Testimony
of
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Mr. Chairman, Senator McCain, and members of the Committee, I am pleased to appear before you this morning to discuss the Administration's climate change policy. On February 14, President Bush announced his effective and science-based strategy for moving forward on climate change. This strategy establishes environmentally and economically sensible goals, concrete steps to meet the goals, and a balanced portfolio of research, emission reductions, and international cooperation.

The U.S. strategy has three-prongs: slowing the growth of net greenhouse gas (GHG) emissions, laying important groundwork for both current and future action, and working with other nations to develop an efficient and effective global response. This strategy builds on the Administration's June 2001 commitment to improve our understanding of the causes and potential harms posed by climate change, and to develop technologies that offer promise to significantly slow the growth of emissions. It is also the first step in a long-term commitment to slow and, if the science justifies, stop and then reverse the growth of GHG emissions. Importantly, it takes advantage of our growing experience with building better and more flexible institutions to address environmental problems—a topic discussed at length in this year's *Economic Report of the President*.

The first element of the United States climate strategy is slowing the growth of our GHG emissions. The President set a national goal of reducing U.S. greenhouse gas intensity (GHG emissions per dollar of GDP) by 18 percent over the next ten years. Like an absolute emissions target, an intensity reduction of this magnitude requires real effort. Unlike an absolute emission target, an intensity target will not inadvertently hurt our economy.

The second element focuses on creating a solid foundation for current and future policies—investments investments in science, technology, and institutions. Better science promotes better decision-making. Better technology offers the promise to slow emissions growth significantly. Better institutions enable us to pursue the lowest-cost emissions reduction opportunities, whatever they may be, whenever they arise over time, and wherever they occur both within and across nations. Improvements in the existing voluntary registry of greenhouse gas emissions, along with transferable credits for real emission reductions, are an important part of this institutional foundation. The registry improvements include better measurement and verification of the different greenhouse gases emitted by a wide variety of sources and activities, providing greater confidence in the reported results and encouraging firms to take account of their emissions. Credits for real emission reductions provide a mechanism that allows firms to avoid being penalized under any future climate policy or be rewarded under any future incentive policy, provides tangible evidence of the impacts of voluntarily adopting superior technologies, and provides incentives to curb future emissions.

The final element of the President's approach incorporates international efforts, recognizing the critical importance of developing-country participation in any effective international response to climate change. This participation includes both near-term efforts to slow the growth in emissions and longer-term efforts to build capacity for future cooperation.

Importantly, the President's approach addresses key shortcomings of the Kyoto Protocol. These shortcomings include an arbitrary short-run emissions reduction target that was far too severe given the long-run aspects of climate change and remaining scientific uncertainties, and that was unresponsive to economic growth. Indeed, as I will note below, reductions from domestic sources in 2012 under the President's approach are expected to be roughly comparable to those anticipated under the Kyoto Protocol, but without the Protocol's undesirable features. The Kyoto Protocol's focus on near-term *targets*, rather than on building up the *science*, *technologies* and *institutions* that could minimize the economic impact of meeting long-run goals, is particularly faulty given the limited ability to mount a flexible and cost-effective response in the near term. Finally, the Kyoto Protocol failed to include developing countries, limiting the effectiveness of any international effort.

A Journey of a Thousand Miles Begins With a Single Step

While the potential for human-induced climate change is real and deserves serious attention, there is significant uncertainty about how increases in concentrations translate into changes in temperatures and climate patterns, especially on regional and local levels. Global climate models, with all their uncertainties, are unable to predict regional and local impacts reliably. The role of natural variation in climate is not well understood. There is still more uncertainty about how temperature and changes in the climate would impact the environment and human populations. In addition, the extent to which concentrations will rise in the future is unclear because neither future emission trends nor potential absorption of emissions by the ocean, vegetation, and other "sinks" is known with certainty.

These large uncertainties underlay the President's decision in June 2001 to focus spending on climate-related research, by creating the U.S. Climate Change Research Initiative. This initiative will identify and study priority areas where increased research can make the most significant strides toward reducing uncertainty. Over the next year alone, the United States will spend $1.75 billion for basic research on climate change.[1] Indeed, the United States will spend as much as the rest of the world combined on research in this important area.

A distinguishing characteristic of climate change is that any successful effort to address the potential risk of climate change from most greenhouse gases will stem from cumulative efforts over decades, not just a few years. In 2000, for example, global CO_2 emissions contributed to an increase in atmospheric concentrations of less than 0.5 percent,[2] a small increase compared to the 20 percent to 200 percent increase in concentrations that researchers often propose as a possible long-term stabilization goal.[3] As substantial changes in concentration only result from cumulative emissions over a period of decades, the future benefits of efforts to reduce emissions will be nearly the same whether the reductions, ton for ton, occur today or years in the future.

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[1] See Global Climate Change Policy Book, http://www.whitehouse.gov/news/releases/2002/02/climatechange.html

[2] Data Source: C.D. Keeling, T.P. Whorf, and the Carbon Dioxide Research Group, Scripps Institution of Oceanography (SIO), University of California, La Jolla, California. See http://cdiac.ornl.gov/ftp/ndp001/maunaloa.co2

[3] This calculation is based on increasing from current concentration levels of approximately 370 ppmv to future stabilization targets ranging from 450 to 750 ppmv. See "Climate Change 2001: The Scientific Basis," Intergovernmental Panel on Climate Change: Working Group One, Third Assessment Report, page 14 (http://www.ipcc.ch/pub/spm22-01.pdf) and C.D. Keeling, T.P. Whorf, and the Carbon Dioxide Research Group,

The uncertainty surrounding the ultimate consequences of climate change and the necessity of a long-term effort to address it combine to suggest that severe and costly near-term measures to reduce emissions are not warranted. Instead, a serious but measured first step is in order. A helpful analogy is posed by M.I.T. economist Richard Schmalensee and his colleagues: If you smell smoke in your house, it would be silly to do nothing until you actually see flames, but you also should not hose down the house after one whiff of what might be smoke.

Starting in the Right Direction

President Bush responded to the need for a serious but measured response by calling for an 18 percent reduction in greenhouse gas intensity (emissions of greenhouse gases per dollar of economic output) by 2012. As the President explained, this is the first step in a policy that will first slow, and if the science dictates the necessity, stop and reverse growth in greenhouse gas emissions (see Chart 1). There are two important features of this goal—the way in which the goal is defined based on GHG intensity, and the specific 18 percent target.

Redefining Short-term Goals

Most discussions of goals for slowing the growth of greenhouse gas emissions at the national level have focused on absolute emission targets, exemplified by the Kyoto Protocol. Meeting absolute emission targets can be costly, however, because of the substantial uncertainty regarding how difficult it will be to meet them. This uncertainty about the difficulty or cost associated with achieving an absolute target is, in turn, primarily driven by uncertainty regarding how emissions would grow absent such a target and therefore the reductions required to meet it. The Intergovernmental Panel on Climate Change recently developed a number of possible scenarios for growth in emissions over the coming century. While it is not surprising that projections for growth over a century may vary widely, it is somewhat surprising that the various scenarios of potential growth in CO_2 emissions from 2000 to 2010 alone ranged from under four percent to almost 40 percent.[4]

Scripps Institution of Oceanography (SIO), University of California, La Jolla, California. See http://cdiac.ornl.gov/ftp/ndp001/maunaloa.co2

[4] See "Emission Scenarios," Intergovernmental Panel on Climate Change: Working Group Three, pages 247, 386, and 511.

Much of the significant variation in projections of emissions growth reflects uncertainty about future economic growth. Indeed, Chart 2 shows that, while emissions growth rates varied substantially across countries during the 1990s, much of this variation can be explained by differing rates of economic growth (hence the upward sloping pattern when these variables are plotted together). Moreover, looking at changes in emissions growth rates across time, Chart 3 shows that while U.S. GHG emissions growth over the past two decades was somewhat erratic, it has closely tracked economic growth. This correlation is largely due to the impact of economic growth on demand for energy and, in turn, the GHG emissions associated with the generation of that energy. The relationship is not exact, of course; energy efficiency has improved throughout the years, and nuclear power and renewable sources for electricity generation, among other factors, have limited the growth in fossil fuel use necessary to meet rising energy demands. Nonetheless, economic growth continues to be the key driver of emissions growth. By acknowledging and incorporating this relationship, an intensity-based goal linked to changes in economic output reduces uncertainty about the required level of effort.

Just as an absolute goal, an intensity-based goal could be viewed as establishing a target for future emissions. The expected tonnage target equals the intensity goal times the expected level of economic output:

Expected Tonnage Emissions Target (tons of carbon)	=	Intensity Target (tons of carbon per dollar)	×	Expected Economic Output. (dollars)

If economic growth were *certain*, then the two types of goals would be identical. However, the most fundamental feature of climate change is uncertainty, and the pace of economic growth is one source of uncertainty. For this reason, the previous Administration, in discussing developing country participation in the Kyoto Protocol argued that "An emissions target … could be indexed to a country's economic performance (such as GDP) … Such targets could avoid a crunch arising from faster than projected economic growth between now and the commitment period."[5]

Thus, if economic growth is as expected, an absolute target can mimic the intensity target. However, if economic growth turns out to be much faster than expected, the intensity

[5] See *Economic Report of the President 2000*, Washington: U.S. Government Printing Office, Box 7-6, page 269.

target flexibly adjusts the tonnage target upward to permit taking advantage of the benefits of additional resources from growth. Should growth be slower than expected, the intensity target permits a lower tonnage target in a way that an absolute emissions goal cannot.

The long-term, cumulative feature of the climate change problem implies that the economic advantages of an intensity-based goal come with minimal environmental disadvantages. To see this, if an intensity-based goal results in higher than expected emissions over the next decade, then more aggressive emissions reductions can remedy the problem in the future with little consequence for the environment.

Designing a More Responsible Path Than Kyoto

Reaching a goal of 18 percent reduction in emissions intensity will require real effort over the next decade. In the past, emissions intensity has gradually fallen as a result of investment and innovations producing a number of significant changes in the economy: An increasing share of less energy-intensive sectors in national economic output, technological advances in pollution control and the cleaner use of fuels, and reductions in the emissions-intensity of electricity production due to (among other factors) the increased contribution of natural gas and nuclear power to electricity production. Even as these trends continue, independent forecasts by the Energy Information Administration predict only a 14 percent further improvement in emissions intensity over the next ten years.[6] The President's goal will require emissions intensity to fall 30 percent faster, resulting in a four and one-half percent—or 100 million metric ton (carbon-equivalent)—*additional* decline in 2012 emissions relative to the EIA forecast (see Chart 4).

The President's four and one-half percent reduction plan results in roughly the same volume of domestic reductions as envisioned by the previous Administration. In March 4, 1998, testimony before the House Subcommittee on Energy and Power concerning the Kyoto Protocol, CEA Chair Janet Yellen argued that *with* key developing country participation and an efficient trading program (neither of which is true under the Kyoto Protocol under the Marrakech Accords), the U.S. would reduce between 100 and 150 million metric tons of carbon relative to business as usual. While I am skeptical that these developing countries would voluntarily agree

[6] See Addendum to the Global Climate Change Policy Book, http://www.whitehouse.gov/news/releases/2002/02/addendum.pdf

to emission limits under the Protocol and, even if they chose to participate, that they could efficiently trade in emission reductions, I do agree that domestic reductions of 100 million metric tons relative to forecast 2010 levels is a reasonable target. [7]

The four and one-half percent reduction is also comparable to the average reductions required under the Kyoto Protocol for countries remaining in that agreement. Chart 5 shows the U.S. commitment alongside estimates of the average required reductions for the remaining countries with emission limits under the Kyoto Protocol. While some regions, such as Canada and Japan, have particularly onerous targets, others, such as the transitional economies of the former Soviet Union and Eastern Europe, have targets far exceeding their forecast emissions—hot air. According to one set of estimates by the Energy Information Administration, this hot air exceeds the needs of other countries with actual reduction targets, with a net effect of zero required average reductions. Put more starkly, the overall target would be met by using undesirably poor economic growth in some countries as the route to compliance in the remainder. Another set of estimates from a group at MIT shows required average reductions of 7.2 percent. Viewed together, these forecasts suggest an effort to reduce emissions among remaining Kyoto countries that is roughly comparable to the U.S. commitment.[8]

Developing a Long-term Response to a Long-term Problem

Reducing greenhouse gas intensity requires a portfolio of policies including both research on future reduction technologies as well as investment in current technologies. Each potential short-term effort to limit the growth of GHG emissions should be evaluated in comparison with the option to shift effort to later decades, while still maintaining the same long-term cumulative reduction goal and desired level of environmental protection. Two alternative schedules of emissions reductions can lead to different levels of emissions over time, but the same ultimate level of GHG concentrations. The appropriate choice between paths that differ in near-term

[7] See Testimony of Janet Yellen, Chairman, Council of Economic Advisers, on H271-9 before the Subcommittee on Power and Energy of the House Committee on Commerce, page 323, lines 26 and 29.

[8] See Energy Information Administration (EIA), *International Energy Outlook 2001,* DOE/EIA-0484(2001) (Washington, DC, March 2001); and John Reilly, MIT Joint Program on the Science and Policy of Global Change, Snowmass Summer Workshop (August 6, 2001). The *IEO 2001* estimates that total required reductions among the Annex I countries (those required to reduce emissions under the Kyoto Protocol) would be 554 million metric tons in 2010. Of that, the United States' burden is 558 million metric tons (page 14), leaving a marginal surplus of reductions—without any further effort—among remaining participants after U.S. withdrawal from the Protocol. The MIT study provides slightly higher estimates of the burden among remaining participants (7 percent, or 290 million metric tons).

versus long-term emissions reductions depends on whether we can reduce overall costs by spending more on research and less on emission reductions now, in order to achieve greater, but significantly cheaper, emission reductions in the future thanks to improved technologies. It also depends on whether reductions now require early retirement of productive assets; throwing away something valuable is a real cost. Consideration of the appropriate timing of emissions reduction is all the more important because the cost of achieving reductions over a short horizon increases dramatically with the scale of reductions. One estimate suggests that a 30 percent reduction in emissions in the near term is six times more expensive than a 15 percent reduction. That is, doubling the near-term reduction target increases costs sixfold.[9]

A substantial body of research has examined this issue of balancing current and future emission reductions.[10] It has focused on the key features of the climate change problem—the uncertainty associated with the benefits and costs of addressing climate change; the replacement of existing energy-using equipment, structures, and other physical assets required to reduce emissions; and improvements in technology over time. These features commonly lead to two related conclusions. First, there is significant value associated with better information, suggesting a critical role for climate science. Second, the least expensive way to achieve a particular concentration target involves a gradual approach that avoids drastic changes to the capital stock.

In addition to lowering overall costs, a more gradual approach to reducing greenhouse gas emissions reduces the possibility that an unnecessarily onerous economic burden will discourage pursuit of the long-term problem. The long-term response to climate change can be likened to running a marathon, in which the efforts in the next decade are analogous to the first few miles. The 30 percent reduction required of the United States under the Kyoto Protocol would entail progressing a third of the way towards the long-term response in the first ten years. That would be equivalent to sprinting the first few miles of a marathon. The risk of such a strategy is that, after sprinting the first few miles, a runner may be in such pain that she decides to quit the race even though she could otherwise have finished it had she started more gradually.

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[9] Numerous estimates of the cost to the United States of different levels of emissions reductions are presented in John Weyant and Jennifer Hill, "Introduction and Overview," *The Energy Journal* (Special Issue, 1999), page *xxxvii*.

[10] A summary of the research on this topic can be found in Michael Toman, "Moving Ahead with Climate Policy," *RFF Climate Change Issues Brief,* 2000. An additional summary of studies on this topic can be found in "Climate

The Journey's Signposts Are Marked By Institutions

In addition to setting a responsible short-term goal, the President's approach recognizes that cost-effective climate change policies in the future are made possible only by building institutions to facilitate those policies today. Numerous studies demonstrate that taking advantage of low-cost opportunities to reduce emissions, wherever those opportunities occur, reduces the overall cost of meeting an emissions goal.[11] Therefore expanding the set of reduction opportunities targeted by a policy—for instance, by including each of the various GHGs or a wider variety of sources—can substantially lower the cost of reaching a particular goal.

The United States and the rest of the global community are still, however, far from being able to tap fully this flexibility in responding to climate change. On the one hand, the capacity already exists in the United States to encourage efficient reductions from energy-related sources that make up a substantial share of our aggregate GHG emissions. The $4.6 billion in tax incentives for renewable energy and energy efficiency programs in the President's five-year budget plan are examples of this kind of capacity. On the other hand, research suggests that about two-thirds of the low-cost reductions opportunities stem from the very sources for which we do not yet have this capacity; even less capacity exists in other nations. We need to build institutions to capture these opportunities.

The President's recommendation to improve the nation's voluntary emissions registry and to provide transferable credits for voluntary real emission reductions—these are concrete steps to start building institutions. The improved emission registry will allow improved tracking of emissions from hard-to-reach sources that offer low-cost reductions. Transferable credits for real reductions—including credit for adoption of new energy-saving technologies and practices, reductions of non-CO_2 gases, and sequestration—means that firms seeking insurance against future policy action on, or reward from future incentives for, climate change can obtain it from the lowest-cost sources. This approach fosters the creation of institutions—standards, protocols, technology, and popular awareness—that provide access to inexpensive reductions and help the country meet our emission goals efficiently.

Change 2001: Mitigation," Intergovernmental Panel on Climate Change: Working Group Three, Third Assessment Report, pages 544-552. See http://www.ipcc.ch/pub/wg3spm.pdf

[11] A summary of studies on this topic can be found in "Climate Change 2001: Mitigation," Intergovernmental Panel on Climate Change: Working Group Three, Third Assessment Report, pages 522-523 and 536-542.

Flexibility Matters

In contrast to many environmental problems that result from a specific chemical or a narrow set of activities located in a confined area, the risk of climate change depends on the combined accumulation in the atmosphere of many different GHGs emitted from all over the world. While the contribution of a given amount of each GHG to climate change varies according to its relative potency in trapping energy and how long it naturally remains in the atmosphere, emission reductions of the various gases, adjusted for these differences, are equally valuable.[12] Moreover, because atmospheric concentration of GHGs matter, not emissions, sequestration (e.g., absorption into forests and soil) of gases already in the atmosphere provides additional opportunities to reduce climate change risks.

The large contribution of carbon dioxide emissions to overall increases in the atmospheric GHG concentrations implies that reducing the growth in GHG emissions will be important to any long-term strategy to address climate change. Other gases comprised only 18 percent of total U.S. GHG emissions in 1999, while land-use changes and forestry in the United States sequestered the equivalent of roughly 15 percent of total emissions.[13] However, emissions of these other gases and sequestration offer the bulk of inexpensive reduction opportunities for the United States right now—nearly twice as much as carbon dioxide emissions according to a recent EPA study—making it essential to include them in any cost-effective approach.[14]

GHG emissions reductions also have the same climate change benefits wherever they occur – within a company, across the country, and around the world. In sharp contrast to emissions of pollutants like sulfur dioxide and nitrogen oxides that have both local and regional consequences, GHG emissions in Asia—or anywhere else—will have exactly the same consequences for the United States as GHG emissions within the United States. Not only do we want to encourage efficient emissions reductions across gases and activities, but across the country and around the world as well.

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[12] As a result, emissions of greenhouse gases are often measured in tons of carbon equivalent, which weights the emissions of each gas according to the combined effect of its relative potency and residence time in the atmosphere.

[13] See Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 1999,* (April 2001). See http:/www.epa.gov/globalwarming/publications/emissions/us2001/pdf/table-es-1.pdf

[14] See Environmental Protection Agency, *Analysis of Multi-emissions Proposals for the U.S. Electricity Sector, Requested by Senators Smith, Voinovich, and Brownback*. See http://www.epa.gov/oar/meproposalsanalysis.pdf

While the *absolute* estimates of the costs and cost savings associated with various policies are subject to considerable uncertainty and disagreement, flexible policies undeniably lead to large *relative* cost savings compared to less flexible alternatives—if the right institutions are in place.

Flexibility Requires New Institutions

Realizing the potential cost savings from flexible polices as we pursue our 18 percent intensity goal requires a certain set of institutions—regardless of whether the policy is based on voluntary challenges, or tax incentives, or possibly broad-based market programs in the future. Emissions and reductions must be measurable with equivalent treatment for equivalent emission consequences. Incentives are needed to motivate firms to seek reductions. Skills are needed to evaluate incentives and options. Awareness is required to uncover as many opportunities as possible. The President's plan addresses these needs in a creative and responsible manner.

Perhaps the most desirable feature of a flexible system is to encourage the measurement and monitoring of emissions from a wide variety of sources. It is impossible to identify inexpensive opportunities to reduce emissions if emissions cannot be measured. Among greenhouse gases, these emissions can come from widely dispersed sources and/or be difficult to directly or indirectly monitor. The development of standardized protocols—such as the improved emission registry called for by the President—can overcome these difficulties, but it will take time.

Once various emissions are measurable, reductions can be encouraged by an incentive. Here, U. S. policy has challenged businesses to help meet the goal, provided a set of tax incentives to spur certain activities, indicated additional measures may be forthcoming in response to both scientific, technological, and economic progress, and provided a means—the transferable credit system—for firms to protect their current actions from penalization, or to obtain rewards from incentives, under a future policy. By granting credits for real reductions from any source, and allowing anyone to buy those credits, the President has set up a program that allows firms to insure against, or take advantage of, future actions in the most flexible possible way. This approach creates a clear incentive to reduce emissions toward the nation's intensity goal, but because the program is voluntary, no one is compelled to do anything.

The U.S. Approach Provides the Building Blocks

Developing the capacity to address climate change now and in the future will require substantial effort, institution building, and innovation. In his climate change statement on February 14, the President directed the Secretary of Energy to recommend improvements to an existing voluntary registry of emissions reductions established by the 1992 Energy Policy Act. The Secretary's recommendations, sent to the President on Monday of this week, and attached as an appendix to this testimony, emphasize means of improving the accuracy, reliability, and verifiability of measurements of emissions and reductions, as well as means of providing transferable credits for real emission reductions that will avoid penalizing firms for those reductions under any future program.

Improvements to the existing emission registry address one of the institutions required for a flexible policy—improved standards and protocols for emissions measurement from as many sources (and sinks) as possible, treating all real reductions equivalently. The provision of transferable credits, along with tax incentives and the President's national challenge, addresses another: incentives. In addition to the obvious incentives associated with tax incentives and a Presidential challenge, transferable credits provide an opportunity for firms to obtain insurance against, and take advantage of, future climate policy actions. That opportunity is an incentive, one enhanced by several features of the President's initiative.

First, the President has indicated that these credits should protect firms who reduce their emissions now from penalization, or permit rewards from incentives, under any future policy. This protection *per se* has value. The creation of such a hedge is analogous to the purchase of automobile insurance—a fixed expenditure now that may become more valuable precisely in the face of an adverse outcome (stricter emission limits in the climate context or an auto accident in the insurance context).

Second, the credits are only given for real reductions, as determined by an accurate, reliable, and verifiable emissions registry. As the existing registry is improved and the rules for crediting are developed, they will be designed to create the utmost confidence in the measured reductions. It is this confidence, as much as statements and statutes, that ensures that future policy will honor these credits in later years—if the science, technology, and economic considerations require it.

Third, the credits are transferable, allowing businesses that want to insure against penalties, or take advantage of incentives, in future policy and even speculators to purchase these government-sanctioned reductions—regardless of their own reduction opportunities. Firms and individuals with the greatest interest in hedging against future climate policies may want more credits than they can generate through their own reduction opportunities. Likewise, firms and individuals with significant low-cost reduction opportunities may not want as many credits as they can generate. Trading allows those who want more credits to buy them from the cheapest sources, inside or outside of their own firm.

Regardless of whether one is concerned about encouraging voluntary reductions now, or preparing for possible cost-effective responses in the future, registry enhancement and transferable credit for real reductions create the right institutions for current and future policies.

A Successful Journey Requires Broad Participation

The U.S. climate change initiative has taken a number of explicit steps to develop an efficient and practical international response to climate change, and a number of its domestic elements have significant implications for broadening international participation. A major focus of the new approach is increasing the capacity of developing countries to contribute to international efforts to address climate change. The participation of developing countries is critical for two reasons. First, in the long run, the ability of any effort to mitigate effectively potential human-induced climate change depends on the participation of developing countries as those countries make up a majority of total GHG emissions now and much of the expected growth in coming years. Second, many low-cost opportunities for reducing net GHG emissions can be found in developing countries. Ignoring these opportunities raises the overall potential cost of addressing climate change for the world as a whole.

The United States is providing assistance to increase the capacity of developing countries to address climate change. The President has requested $50 million to fund tropical forestry conservation in developing countries; up to $40 million of these funds may be used for the Tropical Forest Conservation Act, reducing countries' debt burdens while protecting existing greenhouse gases sequestered in forests and biomass. In addition, the President has requested $178 million in funding for the United Nations' Global Environment Facility. The Global Environment Facility funds the extra costs (over normal development costs) of reducing

greenhouse gas emissions in energy and other projects in developing countries. The President has also requested $156 million for climate change programs through the U.S. Agency for International Development. Also, the President has focused on helping developing countries prevent illegal logging.

Efforts by developing countries to limit GHG emissions will be promoted by these direct steps, and also by the introduction of an intensity-based goal and development of improved methods for measuring and crediting emissions reductions. A key concern for developing countries contemplating efforts to reduce GHG emissions is how absolute, Kyoto-like, emissions targets could limit opportunities for economic growth. In contrast, an intensity-based approach explicitly takes account of economic growth, adjusting the emissions goal in tandem with changes in economic output. By shifting toward such a goal, one can highlight a way of defining short-term goals that would be more attractive to developing countries than are absolute targets. Note that an 18 percent intensity goal, adopted by all nations over the next ten years, would lower world emissions by more than 800 million metric tons relative to forecast levels.[15]

Standardizing means of measuring net emissions from a wide variety of sources through registry enhancements also has implications for developing-country participation. For many developing countries, energy-related activities are a much smaller share of total GHG emissions, while more difficult to measure activities—for example, agriculture—are an even greater contributor than in the United States.[16] An improved ability to measure reductions in such emissions will enhance the capacity to tap into cheap emissions reduction opportunities in those developing countries. At the same time, not only will efforts to reduce the growth of GHG emissions occur at a low cost, but they may also yield health benefits in developing countries by reducing emissions of harmful pollutants.

A Balanced Approach Is the Way to Move Forward

The Administration's approach to climate change carefully balances the need for immediate emission reductions, the need to develop strong, flexible institutions, and the need to

[15] This estimate is based on world GDP and carbon dioxide emissions forecasts from Energy Information Administration (EIA), *International Energy Outlook 2002,* Tables A3 and A10. See http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2002).pdf

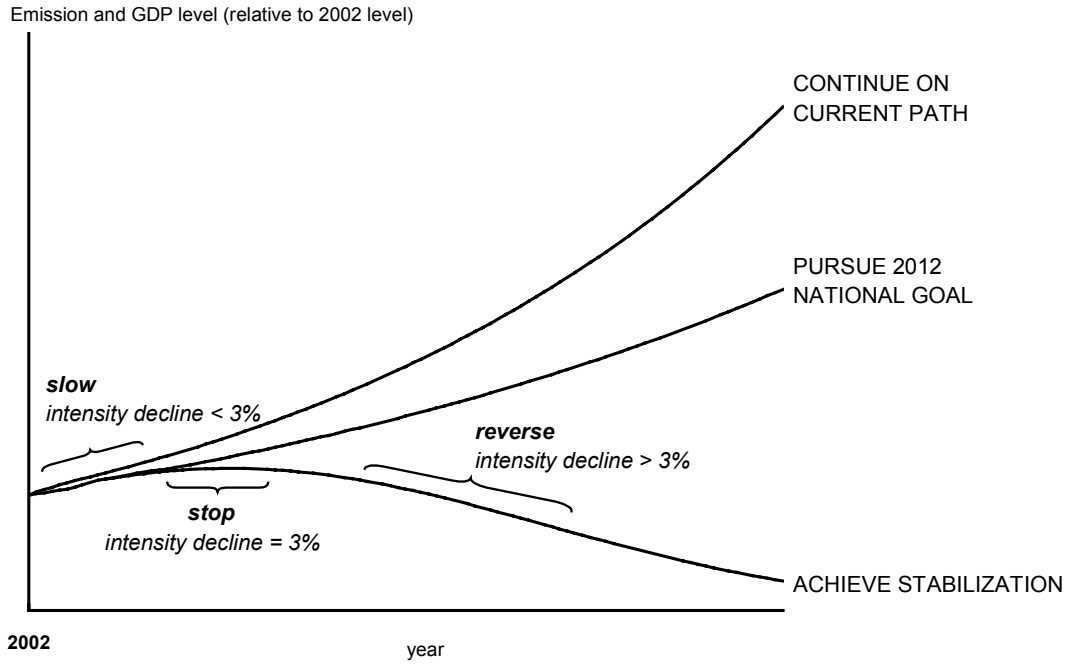
[16] See "Asia Least-Cost Greenhouse Gas Abatement Strategy: India National Report," Table no. 1-1. Manila: Asian Development Bank, ADB-GEF-UNDP, 1998. See http://www.ccasia.teri.res.in/country/india/ghg/tables.htm

learn more about the science and available technologies. First, the approach sets an intensity goal that requires real reductions while accommodating economic growth. Voluntary programs coupled with more than $4.6 billion in tax incentives over the next five years offer businesses and individuals opportunities and incentives to meet the goal. Second, the approach develops knowledge and institutions to address policies in the future. An enhanced emission registry, transferable credit for real emission reductions, $1.2 billion for technology research, development, and deployment to reduce emissions, and $1.7 billion for fundamental science this year related to climate change are substantial investments in our future capacity to address climate change. Finally, the approach emphasizes the importance of international, and especially developing-country, cooperation—looking for opportunities but recognizing constraints. These opportunities include both bilateral efforts (e.g., debt-for-nature swaps and technology transfer programs) and multilateral efforts (e.g., funding for the Global Environmental Facility and the illegal logging initiative).

Most importantly, the U.S. approach looks beyond the next decade. Climate change is a long-term issue that for too long has been mischaracterized as a short-term crisis. In particular, divisive efforts to seek dramatic short-term reductions ignore the need for a long-term architecture that is flexible in the face of economic growth and can adjust to new information. Intensity targets are a more sensible way to think about the evolution of goals, as absolute emission targets tend to penalize growing economies—precisely the countries that need to be included for an international response to work. Improved science, technology, and institutions are more valuable—and more achievable—than dramatic emission reductions right now.

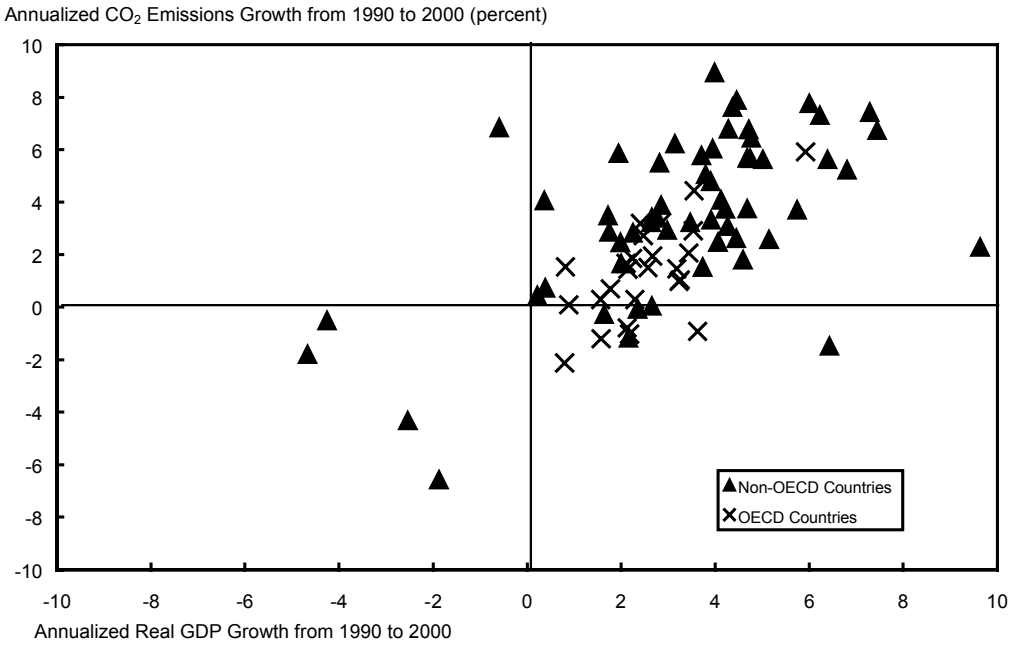
Thank you, Mr. Chairman. I look forward to answering any questions you or members of the Committee may have.

Chart 1 **Path to Long-Term Stabilization**
An 18 percent reduction in greenhouse gas intensity by 2012 is the first step in a policy that will first slow, and if the science dictates the necessity, stop and reverse growth in greenhouse gas emissions.



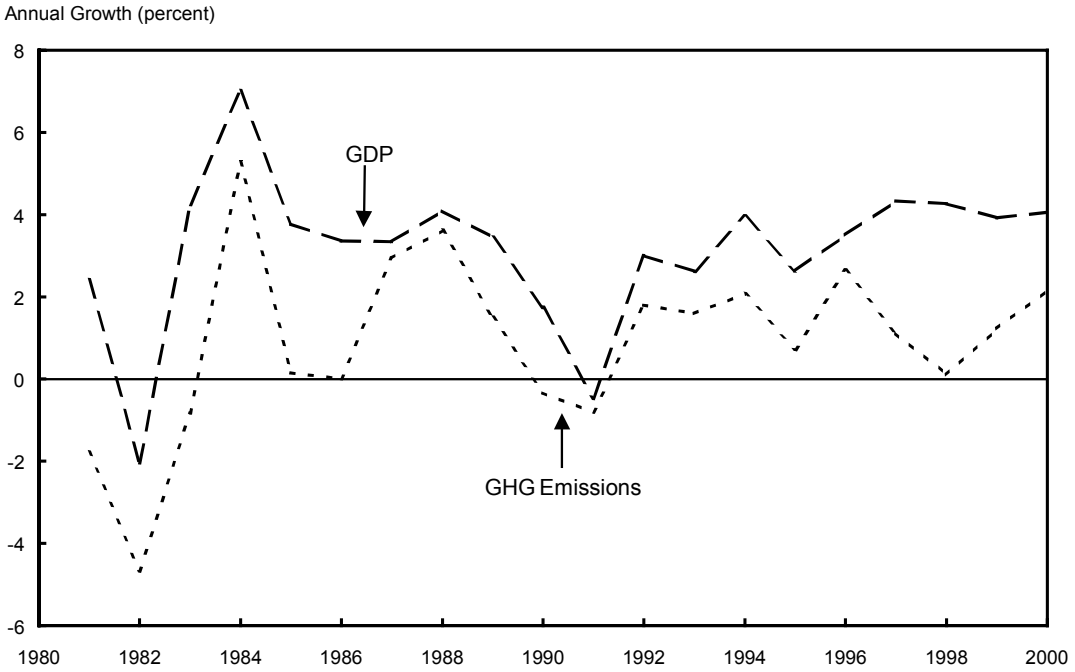
Source: Department of Energy (Energy Information Administration).

Chart 2 **Growth in GDP and CO_2 Emissions in OECD and Non-OECD Countries: 1990 to 2000.**
Much of the difference in the growth of CO_2 emissions across countries can be explained by differences in economic growth rates. This relationship holds for both developed and developing countries.



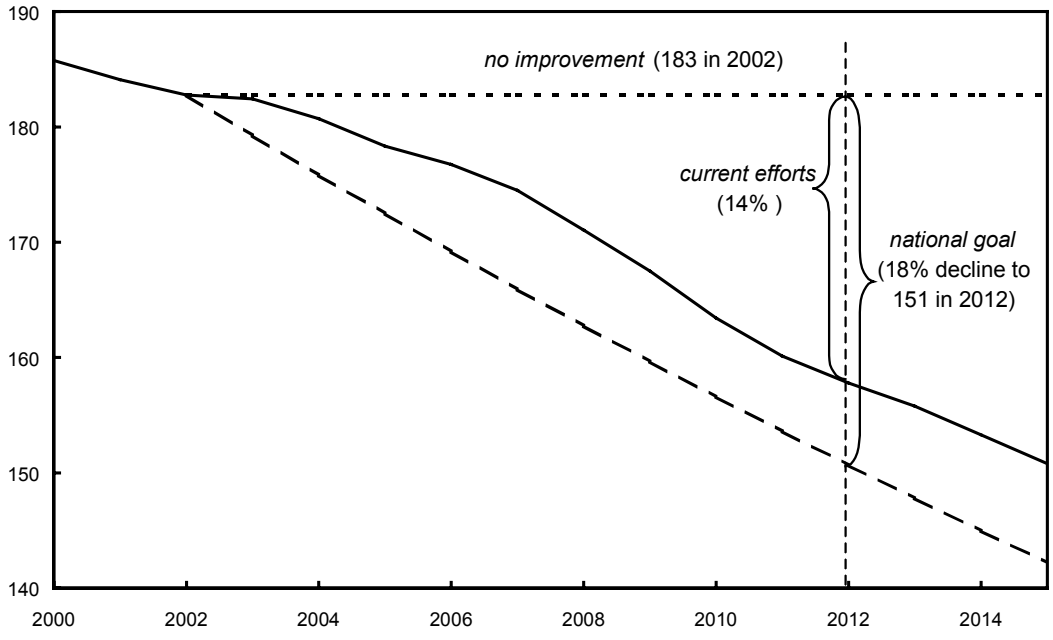
Source: Department of Energy (Energy Information Administration).

Chart 3 **U.S. Economic and GHG Emissions Growth: 1981 to 2000.**
While annual GHG emissions growth has varied substantially over the past two decades, it has closely tracked variation in economic growth.



Source: Department of Energy (Energy Information Administration).

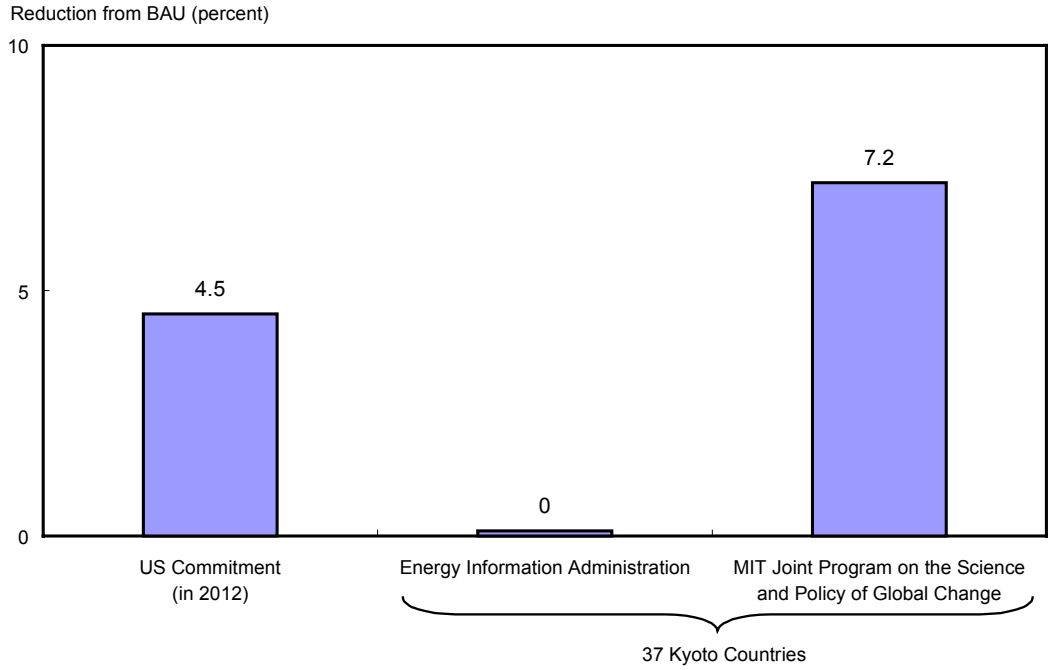
Chart 4 **Reduce GHG Intensity 18% Over the Next Decade.**
The President's goal requires emissions intensity to fall 30 percent faster than current efforts, resulting in a 100 million metric ton (carbon equivalent) *additional* decline relative to the EIA forecast.



Source: Department of Energy (Energy Information Administration)

Chart 5 **Reductions from Forecast Levels**

U.S. reductions from forecast levels are consistent with the average reductions in Kyoto countries.



Source: Department of Energy (Energy Information Administration) and MIT Joint Program on the Science and Policy of Global Change.

July 8, 2002

The President
The White House
Washington, DC 20500

Dear Mr. President:

The Department of Energy's Voluntary Reporting of Greenhouse Gases program has been operational since 1994. The program records the results of voluntary measures to reduce, avoid, or sequester greenhouse gas emissions. In your February 14, 2002, climate change announcement, you recognized the need to enhance the greenhouse gas registry by improving the program's accuracy, reliability, and verifiability as a means of more effectively promoting innovative and effective ways to reduce greenhouse gas emissions. An enhanced registry will encourage participation by increasing confidence that actions are accurately recorded and credited.

On February, 14, 2002, you:

> *Directed the Secretary of Energy, in consultation with the Secretary of Commerce, the Secretary of Agriculture, and the Administrator of the Environmental Protection Agency, to propose improvements to the current voluntary emissions reduction registration program under section 1605(b) of the 1992 Energy Policy Act within 120 days. These improvements will enhance measurement accuracy, reliability, and verifiability, working with and taking into account emerging domestic and international approaches.*
>
> *Directed the Secretary of Energy to recommend reforms to ensure that businesses and individuals that register reductions are not penalized under a future climate policy and to give transferable credits to companies that can show real emissions reductions.*
>
> *Directed the Secretary of Agriculture, in consultation with the Environmental Protection Agency and the Department of Energy, to develop accounting rules and guidelines for crediting sequestration projects, taking into account emerging domestic and international approaches.*

We view the directives to improve the greenhouse gas registry and credit those who voluntarily make real reductions in greenhouse gas emissions as key

components of this Administration's overall climate program. The *National Energy Policy*, the June 11, 2001, climate announcement focusing on science and technology initiatives, and the February 14, 2002, announcement focusing on reaching an 18 percent improvement in greenhouse gas intensity by 2012, clarify the Administration's commitment to:

- Enhance and prioritize research, through the *Climate Change Research Initiative*, to reduce the significant uncertainties that remain on the likely causes and possible long-term effects of global climate change;

- Support focused research and development, through the *National Climate Change Technology Initiative*, to develop and deploy the technologies needed to sustain economic growth and reduce the projected growth in emissions;

- Provide economic incentives to reduce emissions, including tax incentives for hybrid cars, residential solar energy systems, methane capture, combined heat and power systems, and electricity from wind and biomass;

- Encourage voluntary action to achieve real reductions of greenhouse gas emissions and increases in carbon sequestration, in conjunction with more than 60 mandatory, voluntary, and incentive-based Federal programs and similar efforts in the States; and

- Promote new and expanded international cooperation to address climate change, including accelerated adoption of clean energy technologies.

The current Voluntary Reporting of Greenhouse Gases program, created pursuant to the 1992 Energy Policy Act and managed by the Department of Energy's Energy Information Administration (EIA), has been operational since 1994. EIA's *Voluntary Reporting of Greenhouse Gases 2000* contains reports from 222 corporations, associations, and individuals. About half of these reports are "entity" (corporate-wide) reports. In addition, there are 1,882 project-level greenhouse gas and sequestration reports.

In response to your directive, we have undertaken several actions to improve the voluntary greenhouse gas registry and consider options to credit real reductions and sequestration.

First, we initiated simultaneous outreach efforts to the general public; industry; environmental, agricultural, and forestry groups; the financial community; and public policy organizations to solicit views on how to improve the greenhouse gas registry. We also met with fourteen States and several organizations that represent State and local energy and air pollution agencies. We issued a Notice of Inquiry with a 30-day public comment period, which ended June 5, 2002. To date, we have received over 80 sets of comments from a broad cross-section of stakeholders representing a wide range of views. Many written comments came from groups with whom we have met.

Second, we charged an interagency team with identifying options for improving the program. This team critically reviewed the existing Voluntary Reporting of Greenhouse Gases program, examined emerging State programs and international approaches to greenhouse gas reporting, met with stakeholders, and met with managers of analogous government programs in Japan, Australia, and the United Kingdom.

Third, we established an interagency team to identify options for developing accounting rules and guidelines for agriculture and forestry projects. This team is conducting a review of the existing accounting methods for forest and agricultural activities and developing recommendations for establishing standardized reporting guidelines for agriculture and forestry that are consistent with the crediting system.

Fourth, because of the business community's broad interest in voluntary efforts to address climate change, we met with trade associations and companies who may want to take on additional or new agreements to meet the challenge you made in the February 14, 2002, announcement.

Fifth, at your directive, the Department of Energy and the Department of Commerce instituted the cabinet level Committee on Climate Change Science and Technology Integration and the deputies level Interagency Working Group to aggressively move ahead and craft a path forward on our science and technology programs.

During this process, we encountered many significantly different views about what to report, what should "count" as a real reduction, how companies' emissions reductions and carbon sequestration could be credited under future policy, ways to ensure data accuracy, credibility, and transparency, and the importance of consistency between State and Federal reporting systems. We were also encouraged to maintain a fully inclusive process as we consider revisions to the program. The stakeholder process has been very useful and has underscored the need for more thorough public involvement, as outlined below.

We view our primary goal as creating a credible and transparent program to report and credit real reductions that support the national goal of reducing U.S. emissions intensity by 18 percent by 2012. Our discussions – both internally and with our stakeholders – have led us to identify the following recommended improvements to the Voluntary Reporting of Greenhouse Gases program:

1. *Develop fair, objective, and practical methods for reporting baselines, reporting boundaries, calculating real results, and awarding transferable credits for actions that lead to real reductions.* Developing such methods is central to achieving the objective of "measurement accuracy, reliability, and verifiability," as specified in the February 14, 2002, announcement.

2. *Standardize widely accepted, transparent accounting methods.* In 1994, when DOE's voluntary greenhouse gas reporting program was launched, accounting methods were deliberately flexible to promote broad participation. Since then, a large body of work on corporate and project-level emissions, reductions, and sequestration accounting has been developed. The revised and standardized voluntary reporting program will take these methods into consideration and establish a systematic and transparent approach for updating accounting rules as they evolve.

3. *Support independent verification of registry reports.* As the current voluntary program evolves from a reporting program toward a crediting program, it is important to ensure that reports are accurately and consistently prepared and in compliance with specified accounting rules. Requiring independent verification of reports, particularly those that qualify for transferable credits, will enhance the accuracy, acceptability, and credibility of the program.

4. *Encourage reporters to report greenhouse gas intensity (emissions per unit of output) as well as emissions or emissions reductions.* Reporting emissions intensity allows firms to take growth into consideration and is consistent with the overall goal of achieving an improvement in greenhouse gas intensity by 2012. To verify the intensity measures, reporters will need to submit the data necessary to calculate emissions intensity.

5. *Encourage corporate or entity-wide reporting.* The revised voluntary reporting program should encourage corporate or entity-wide reporting. However, many important prospective emission reductions actions, such as those relating to sequestration, energy efficiency, small-scale renewable energy, or actions that reduce greenhouse gases other than carbon dioxide may be difficult to accommodate within the context of entity-wide

emissions reporting. Encouraging entity-wide reporting while allowing for opportunities to report by projects acknowledges the importance of recognizing a broad range of actions and facilitating cost effective ways to reduce direct and indirect emissions.

6. *Provide credits for actions to remove carbon dioxide from the atmosphere as well as for actions to reduce emissions.* Sequestration activities can provide a valuable contribution to meeting our 2012 goal. Providing incentives and recognition for actions to reduce the concentration of greenhouse gases in the atmosphere will facilitate their adoption.

7. *Develop a process for evaluating the extent to which past reductions may qualify for credits.* A process needs to be developed for evaluating these past efforts against the criteria now being developed for consistent and accurate reporting.

8. *Assure the voluntary reporting program is an effective tool for reaching the 18 percent goal.* The enhanced registry and reporting program is one piece of a broad domestic effort to reach our 18 percent goal. It is important to link voluntary programs, such as the Environmental Protection Agency's Climate Leaders and Business Challenges, with reporting guidelines to encourage consistency between private actions and public goals.

9. *Factor in international strategies as well as State-level efforts.* As directed on February 14, 2002, we need to carefully review emerging international approaches, including other national efforts such as those of Australia, Canada, Japan, Denmark, and the United Kingdom (and other Member States of the European Union). In addition, public and private domestic approaches should be closely considered.

10. *Minimize transactions costs for reporters and administrative costs for the Government, where possible, without compromising the foregoing recommendations.*

While this effort is considerably more complex than the creation of the program in 1992-1994, we nevertheless propose an expedited process based on these recommendations and additional ideas we expect to emerge from our ongoing outreach efforts. The process, which will culminate in new guidelines by January 2004, (for reporting 2003 data) includes: several stakeholder workshops; sufficient time to update technical guidelines based on analysis and workshops; public comment periods to review the revised guidelines; development of reporting forms, software, and a public-use database; and required Office of Management and Budget review and clearance of new reporting forms.

We will continue to aggressively pursue the improvements directed in the February 14, 2002, announcement. We are convinced that by creating a process that fully engages the many stakeholders who are concerned about climate change, we can develop a reporting and crediting system with broad support that will result in significant and credible actions to help us meet our climate goals.

Sincerely,

Spencer Abraham

Donald L. Evans

Ann M. Veneman

Christine Todd Whitman