ignore key provisions that will dramatically reduce costs, such as international emissions trading, and also ignore the important effects of the President's plan for reducing emissions at home.

Remember: the naysayers have told us for the past 25 years that taking action to protect our environment would hurt the economy and they have been wrong over and over again. Today we have the cleanest environment in a generation and the strongest economy in a generation. Environmental protection and economic growth *have* gone hand in hand and they will in the case of global climate change as well.

The Kyoto Protocol on Climate Change
State Department Fact Sheet
January 15, 1998

BACKGROUND

- At a conference held December 1 - 11 1997, in Kyoto, Japan, the Parties to the UN Framework Convention on Climate Change agreed to an historic Protocol to reduce greenhouse gas emissions by harnessing the forces of the global marketplace to protect the environment.

- The Kyoto Protocol in key respects – including emissions targets and timetables for industrialized nations and market-based measures for meeting those targets – reflects proposals advanced by the United States. The Protocol makes a down payment on the meaningful participation of developing countries, but more needs to be done in this area. Securing meaningful developing country participation remains a core U.S. goal.

EMISSIONS TARGETS

- A central feature of the Kyoto Protocol is a set of binding emissions targets for developed nations. The specific limits vary from country to country, though those for the key industrial powers of the European Union, Japan, and the United States are similar – 8% below 1990 emissions levels for the EU, 7% for the U.S., 6% for Japan.

- The framework for these emissions targets is based largely on U.S. proposals:

  - **Emissions targets are to be reached over a five-year budget period as proposed by the U.S., rather than by a single year**. Allowing emissions to be averaged across a budget period increases flexibility by helping to smooth out short-term fluctuations in economic performance or weather, either of which could spike emissions in a particular year.

  - **The first budget period will be the U.S. proposal of 2008-2012.** The Parties rejected proposals favored by others, including budget periods beginning as early as 2003, that were neither realistic nor achievable. Having a full decade before the start of the binding period will allow more time for U. S. companies to make the transition to greater energy efficiency and/or lower carbon technologies.

  - **The emissions targets include all six major greenhouse gases.** The EU and Japan initially favored counting only three gases – carbon dioxide, methane, and nitrous oxide. Ensuring the inclusion of the additional gases (synthetic substitutes for ozone-depleting CFCs) that are highly potent and long-lasting in the atmosphere provides more comprehensive environmental protection and lends more certainty concerning the treatment of the additional gases.

- Under an emissions trading regime, countries or companies can purchase less expensive emissions permits from countries that have more permits than they need (because they have met their targets with room to spare). Structured effectively, emissions trading can provide a powerful economic incentive to cut emissions while also allowing important flexibility for taking cost-effective actions.

- The Kyoto Protocol enshrines emissions trading. Rules and guidelines – in particular for verification, reporting, and accountability – are to be discussed at the next meeting of the Parties at Buenos Aires in November 1998.

- The inclusion of emissions trading in the Kyoto Protocol reflects an important decision to address climate change through the flexibility of market mechanisms. Led by the United States, the Conference rejected proposals to require all Parties with targets to impose specific mandatory measures, such as energy taxes.

- The United States also reached a conceptual agreement with a number of countries, including Australia, Canada, Japan, New Zealand, Russia and Ukraine, to pursue an umbrella group to trade emissions permits. Such a trading group could further contribute to cost-effective solutions to this problem.

JOINT IMPLEMENTATION AMONG DEVELOPED COUNTRIES

- Countries with emissions targets may get credit towards their targets through project-based emission reductions in other such countries. The private sector may participate in these activities.

- Additional details may be agreed upon by the Parties at future meetings.

CLEAN DEVELOPMENT MECHANISM

- Another important free market component of the Kyoto Protocol is the so-called "Clean Development Mechanism" (CDM). The CDM embraces the U.S. proposal for "joint implementation for credit" in *developing* countries.

- With the Clean Development Mechanism, developed countries will be able to use certified emissions reductions from project activities in developing countries to contribute to their compliance with greenhouse gas reduction targets.

- This Clean Development Mechanism will allow companies in the developed world to enter into cooperative projects to reduce emissions in the developing world – such as the construction of high-tech, environmentally sound power plants – for the benefit of both parties. The companies will be able to reduce emissions at lower costs than they could at home, while developing countries will be able to receive the kind of technology that can allow them to grow more sustainably. The CDM will certify and score projects. The CDM can also allow developing countries to bring projects forward in circumstances where there is no immediate developed country partner.

- Countries may decide, among themselves, how to account for emissions relating to multilateral operations (for example, U.S. training in another NATO country). This provision avoids the need to use emissions trading to allocate such emissions.

COMPLIANCE AND ENFORCEMENT

- The Protocol contains several provisions intended to promote compliance. These include requirements related to measurement of greenhouse gases, reporting, and review of implementation.

- The Protocol also contains certain consequences for failure to meet obligations. For example, as a result of a U.S.-proposed provision, a Party not in compliance with its measurement and reporting requirements cannot receive credit for joint implementation projects.

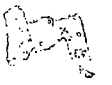
- Effective procedures and a mechanism to determine and address non-compliance are to be decided at a later meeting. For both environmental and competitiveness reasons, the United States will be working on proposals to strengthen the compliance and enforcement regime under the Protocol.

ENTRY INTO FORCE

- The Kyoto Protocol will be open for signature in March 1998. To enter into force, it must be ratified by at least 55 countries, accounting for at least 55 percent of the total 1990 carbon dioxide emissions of developed countries. U.S. ratification will require the advice and consent of the Senate.

APEC

11/3/97



Climate change is a serious threat to the APEC region. We must accelerate action to deal with global emissions of greenhouse gases, starting with a strong agreement next month at the Third Conference of Parties of the Framework Convention on Climate Change, in Kyoto. We affirm the importance of enhancing energy efficiency throughout the region, both to help grow our economies and to address climate change. We also affirm the importance of market-based measures in reducing greenhouse gas emissions. Our nations will explore cooperative approaches for reducing greenhouse gas emissions at low-cost and in ways that promote the development and diffusion of beneficial technologies.

Climate change is a global problem that requires a global solution. Industrialized countries must lead, but both industrialized and developing must participate.

currently - nothing in APEC communique

PRELIMINARY AND INCOMPLETE: CLOSE HOLD
ECONOMIC Q&A
October 20, 1997, 8:30 pm

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. The effects of addressing this critical issue 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 substantially lowers costs by applying the same cost-minimizing principle globally; and

- Joint implementation, whereby US firms would receive credit for undertaking emission reductions in countries with low abatement costs, would also lower the domestic burden.

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?

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

Q: DOESN'T RESEARCH (BY MANNE AND RICHELS) 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 <u>minimal</u> -- 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 <u>without international trading</u>. 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.

<u>CREDIBILITY</u>

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: DO YOU INTEND TO MEET YOUR BINDING OBLIGATION?

A: We certainly intend to meet any binding obligation under the treaty, should the terms of that treaty be adequately negotiated. The issue is a critical one, and the President feels strongly that we must begin to take corrective action. But there are understandably a host of imponderables involved in this undertaking -- which involves actions over a decade or more. So I am also confident that if the costs of action are excessively high, the Congress and the President will make appropriate adjustments.

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 MODELING 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, OMB, 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, and preparation of a new Executive Order to fill any gaps.

- **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.

10/21/97

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: Some models have concluded that permit prices would need to be in that range to reduce emissions to 1990 levels by 2010, but only by ignoring several key aspects of the President's plan:

- First, they ignore international trading. But such trading, along with developing country participation, 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.

- Second, they ignore the President's $5 billion R&D and tax incentive package. Such a program, which was not assumed by the models you cite, has the potential to reduce carbon emissions significantly.

- Third, they ignore the impact of electricity restructuring. The President has indicated his support for a properly crafted electricity restructuring package, which could save consumers billions of dollars and reduce carbon emissions substantially.

- Fourth, they ignore the impact of industry-by-industry consultations to explore market-oriented standards that can encourage energy efficiency.

- Fifth, most models ignore the economic costs associated with climate change itself -- increased flooding, sea-level rise, and other dislocation. They therefore overestimate the *net* economic cost of reducing emissions.

I should also note that there is much uncertainty over cost projections that are a decade or more in the future -- a decade 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 an evaluation period around 2005.

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.

10/21/97

OVERALL CLIMATE CHANGE MESSAGE
October 21, 1997

Climate change is the premier environmental challenge of the 21st century, and the risks it poses justify sensible preventive steps. The President is therefore committed to realistic and binding targets to address this challenge.

His plan is based on **four key principles:**

- **Guided by science.** The vast majority of the world's scientists have concluded that if the countries of world do not work together to cut greenhouse gas emissions, temperatures will rise and disrupt the global climate. Indeed, most scientists say this process has already begun. But there is much we still don't know about how the climate will react to increased greenhouse gas concentrations. That's why the President's plan includes regular 5-year science reviews, to ensure that our policies are guided by the best science available.

- **Market-based.** We have learned that the costs of protecting the environment is substantially lower if we harness the power of markets to do so. That's why the President's plan emphasizes market-based mechanisms, rather than command-and-control. His plan includes a permit trading system for greenhouse gas emissions, similar to the highly successful permit trading system for sulfur dioxide emissions that has operated since 1993.

- **Global participation**. Climate change is a global problem, and requires a global solution. A ton of carbon emitted in Argentina has just as much effect on the global climate as a ton of carbon emitted in the United States -- and by 2035, emissions from developing countries are expected to exceed those from developed countries. The President has committed that the United States will not adopt binding obligations without developing country participation.

- **Common-sense economic reviews.** To reflect the uncertainty involved in addressing climate change, the President has proposed regular 5-year economic reviews, 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.

Start with Win-Win Opportunities at Home + Abroad
Things on the shelf now
Abroad - can do things abroad that grow economies

THE PRESIDENT'S THREE-STAGE APPROACH

Reflecting his four key principles, the President's plan includes three stages:

- **Stage 1: Priming the Pump Through R&D, Tax Incentives, and Industry Consultations (Until 2005).** The first stage of the President's package includes $5 billion in 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 (including market-oriented standards for energy efficiency).

- **Stage 2: Review and Evaluation (2005-2008).** The second stage, which would begin around 2005, is an evaluation period to review our progress and evaluate next steps as we move toward a market-based permit trading system for carbon emissions. During this second stage, the details of the permit system would be refined and perhaps tested. Such a permit system is similar to, at least in concept, the one that currently applies to SO2 emissions -- although the scale would be significantly larger than the current SO2 program.

- **Stage 3: Meeting Binding Targets Through Domestic and International Emissions Trading Program (2008-2012 and beyond).** In the third stage, we would reduce emissions to 1990 levels by 2008-2012, and below 1990 levels after that, through a market-based domestic and international emissions trading system. Before beginning this third stage, the second 5-year economic review would allow Congress and the President to evaluate how the economy had responded to a decade's worth of experience in the first two stages of the President's plan.

This three-stage program recognizes the long-term nature of 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, it allows us 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 without developing country participation and by emphasizing the importance of an international trading system, we take advantage of low-cost reduction possibilities wherever they occur -- either here or abroad.

Q: IS THE TARGET AND TIMETABLE BINDING?

A: Yes. The President believes that his three-stage, graduated program provides a credible way of beginning to address the challenge of climate change.

Q: BUT HOW CAN YOU SAY THE TARGET IS BINDING WHEN SOME CLAIM THE COSTS WILL BE SO HIGH?

A: The other major economies of the world will be committing to the same realistic and binding emissions reductions that we are. If they can make it, then we -- as the world's most competitive economy -- surely can also.

Q: BUT 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, the models to which you refer ignore many factors included in the President's plan -- from international trading to developing country participation, electricity restructuring, and the $5 billion R&D and tax cut package.

- Second, there is much uncertainty over any cost projections that are a decade or more in the future -- a decade ago 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 under $30 billion. Cost estimates have been wrong before -- such as in the sulfur dioxide example -- and they will undoubtedly be wrong again.

- Finally, 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 an evaluation period around 2005. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period with a domestic and international emissions trading system.

Q: IS THE TARGET AND TIMETABLE BINDING?

A: Yes. The President believes that his three-stage, graduated program provides a credible way of beginning to address the challenge of climate change.

Q: BUT HOW CAN YOU SAY THE TARGET IS BINDING WHEN SOME CLAIM THE COSTS WILL BE SO HIGH?

A: The other major economies of the world will be committing to the same realistic and binding emissions reductions that we are. If they can make it, then we -- as the world's most competitive economy -- surely can also.

Q: BUT 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, the models to which you refer ignore many factors included in the President's plan -- from international trading to developing country participation, electricity restructuring, and the $5 billion R&D and tax cut package.

- Second, there is much uncertainty over any cost projections that are a decade or more in the future -- a decade ago 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. Cost estimates have been wrong before -- such as in the sulfur dioxide example -- and they will undoubtedly be wrong again.

- Finally, 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 an evaluation period around 2005. Only after we have accumulated ten years of experience with the first two stages of the program would we enter the internationally binding period with a domestic and international emissions trading system.

Talking Points on Climate Change

The economic consequences of 1990 by 2010:

- I want to begin by saying that I consider global warming an extremely serious issue that requires a meaningful response and significant actions in the near term. You have promised to take real actions to deal with the real threat of climate change. You also promised to pursue a program that is economically realistic--in the sense it doesn't destry the economy, particularly if it's not necessary to achieve the environmental goal.

- You economic team is not opposed to early action. In fact, along with a substantial R&D program, we all agree that it is necessary to increase the price of carbon emissions--either through a carbon tax or through auctioned permits--and then to insure that the price of carbon emissions continues to rise gradually over time if we are ever really to come to grips with this problem. While we recognize that such a revenue generating price increase would be politically difficult we think there are potentially very attractive and popular ways of making such a program revenue neutral.

1990 by 2010:

- Your economic advisers are very concerned about the kinds of targets and timetables that are being discussed--variants of 1990 by 2010. We think it is critical that you understand that this program, or any small variant on it, would be economically devastating to the U.S. economy. It would call for actions that the business community, labor, and families would find completely unacceptable, especially given their ignorance of the issue. We would be talking about the equivalent of a $100-190 billion tax increase, resulting in a 200-300% increase in the price of coal, a $500-$1000 increase in energy expenses for the typical household, and a 20-40 cent gas tax. This is about 9 times the size of the BTU tax.

- You would receive no support from mainstream people who would find such policies irresponsible. You would certainly receive highly critical reviews from the 2600 mainstream economists who signed a letter saying that we should do something about climate change and that there are policies that have benefits exceeding their cost. The economists did not mean 1990 by 2010 or anything like it. In testifying I said that it "if we do this dumb it could cost a lot, but if we do this smart, it could cost very little or even benefit the economy." 1990 by 2010 would be considered dumb, not smart. It would call for actions that business and labor would find completely unacceptable and it would be frankly impossible to defend such a plan against the critiques that would be levelled. While international and environmental expectations would be violated by a failure to adopt at least a 1990 by 2010 target, those expectations are not conditoned on any serious economic analysis of the economic consequences of such a target.

- It does not help significantly to just extend the year of "stabilization" by a decade or so--say 1990 by 2010. The costs of that kind of program are about 90% of the 1990 by 2010

program.

- The U.S. economy is like an ocean liner plowing through the water with a huge amount of momentum. 1990 by 2010 is like asking it to turn on a dime. An ocean liner wants to keep going where it was heading for a while before it is willing to veer off course. Similarly, a sensible program to cut emissions permits emissions to rise for a time--probably a decade or so, before departing susbstantially from BAU. It probably takes another decade or so of level emissions before it is possible to start reducing emissions in absolute terms over time. If the economy is forced to turn on a dime it will be inefficient--needlessly costly--it raises the overall cost of a project by a multiple of 3 to 10 times.

- The attempt to achieve 1990 emission levels by 2010 through reductions in U.S. emissions involves an extraordinarily large cutback in energy use. Carbon emissions are now about 10% above 1990 levels and they will rise another 17% or so by 2010 assuming trend growth of 2.2% and an optimistic assumption concerning the pace of improvement of energy efficiency (1.0%) under constant relative energy prices. This assumes that we continue with business as usual and keep relative energy prices unchanged. So 1990 by 2010 calls for dramatic changes in how we do business: a cutback of about 28% in energy use by 2010 relative to baseline.

    - Cutbacks in energy use (relative to GDP) of this magnitude are greater than those achieved in the decade of the two oil shocks--a period in which aggregate energy prices more than doubled. Between 1972 and 1982 energy use was essentially unchanged in absolute terms while GDP grew in real terms at about 2.25% per year. So we would need to accomplish a larger reduction in energy use than we witnessed over a decade in which energy prices rose 150%. This points to a likely energy price increase of at least comparable magnitude--consistent with a permit price for carbon emissions in the 100 - 200 range.

    - I am simplifying by saying that we have to reduce energy use only--we can also reduce carbon emissions by substituting among fuels--away from more carbon intensive fuels like coal and toward natural gas and renewables. This will help, and it will mitigate the overall energy price impact somewhat. A variety of models suggest that about 30% of the required reduction in emissions could come from changing the fuel mix, but the remaining 70% must still come from increases in end-use efficiency and reduced end-use activity, both of which lower the overall demand for energy.

    - The kind of logic that I just outlined is what is embodied in greater detail in the various models that have been used to assess the impact of the 1990 by 2010 plan. Those models differ a bit about the response of carbon emissions to price changes and technological trends, but a broad range of models place the carbon permit price required to achieve 1990 by 2010, in the absence of an effective international

trading system, in the range of $80 and $140 per ton with a gas price hike between 10 and 25c and a coal price increase between 150 and 350 %. Relative to the BTU tax proposed by the Administration in 1993 this is 4 to 8 times as large. As these numbers suggest, an intervention of very large magnitude in the economy is required with substantial negative economic consequences. The typical family's spending on energy would rise by between $500 and $1000 per year and the impact would be regressive unless revenue is used to reduce other taxes.

- From a macroeconomic perspective, an energy price increase is a supply shock and a shock of this magnitude constitutes a substantial stagflationary shock. It's impact will be to raise inflation, to lower real wages and to raise unemployment, as in the period following the two oil shocks. This isn't a shock because it will be anticipated, but that doesn't mean it won't have significant stagflationary impact. Unemployment in the four years after the first oil shock averaged 7.2% in comparison with 5.0% in the four years prior and unemployment rose further to an average of 8.7% in the four year aftermath of the second. There remains debate about how much of our adverse economic performance was due directly to the oil shock, because there was a simultaneous decline in productivity growth and transfers of real income to OPEC producers. Nevertheless, we should expect that the efforts of the Federal Reserve to contain inflation, coupled with likely efforts on the part of workers to recoup real wage losses will lead to a period of higher unemployment.

- One of the reasons this plan is so costly is because the carbon emission reductions of the magnitude required to meet a 1990 by 2010 target, would necessitate reduced use of coal by electric utilities and, over a time span as short as a decade, this would entail premature obsolescence of a large number of plants. According to almost all analysts reduced use of coal under utility boilers is the largest, cheapest option to reduce carbon emissions in the space of a few decades. Coal plants typically have a useful life of around 50 years. It will be extremely expensive to scrap these plants before the end of their normal lifespan. That's why it generally takes a carbon tax of $100 per ton or so--enough to induce utilities to shut these plants and replace them with new gas-fired plants with high capital costs. However, in 20-40 years they will largely be ready for replacement. (If we had to shut down all 1,122 coal fired plants by 2010, to take an extreme case, we would be replacing 88% of them before the end of their normal lifespan.) In addition, replacing them now means replacing them with currently available technologies rather than the superior technologies that would become available over time.

- Premature scrappage of plant and equipment and the premature replacement of these plants with the technology available now rather than the better technology that will become available later implies that a 1990 by 2010 program is extremely **inefficient.** It entails an unnecessarily costly adjustment for the economy. In fact, this choice of time path is so inefficient in comparison with a path that would permit the same adjustment to be accomplished over a longer time, that the overall cost of achieving a given

environmental goal with such a rapid takeoff rises by a factor between 3 and 10. This calculation ignores the macroeconomic adjustment costs that I mentioned earlier.

- Indeed, not only does the 1990 by 2010 path impose unnecessary costs; it also results in no significant environmental gains relative to a path that allows emissions to be contained less rapidly, as in Scenario 2. (This assumes that we are able in either event to obtain eventual developing country participation.) Under business as usual, temperatures are expected to rise by about 2.36 degrees by 2100. Stabilization at 1990 levels beginning in 2010 would reduce the temperature rise to 2.15 degrees--a .21 degree Celsius payoff. In contrast a path that peaks in 2015 and returns to 1990 levels by 2040 has a payoff of 0.19 degrees. So the payoff to the extra speed is .02 degrees. Put another way we would succeed in delaying temperature increases by about one year. The limited climatological impact of even an extremely aggressive emissions reductions program measured in terms of temperature impacts during the next century results from extremely long lags involved in the underlying physical processes, and the dependence of temperature on the total stock of carbon dioxide in the atmosphere, rather than the flow of emissions at a given time. Emissions reductions do matter to temperature, but over an extremely long horizon. The cumulative nature of the process suggests that there is little loss in starting slowly. The addition to the total stock of carbon from a slow rather than from a fast start to abatement will be very small fraction of total atmospheric carbon: the difference in carbon emissions over the decades of this takeoff period is only a small fraction of total emissions, and the stock of carbon in the atmosphere is itself the result of many prior decades of emissions.

- If the price of energy increases by the amount contemplated under a 1990 by 2010 scenario there will be serious sectoral effects--industries like coal and electric utilities as well as energy intensive industries and their workers would be quite seriously affected. There would also be significant regional effects.

- Finally, there is the issue of carbon leakage. Even if the failure to include developing countries in the proposal does not lead U.S. firms to move operations resulting in the kind of adverse competitive effects that businesses fear, carbon emission reductions in the U.S. could be offset partially by increased emissions abroad through a number of channels including international shifts in the location of production (lower oil prices; the expansion of energy intensive output abroad can result in significant leakage if foreign industries are less energy efficient than those in the United States.) Estimates of carbon leakage range from 3.5% to 70%.

Impact of Annex I trading:

- Annex I trading--assuming that it can be effectively implemented (which is questionable unless all Annex I countries adopt tradeable permit systems)--would permit the United to satisfy a portion of its emission reduction requirements by purchasing permits from other

countries that can reduce emissions at lower costs and are willing to sell us permits.

- Such trading will result in substantial international transfers. It is likely that we would purchase permits from the FSU and Eastern European countries resulting in substantial international transfers--on the order of $5 -8 billion by 2010 according to IAT simulations.

- International trading is probably unworkable due to the fact that to operate smoothly, every country has to use a permit trading system, so that international trading is an extension of private markets. I know of no country that intends to adopt permit trading. Many will use command and control or energy taxes. In this event, trading is a govt. to govt enterprise, dominated by politics and probably infeasible. Monitoring and enforcement mechanisms are also important--there will be a strong incentive in weak enforcement countries to counterfeit permits and sell them for hard currency on the intl. market.

- The choice of 1990 as a baseline for emissions reduction rather than a later year is disadvantageous for the United States vis a vis Europe because we are currently 12% above 1990 levels whereas Western Europe is about even with 1990 levels. Western Europe plus the FSU and Eastern Europe are well below 1990 levels--by 5 to 8%.

There is a more rational way to achieve our environmental goals but it doesn't correspond to the current slogans. The U.S. could commit to eliminate emissions growth by 2010 and reduce to 1990 levels by say 2040. This plan could be achieved through an auction permit system or through a carbon tax but the needed tax would be much smaller--perhaps $5-20 resulting in revenue of $6 to $25 billion.

- Again assuming that to implement this plan it is necessary to achieve all emissions reductions domestically: elimination of domestic emissions growth could probably be achieved with an increase in the price of carbon emissions in the range of $5-$10 by 2010 and rising over time thereafter. It would be necessary to take steps at the outset to raise the price of carbon emissions, but the price increase would initially be small and would have to rise somewhat over time. Gas prices would rise by roughly 2-3 cents initially with comparably smaller impacts on coal prices. A significant R&D program would also be needed.

- The effect on families would be noticeable ($10-$100 per year from increased energy costs) but substantially less than under the first scenario.

- This plan sets a goal that can be obtained with a defensible and prudent level of intervention in the economy.

- **This plan sacrifices virtually nothing on the environmental front and it results in an enormous decline in costs relative to the first plan.** This is true for the reason I

mentioned earlier--**the 1990 by 2010 program is so aggressive as to be is inefficient.** This point is well known among economists and they would criticize a much more aggressive plan on these grounds--that it is needlessly costly and hence economically irresponsible. Economists have tried to demonstrate this point by looking at how the total costs of achieving a fixed environmental goal vary with the aggressiveness of the initial reductions. To be specific, suppose that we were committed to attain the ambitious goal set out in the Framework Convention, which calls for policies to "achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." We would recognize that what matters to global temperature and to the environment ultimate is concentration levels, and not emission levels at a given time or short span of time. Roughly, what matters is aggregate emissions over very long time spans. Suppose further that we had decided that it is important to stabilize concentrations at 550 ppmv--roughly a doubling from preindustrial levels and developing countries were willing to agree to emissions reductions as their per capita income approaches ours.

- Research shows that a timetable designed ultimately to stabilize atmospheric concentrations at 550 ppmv whereby US emissions would *peak* around 2010-2020, reach 1990 levels by 2030-40, and continue to decline even further would reduce costs by from 50 to 85% in comparison with the costs of a program that attains the same goal along a path in which domestic emissions are brought down right from the outset. To give a sense of magnitudes, a number of models place the cost to the OECD of stabilizing concentrations at 550 ppmv along a path that begins by with immediate reductions at around 6 trillion dollars with no trade. (This is the present value of lost consumption) whereas a path that peaks around 2010 and declines gradually thereafter costs only under $2 trillion in most models.

- Cost effective emission reductions strategies normally involve an initial phase in which actual emissions approximate the baseline or business-as-usual (BAU) path. (That period is longer the higher the ultimate concentration goal.) This more extended timetable for emissions reductions mitigates the costs associated with premature capital stock obsolescence and provides time for research and **development to yield new, superior energy-savings technologies and low cost fossil-fuel substitutes.** In addition, postponed costs are lower costs because, with a positive return on investment, fewer resources need to be set aside today to meet future costs. 1990 by 2010 is like trying to ask an ocean liner to change course abruptly. It is virtually impossible because it has too much momentum. It is capable of changing course, but it can't turn on a dime.

- Cost-effective emissions strategies do entail policy actions from the outset, however. So, although such strategies could be criticized as initially unaggressive from the standpoint of emissions, they entail meaningful policy action. In order to create appropriate incentives for emission reductions over time and the

development and adoption of appropriate technologies, the price of carbon emissions must be increased at the outset of such a program. Gradual emissions price increases are also necessary over time. In comparison with the "1990 by 2010" program, however, the initial carbon emissions prices is apt to be substantially lower.

Problems with International Trading

- Not all countries will adopt a permit system. Thus trade becomes a govt. to govt. negotiation.
- Without monitoring of emissions, there are possibilities for scamming.

Technology Optimism:

- All of our analysis assumes an improvement in energy efficiency of close to 1% per year with flat prices which requires progress on these programs.
- Technology is crucial but to get technology produced and adopted there has to be a profit motive which comes into play with a price increase. We saw this operate during the oil shock period.
- NAS and DOE see opportunities for a free lunch, but must explain how these savings can be generated--what policies and at what costs?
- Even DOE believes a $50 permit price is needed to achieve 1990 by 2010.