Question 4. Developing Country Participation
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

ACEEE recommends that the U.S. pursue carbon emission reduction policies right away, especially those that are cost-effective and economically efficient in their own right. Energy efficiency policies typically fall in this category. ACEEE research indicates that about 24% of total U.S. electricity use could be saved at a lower levelized cost than the levelized cost of electricity generation[1]. This means that we could significantly reduce electricity demand growth and carbon emissions, while reducing the average cost of electricity, producing positive net economic benefits for all Americans.

We also recommend that international framework convention on climate change continue to engage developing countries (non-Annex 1 nations) on policies and measures that will reduce their greenhouse gas emissions. But we do not believe that any U.S. action on climate should be contingent on equal commitments from developing nations. The United States and other industrialized nations possess the technological know-how and the capital resources to lead the world on clean energy technology, and their policies should place the developed nations in a leadership role. Developing nations can be encouraged to reduce their carbon intensity, to pursue energy efficiency and renewable energy policies that accelerate the de-carbonization of their economies, and can be offered technical and financial assistance to do so. But they should not be held to the same policy standard and timeframe as the developed nations. We would be supportive of policies that tie developing nations to emission reduction commitments, but the developed world should lead by example, and include the developing world as it demonstrates effective action.

As one example, China has set aggressive standards for automotive fuel economy and appliance efficiency, and is now pursuing an energy efficiency resource standard for the economy that will require a 20% reduction in energy consumption per unit of GDP over four years. This equates to about a 4% reduction in energy (and carbon intensity) on an annual basis, which is four times as aggressive as the Bush Administration's nominal target for carbon intensity reduction through 2012. These policies should be encouraged in other countries: as the Chinese have realized, slowing energy demand growth is a key to sustaining their economic growth, let alone reducing carbon emissions. Because this makes eminent economic sense in every economy, these policies should be pursued globally.

[1] Nadel, Steven, et al. 2004. "The Technical, Economic, and Achievable Potential for Energy Efficiency in the United States: A Meta-Analysis of Recent Studies." In *Proceedings of the 2004 Summer Study on Energy Efficiency in Buildings*: ACEEE, Washington, DC.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

ACEEE has no specific comments on this question.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

ACEEE has no specific comments on this question.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Possible incentives to developing nations could include:

- Tying development assistance to implementing established, cost-effective energy policies, such as efficiency resource standards, appliance efficiency standards, utility policies than encourage clean energy development, and building codes.
- Require energy development projects financed by donor institutions to be evaluated in an integrated resource planning framework. This means that new power or other energy projects must be accompanied by efforts to reduce demand growth in the affected sectors, so that the overall need for new supply capacity is kept to a minimum. Financial assistance should be provided to implement the policies and programs needed to realize the energy savings.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

American Electric Power (AEP) does not endorse a mandatory regime or the two-step approach that is contemplated by the White Paper, with the U.S. acting first followed by other nations. AEP does not support mandatory greenhouse gas emission caps unless they are part of a binding international agreement that includes both developed and developing countries, such as China and India. While not endorsing these proposals in the White Paper, AEP believes it is important to fully engage and comment on these questions when requested by the Committee.

Obtaining binding agreements from all major emitting nations is an essential element of any effective global strategy to limit greenhouse gas emissions. The potential risks of climate change stem from CO_2 and other greenhouse gases emitted anywhere on earth. Therefore, any effective global strategy to limit the growth of greenhouse gases must include those nations who are significant contributors to total global emissions, including those in the developing world. It is widely recognized that China is rapidly becoming one of the largest emitters of CO_2, with India close behind. China's use of coal as a percentage of world consumption increased from about 20% in 1985 to over 29% in 2003. By 2025 China will consume almost 40% of the world's coal. The total CO2 emissions of China and India will exceed those of the United States in only three years (by 2009).

S. Res. 98 (Byrd-Hagel) has helped guide our national policy since it passed the Senate on July 25, 1997 by a vote of 95-0. AEP supports this resolution. In his floor statement at that time, and in subsequent floor statements, Senator Byrd stated that his resolution was intended to provide the framework for a binding international agreement that would include mandatory provisions for both the industrialized nations and those countries in the developing world who have the greatest amount of emissions and significantly contribute to the global problem. Following Senate approval and ratification of such an agreement by the United States, those mandatory provisions would then be included in implementing legislation to be considered and passed by the Congress. Senator Byrd also noted that S. Res. 98 would not apply to all developing nations, but only to those who are the largest sources of emissions, and that different types of mandatory provisions would be applied to the developing countries as compared to the industrialized nations commensurate with their levels of economic development. The important premise of S. Res. 98 is that nations like China and India will not take binding steps if they believe that the U.S. will act on its own without requiring comparable actions from those nations, resulting in the practical stipulation that nations like China and India must adopt binding commitments for their own economies simultaneously with the United States as part of a comprehensive international agreement.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

The principles articulated in the resolution establish an important point of reference in developing sensible national and global policy on the climate change issue. This approach is not only appropriate but also essential as the Committee considers a mandatory federal program for limiting greenhouse gas emissions. AEP does not endorse the approach of the White Paper, but in responding to the Committee's question, AEP believes that an effective international approach must be consistent with Byrd-Hagel and include provisions to encourage other nations to take appropriate action. Otherwise, any U.S. cap would be, at best, symbolic and environmentally flawed, while placing our economy at a competitive disadvantage.

Working within the framework outlined in the White Paper, AEP would propose that any mandatory program include straightforward provisions that make it clear the U.S. will not move forward beyond an initial first step, and will suspend that step, if those nations in the industrialized and developing world who are significant contributors to total global emissions do not join us in this effort. Previous legislative drafts proposed that a commission would determine if other nations have joined the U.S., either on a unilateral, bilateral or multilateral basis. If the commission determines that this has not happened, the Congress could pass a joint resolution to limit or stop additional reductions by the U.S. However, the effectiveness of this mechanism is questionable at best. In light of the many years or decades that it takes the Congress to pass major legislation, such a resolution would not be acted upon in a practical time frame. During that time, the U.S economy would be further disadvantaged by the inaction of other major emitters.

Any "two-step" process must therefore include an automatic trigger that would be invoked by the failure of the largest emitters to join U.S. efforts, and this must occur in the early years of the control program or at the end of the initial five-year phase. Such a trigger could be a provision that establishes intensity reduction targets for other nations based on percentages, and these would roughly correspond with the U.S. domestic targets, while taking into account differences between nations such as the greater growth required in a developing economy as it industrializes. The legislation should be structured to require an independent federal board or commission to make an objective factual determination as to whether the major emitters are meeting their intensity targets within a specified time period. A negative determination need not be triggered by a failure by one of the smaller of the significant contributing nations, which contribute only a small fraction of the total global greenhouse gas emissions, but would be invoked if one major nation, such as China or India, fails to act.

If the federal board or commission finds that a major emitting country has not achieved the intensity targets, automatic provisions would be triggered to alter or suspend further implementation of the federal greenhouse gas reduction program. Nations (like companies) will need time to fully implement a national program, and might be close to meeting their intensity goals. In the event that the targets for other nations have almost been met, the legislation could provide that the U.S. safety valve or target could continue but be modified in order to mitigate costs to the U.S. economy. However, the legislation would stipulate that a significant failure by other major emitting nations would result in a suspension of the U.S. program at the end of the initial phase (e.g., 5 years or less). This would be automatic, and provided for in the legislation, and would not require any additional action by Congress. However, the U.S. program would resume when these nations accept their responsibility to address climate change as members of the global community. The combination of suspension followed by a promised resumption of

the US program would provide a powerful incentive to influence the behavior of other large emitting nations, be they industrialized or developing.

This program would not be as effective as a comprehensive global treaty that would comply with the Byrd-Hagel resolution. The implementation and enforcement of a broad treaty would be preferable and more straightforward, as compared with the "two step" program that is contemplated by the White Paper. A comprehensive global treaty is, therefore, strongly preferred and is the approach that is recommended and supported by AEP.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

An intensity goal or cap as explained above.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

The process is described above. The first evaluation of whether the targets in the legislation have been met by the major emitters would occur at the earliest point that is practicable (e.g., at the end of the initial phase or five years at the latest). Other countries would likely take three to five years after the enactment of a U.S. domestic program to follow our lead. Review of targets would occur in three or five-year intervals after the initial phase.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Federal appropriations for foreign assistance programs have significantly declined over the last 30 years and are not likely to be restored. Significant U.S. government aid and assistance is not likely.

U.S. companies may choose to construct more expensive energy efficient plants and facilities in the developing world that would not otherwise be constructed, if the additional GHG reductions could be credited and utilized under a U.S. domestic program. This is easier to implement under a comprehensive multilateral treaty, however.

Design Elements of a Mandatory Market–based GHG Regulatory system
Executive Summary
Submitter's Name/Affiliation: Gary L. Rainwater, Ameren Corporation

Question 4
If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The global effort to address GHGs is necessary to ensure that the U.S. economy is not placed at a disadvantage, and that the efforts are effective. Major trading partners and large foreign emitters of greenhouse gases should take actions that are comparable to those in the U.S. if a U.S. program is established. A lack of comparable action by other nations, both developed and developing, would adversely affect U.S. trade and industrial competitiveness while doing little to address overall GHG emissions. We believe that one of the flaws of the Kyoto Protocol is that it includes no reduction commitments for developing countries. It has been reported that the combined CO_2 emissions from China and India are projected to surpass those of the U.S. by 2009, so it is critical that developing nations also take binding actions to reduce their emissions in order to ensure an effective global response.

Clarifying Question 4a:
What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

A possible metric for comparing efforts across nations is the GHG- or carbon-intensity metric which would seem to be the most appropriate for comparing most advanced economies. The intensity metric recognizes the expected significant growth in energy demand by allowing for the continued growth of emissions, albeit at a slowing rate.

Intensity metric would also appear to be much more suitable than absolute emission reductions to developing countries, who will undoubtedly experience a period of significant growth in energy demand and whose priority concerns are sustainable development as well as a cleaner environment and reduced GHG intensity and emissions. As with developed countries, absolute emission reductions are simply not achievable in the short term given the current energy infrastructure and expected economic growth in developing countries.

Clarifying Question 4b:
What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

A number of issues can be raised when trying to evaluate efforts of other nations to determine if modifications to a U.S. mandatory program should be made. . A U.S.-only program would result in financial and other consequences for entities that do not meet their targets, while their competitors in other countries could potentially face no such consequences for failure to meet their targets. It is important to ensure a comparability of actions among developed and developing countries. As discussed in the response to Clarifying Question 4a, carbon intensity may be one method for comparing other countries efforts provided that there is a robust mechanism to track and verify action.

The timing of evaluations should be dependent on the specific targets and timetables of the programs being pursued by the U.S. and other nations. U.S. reviews should allow for adjustment of the target so that the U.S. does not get significantly ahead of the efforts of other countries. Failure to regularly schedule evaluations could result in financial consequences to the U.S. economy.

Clarifying Question 4c:

Are there additional incentives that can be adopted to encourage developing country emission reductions?

One way to encourage GHG reductions by developing countries is through the recently inaugurated Asia-Pacific Partnership on Clean Development and Climate ("AP6"), which involves key developed and developing country GHG emitters. An important way to ensure actions by all nations is to develop the zero- and less-emitting climate technologies needed to produce the energy that the world demands at a reasonable cost. Technology transfer to developing countries can achieve large near-term emission reductions by closing the gap in emissions intensity between developing and advanced economies. This would involve using such mechanisms as removing obstacles to investment, such as subsidized pricing of energy, lack of protection of intellectual property, and excessive bureaucracy and corruption in developing countries, and creating incentives for U.S. companies to use their best technology and increase their level of investment in developing countries.

Question 4. Developing Country Participation
American Iron and Steel Institute

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

We believe other nations that are major trading partners and key contributors to global greenhouse gas emissions can be effectively engaged without adopting a mandatory cap-and-trade system. We believe some actions can be taken and can be evaluated in terms of the need to take further steps without a mandatory system. Some of the nations that are major developing economies and significant contributors to emissions are unlikely to move toward a mandatory program simply because the U.S. does. A more effective approach is one like the Asia Pacific Partnership for Clean Development and Climate and other bilateral or multilateral agreements, which allows the U.S. to encourage other nations to participate in voluntary technology-based programs that are the key to reducing emissions as those economies develop. The steel industry is actively engaged in the Asia Pacific Partnership program and is working with steel industry representatives in the APP nations, including developing countries, to advance technologies.

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

An energy intensity approach, such as the President's objective to improve energy intensity 18% by 2012, is appropriate for a nation experiencing economic growth. An absolute limit on emissions can only lead to a limit on energy consumption, which is essentially linked to economic growth. A national intensity goal also parallels the goal of the steel industry's goal under the Climate VISION program to further improve energy per unit of steel shipped by 10% by 2012 when compared to a 2002 baseline.

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

It is our impression that the UN Framework Convention on Climate Change established a system for submitting periodic national reports. This procedure appears to be an adequate basis for evaluating efforts in other nations. Bilateral and multilateral agreements such as the Asia Pacific Partnership would also be an effective means of tracking developments in other countries.

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

In addition to expansion of multilateral programs such as the Asia Pacific Partnership, it may be fruitful to draw upon international business and trade groups to take advantage of their contacts, membership, and programs to reach out to nations more effectively than might be possible through governmental channels.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Ultimately, this is a question for governments. However, we believe a mandatory, market based program in the U.S. must go ahead independently of international mechanisms (regardless of the actions of other countries) - starting small and allowing flexibility to evolve/expand over time. Confidence is key for participants, and certainty is needed for long-term investments to be made. A program that contains the potential for significant changes based on the actions of other nations could create massive uncertainty in the system.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

Clarifying Question 4a:

- *What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?*

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

Clarifying Question 4b:

- *What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?*

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

Clarifying Question 4c:

- *Are there additional incentives that can be adopted to encourage developing country emission reductions?*

Investment incentives and the inclusion of emissions reduction credits made in developing countries are one potential means of encouraging investment. There are examples of these types of incentives and programs, such as the Asia Pacific Partnership and portions of the Energy Policy Act of 2005 authored by Senator Hagel, which provide a framework for these activities. Building on these existing programs and including additional incentives such as lending standards and CDM recognition would further support these activities.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Caiteur Group

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The U.S. should consult with other participating nations to understand what those nations are doing, and an evaluation action plan step as proposed by the NCEP is required. However, the actions of the U.S. ought not to be driven by the actions of other nations. We recommend the following approach for the U.S. GHG program based on partner nation status as follows:

- **OECD countries.** Work closely with OECD countries on a regular, open and shared basis and incorporate assessments and results as necessary into the U.S. GHG program. OECD countries, particularly those within the Kyoto Protocol, should be easily share results and impact assessment with the U.S. The U.S. may want to adopt and leverage forward thinking and effective technologies or adaptation activities proven by other OECD countries.

- **Large emerging emitter countries.** The U.S. GHG program needs to consider the results (or lack thereof) of large emitter emerging nations such as China, India, Brazil, and Mexico. The actions of these countries vis-à-vis GHG reductions may pose a risk to the program and result in a need for aggressive emission reduction negotiations. While these countries may be technically considered as "developing" countries, we feel that their large emerging emitter status require annual assessments and evaluations to reduce program risk to the U.S. However again we stress that U.S. climate change actions should not be driven by the actions of other nations.

- **Developing countries.** A different approach is required for developing countries. While oversight action is required for projects and evaluations of progress must occur, the U.S. should encourage and provide incentives for GHG emissions reduction where necessary in developing countries. The World Bank, the Global Environment Facility (GEF) and other established institutions with extensive hand-on experience in developing countries can assist the U.S. with this effort.

See further supporting information from a GHG program evaluation implementation perspective on metrics, evaluation process and frequency, and additional incentives for developing nations in Clarifying Questions 4a, 4b, and 4c.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Caiteur Group

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Metrics that will prove valuable for comparison of developed and developing country mitigation efforts include:

- Measures of national GHG emissions taken over time
- Measures of regional breakdown of national GHG emissions taken over time
- Numbers of projects underway in any country, broken down by type of project (e.g. sequestration, technology-based reduction, etc.) and sector
- Numbers of corporate entities participating in mitigation and trading programs, broken down by large emitter and non-emitter/low-emitter entities
- Numbers of individuals participating in mitigation and trading programs
- Numbers of credits produced from emissions reduction projects
- Amount of leakage from emissions reduction projects

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Caiteur Group

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

The process to evaluate the efforts of other nations should include national-level evaluations with governments bolstered by field-work involving rigorous inspection of select emissions reduction projects underway. Note that U.S. projects should expect similar inspection from partner countries. The result of all efforts and inspections should be kept in a publicly available database.

To lower costs we recommend that the U.S. team with select OECD member countries to conduct inspections in developing countries. This joint-effort team approach is critical to lowering costs given the amount of developing countries that could be potentially included in an evaluation program.

In addition the U.S. should:

- Participate in and leverage the work of **national and globally recognized standards bodies** that provide oversight and verification standards e.g. the International Standards Organization and their ISO 14000 Standards for the Environment that is now being enhanced by the Standards Council of Canada for use on a national scale in climate change and GHG emissions reduction programs.

- Standardize where the liability for credits lie and involve **the insurance industry** in this process. The insurance industry is likely to conduct their own stringent audits of credits they insure, and this will aid the process for the U.S. GHG program.

We recommend that national evaluations occur as follows:

- Evaluations with OECD countries occur annually. OECD countries, particularly those within the Kyoto Protocol, should be easily share results and impact assessment with the U.S.
- Evaluations with large emitter emerging nations such as China, India, Brazil, and Mexico occur annually. While these countries may be technically considered as "developing" countries, we feel that their large emerging emitter status require annual evaluations to reduce program risk to the U.S.
- Evaluations with developing countries occur every two to three years. Annual evaluations will place an unnecessary cost and administrative burden on developing countries whose emitting status does not require such frequency. The World Bank and other established institutions with extensive hand-on experience in developing countries can also assist.

Project inspections in the field, unlike national evaluations, can occur at any time as required for program assessment and evaluation status.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Caiteur Group

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Large emerging emitter countries and other developing countries must be brought into the global emissions reduction programs. Developing countries however need to conduct a significant amount of work to collect reliable emissions data and establish their baselines before they can establish mandatory emissions targets. Additional incentives that can be adopted to encourage developing country emissions reductions include:

- **Vigorous Transfer of Technology and System Infrastructure.** Developed nations such as the U.S. and other OECD countries should share technical and software system advances such as a globally accepted emissions data management standards with developing nations. The U.S. should encourage developing countries to aggressively employ that framework to capture, compute and distribute initial data to establish local and national baseline data.

- **Establishment of Developing Countries' GHG Baseline.** The U.S. and other OECD governments, academia, and private industry must begin to help developing countries establish their GHG baseline well in advance of those countries' participation in mandatory GHG emissions agreements. In particular the U.S. could significantly aid this process by making available to developing countries data from global observation projects such as the Global Earth Observation System of Systems (GEOSS) and Global Terrestrial Observation System (GTOS) under existing U.S. international co-operation agreements.

- **Utilization of low cost Technologies to Capture, Calculate, and Publish Emissions Data.** The U.S. and other OECD governments should show and encourage developing nations to aggressively use the internet, open source file transfer tools, and other low cost technologies to capture, calculate and communicate emissions data in standardized format using globally recognized GHG protocols. Using low cost technologies will not only reduce costs to developing countries but will also ensure robust reporting at field, local, regional, and national levels and more transparency in and access to global emissions data.

- **Publicly Accessible Emissions Information Databases.** The U.S. and other OECD governments should assist developing countries with the funding and technical know-how to establish their national and local emissions data repositories. These repositories should be established with recognized standards that include ability to query across several dimensions, such as geography, industry, and time and must be widely available to interested parties at little or no cost. NGOs and academia should contribute to this repository where applicable.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Caiteur Group

- **A Global GHG Fund for Developing Countries.** The U.S. and other OECD governments should leverage the work of the Global Environment Facility (GEF) and the World Bank's portfolio of Carbon Funds to fund and create a special facility for incentives to developing countries. Using these experience and administrative capacity of these institutions would also lower cost to the U.S. GHG program.

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4. If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The global comparable action should be part of a plan called Contraction and Convergence: The Global Commons Institute, based in the UK, introduced the 'Contraction and Convergence' framework in 1992. C&C proposes to set a goal of per capita equity in carbon emissions, and introduces a convergence period during which allocations progressively move to equality. The 1st World contracts, and the 3rd World converges toward the goal of per capita equity in carbon emissions. This recognizes that climate change is a global problem, and to truly solve it, the entire world will need to be involved. The US should take the first step by making state wide systems which can also function nationally.

Action should not be contingent on other countries actions. However, since Annex I countries (except the US and Australia) are working under the Kyoto Protocol, they have a headstart on the US. We should catch up, and also encourage them to do more.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Center for Clean Air Policy

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

In response to concerns that a mandatory control program will place US industry at a competitive disadvantage to industries in developing countries while failing to achieve climate goals, we suggest use of an active approach in which the US works with developing countries to develop equivalent targets for major energy and heavy industry sectors (e.g., electricity, cement, steel, oil refining, pulp and paper, metals) using a sector-based approach (see www.ccap.org/international/Sector%20Proposal~4-pager.pdf for details on this concept). This approach establishes a process for setting sector targets that use consistent, bottom-up technology based assessments at the start to achieve consistent levels of effort for the industrial sector in developed and developing countries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Center for Clean Air Policy

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Some important metrics for comparison of developed and developing country mitigation efforts with US efforts include 1) the price of carbon allowances, and 2) the level of existing regulation. If carbon allowances in another country are significantly less expensive than those in the US, it may indicate the program is significantly weaker. However, it could also mean there is greater opportunity for cost-effective GHG mitigation measures. Alternatively, if existing regulation in another country is much weaker, this could mean that they should be required to undertake extra effort to make up for past deficiencies.

Another concept worth exploring in understanding comparability is that of sector-based approaches for developing countries. Under this approach, each country would adopt a target that assumes equivalent actions or technologies in each of a number of key industry sectors (e.g., electricity, cement, steel, oil refining, pulp and paper, metals). Such an approach helps to level the playing field for internationally competitive industry sectors. Key metrics include GHG intensities for different industry sectors. Interestingly, contrary to what one might guess, many developing countries have lower GHG intensities than the US for certain industry sectors. As an example, the graph below shows GHG intensities for the cement sector in various countries.

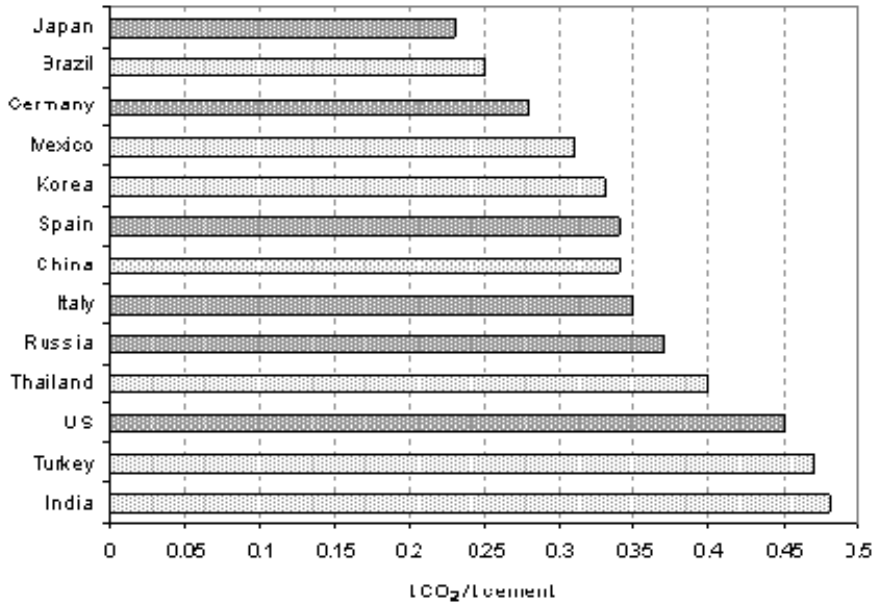

Figure 7. CO_2 emissions intensity of cement production in various countries. Dark and light bars represent emissions intensities in Annex I and non-Annex I countries, respectively. Note that there is no obvious distinction in emissions intensity between these two groups of countries (Hendriks et al., 1999; Price et al., 1999).

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Center for Clean Air Policy

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Center for Clean Air Policy

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Consider joint development of targets covering emissions from major energy and heavy emitting industrial sectors using a sector-based approach. This could mean working together with developing countries to identify technology solutions or emissions benchmarks applicable to each of several large industry sectors and applying those rules to the industry sector in each country to determine equivalent targets. In our paper, "The Sectoral Pledge Approach," (found at www.ccap.org/international/Sector%20Proposal~4-pager.pdf), we suggest two ways to encourage developing country participation, including the following:

- Technology Finance and Assistance Program – This program would support 1) specific commitments for deployment of advanced technologies, 2) the development of small and medium-sized enterprises for assistance with technology implementation, 3) capacity building and 4) support for pilot and demonstration projects. Funds from the TFAP could also be used to leverage private sector investment by writing down cost and mitigating risk to levels that would ensure competitive returns for private investors.
- The ability to receive emissions reduction credits if they exceed the target.

In addition, reliance on a process that uses country-specific data for developing national targets can help build confidence that the resulting commitments will be achievable.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Stowell/Cinergy Corp

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Cinergy agrees that a global effort, especially one which includes key developing countries, is vital to the success of the world's climate change efforts. US leadership in this effort is crucial.

Having said that, our first step should be limited to creating the long term framework/program for a lower, long-term emissions path while advancing only a short distance ourselves down this path. In other words, we should create the most economically affordable mechanism to control GHG emissions and begin by taking the first, relatively low cost actions which would be induced in the early years of such a program.

The Safety Valve is a key component of ensuring we do not go too far in this effort without the participation and support of partners in China, India and other key developing countries. The Safety Valve allows the country to predetermine the level of our investment in climate mitigation as part of our good-faith effort. For example, the safety valve could be structured so that it increases to a level of $25/ton CO2 by 2025.[1] Provision could be made that this price (and the large investment program it would drive) would be delayed until other countries joined in efforts to control CO2.

[1] At that point, we should have successfully proven the feasibility of utility scale IGCC with carbon capture and sequestration -- $25/ton CO2 is the approximate price needed to make wide scale deployment of this technology desirable.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Stowell/Cinergy Corp

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

  CO2 limits based on carbon intensity per unit of GDP may be an acceptable metric. For those who equate any cap (even if based on carbon intensity) with limiting economic growth, the inclusion of a Safety Valve as in a US program would ensure economies could continue to grow as driven by economic fundamentals. A carbon constraint does not require a stalled economy.

  It is important to ensure that other nations know we recognize that, owing to different levels of carbon intensity and economic development, their emissions' path will be different from ours. CO2 emission will peak in these countries some years after they do in the US. Again, the absolute level of emissions in any single year is less critical than the fact that a country is on a path to longer term and larger reductions via some sort of a price signal attached to GHGs.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Stowell/Cinergy Corp

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

  Developing countries are increasingly growing concerned with environmental issues as rapid economic growth from industrialization brings with it some of the problems of air and water pollution. It may be possible to link with plant owners in these countries in such a way that US firms could provide the investment capital needed to reduce emissions in exchange for reductions certified as per international accounting standards (it isn't clear to us that these yet exist). This would provide the very important component of "where flexibility" that is often mentioned as a cost lowering mechanism activated by a market approach.

  More broadly, the best thing the United States can probably do in the long term to encourage developing country emission reductions is to participate in the development of a sound successor to the Kyoto Protocol that provides a meaningful role for key developing countries and provides them with an incentive to participate. A variety of international policy architectures have been proposed that could accomplish this, at least in theory.[2]

[2] See: Aldy, Joseph E., Scott Barrett, and Robert N. Stavins. "Thirteen Plus One: A Comparison of Global Climate Policy Architectures." *Climate Policy*, volume 3, number 4, 2003, pp. 373-397; and Stavins, Robert N. "Forging a More Effective Global Climate Treaty." *Environment* 46(2004), December, number 10, pp. 23-30.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Clean Air Task Force

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

CATF believes that effective technology transfer and collaboration is likely to be a far greater spur to multi-lateral cooperation than any number of "trigger" mechanisms placed in legislation. Put simply, the developing world will likely not engage in an aggressive greenhouse-friendly program unless and until low carbon technology to meet underlying development needs is available on favorable commercial terms on a far wider scale than is the case today.

CATF also believes that many if not most of the current UN and US multi-lateral schemes to effect low carbon technology transfer and development in this area are inadequate. Developing the appropriate multi-lateral and incentive scheme is beyond the scope of this paper. But it is likely, as with RD & D generally as mentioned in CATF's answer to Question 2, that the answer lies with many different and overlapping approaches rather than a single "silver bullet."

One obvious area of focus of such efforts, however, would involve US and/or OECD payment to demonstrate and monitor wide scale geologic carbon storage in the next 10-15 years in developing countries (as well as OECD countries) so that this option can be tested on a large scale operational basis.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Please begin your response HERE. (no page limit) Developing countries are too energy-poor to even debate imposing mandatory limits on carbon-based energy use. A better approach is the one being pursued by the Asia Pacific Partnership on Clean Development and Climate, also known as AP6. Members include Australia, China, India, Japan, South Korea, and the United States. Instead of setting mandatory limits on greenhouse gas emissions—something developing countries cannot do without dooming their peoples to perpetual poverty—the AP6 parties agreed to cooperate on the development and transfer of technologies that reduce air pollution, lower greenhouse gas intensity, and enhance energy security.

Although members describe AP6 as complementary to rather than competitive with the Kyoto Protocol, it will likely emerge as a competitor during the Protocol's second (post-2012) phase. AP6 countries produce almost 50 percent of the world's greenhouse gas emissions. They include the Kyoto host country (Japan), the two industrial nations opposed to Kyoto (the United States and Australia), and the two most populous Kyoto ratifying countries that refuse to accept mandatory limits on energy use (China and India). The AP6 approach, emphasizing voluntary action, emission goals set by each country, and technology development, is likely to draw more and more adherents as European Union and other industrial countries flail and fail to meet their phase I Kyoto commitments.

The London-based Institute for Public Policy Research (IPPR) analyzed European Environment Agency data and concluded that most EU countries are not on track to meet their Kyoto targets. Specifically, in its December 2005 *Traffic Lights* report, the IPPR found that:

- CO_2 emissions are rising in 13 of the 15 EU countries;
- 10 out of 15 EU countries "will fail" to meet their Kyoto targets "even with planned additional measures";
- Three others will fail unless "planned new policies are implemented"; and,
- Denmark, Ireland, Portugal, Spain, and Italy are projected to exceed their respective Kyoto emission reduction targets by 10 percent or more.

This is noteworthy, because unlike the United States, EU countries generally have low-to-negative population growth, stagnant economies, and punitive taxes on gasoline consumption.

A recent column in the *Guardian* ("Scientists say British greenhouse gas emissions now higher than in 1990," David Adam, environment correspondent, Friday March 10, 2006) reveals that even Britain is failing to meet its Kyoto target. This is big news, because it has long been

conventional wisdom that the UK's switch from coal- to gas-fired electricity following Margaret Thatcher's privatization of the electric power sector reduced Britain's CO_2 emissions by so much as to make compliance with Kyoto a cakewalk. If Britain will have trouble meeting its round one Kyoto obligations, what are the odds that other industrial countries can comply with even deeper cuts in round two?

More pertinently, if the Kyoto road is a dead end for relatively wealthy EU countries, why should energy-poor developing countries want to take even one step down that path?

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit) There are no good metrics available. Population growth, wealth, geography (whether a country is compact or spread out), natural resource endowments (for example, whether a country is rich or poor in coal), technological development, and economic structure (for example, whether services, agriculture, or manufacturing dominate) all affect overall greenhouse gas emissions and greenhouse gas intensity. Any attempt to weight these factors to arrive at a universal metric for comparing different countries is bound to be arbitrary.

Per capita emissions—the metric favored by "contraction and convergence" advocates—would bias inter-country comparisons against the United States. Given our level of wealth, we of course emit more CO_2 per capita than do people in, say, Argentina. Emissions intensity (tons of CO_2 per unit of GDP) is a better measure of environmental performance, but it may obscure important differences in natural resource endowments, industrial structure, and geography, putting the United States (and other developed countries) in a falsely negative light. For example, a coal-rich country like Australia with an extensive mining industry is bound to emit more tons of CO_2 per dollar of GDP than countries lacking large coal deposits or with little mining or heavy industry. A continent-sized nation like the United States is bound to use more transportation fuel per dollar of GDP than a small island nation like Japan. America's spaciousness also partly explains why Americans tend to live in bigger houses and own more appliances. Bigger houses and more appliances mean more energy use and emissions. To chide the United States for being more emissions intensive than Japan is tantamount to scolding the United States for being a big country. There is no "right" level of energy- or emissions-intensity for an economy as whole any more than there is a "right" level of labor- or capital-intensity.

Such metrics are more useful as rhetorical weapons than as analytic tools for informing policy decisions. About all one can safely say is that as nations grow in wealth and technological prowess, they tend to use less energy and emit less CO_2 per unit of output. This is the natural tendency of competitive markets, which constantly challenge firms to do more with less. Although Kyoto-style policies may reduce emissions intensity in the short run, the long-term impact is less clear. Carbon suppression has enormous potential to stifle economic activity and, thus, the technological progress that is both a cause and consequence of wealth creation.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation

Submitter's Name/Affiliation:
Dr. Blair Henry, President, Northwest Council on Climate Change

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

I respectfully suggest the United States design a model that other countries will want to participate in – either through incentives or through penalties.

Based on actual political experience to date, I believe it is highly imprudent and dangerous for the United States to make its participation conditional based upon the actions, or inactions, of others.

To say "I won't put the fire out in the baby's crib unless you help put out the fire out in the baby's crib" results in the state taking the child away from you.

Question 4. Developing Country Participation
Submitter's Name/Affiliation:
Dr. Blair Henry, President, Northwest Council on Climate Change

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

No reply.

Question 4. Developing Country Participation
Submitter's Name/Affiliation:
Dr. Blair Henry, President, Northwest Council on Climate Change

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

No reply.

Question 4. Developing Country Participation
Submitter's Name/Affiliation:
Dr. Blair Henry, President, Northwest Council on Climate Change

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

No reply.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Skiles W. Boyd/DTE Energy

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Ultimately, to address the climate change issue, all countries must be included. Without full participation, emission decreases in one country will be negated by emission increases in another. Every nation must participate in this effort at some level.

DTE Energy endorses the detailed comments submitted by the Edison Electric Institute.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ed Mongan, DuPont

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Go to View [Header and Footer] and fill in Name/Affiliation.

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Scroll down to see questions.

Begin a new page when answering a new question.

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Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ed Mongan, DuPont

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

It is evident that the major developing economies of India and China will be the main source of GHG emissions growth in the coming decades unless significant steps are taken to alter their path of energy production and consumption, which will require significant investment. It is also clear that those economies, just as the US, do not intend to adopt climate policies that would constitute competitive disadvantages for them.

Any US GHG reduction program should be developed in a manner that expressly encourages these two economies to begin to implement policies of their own. We can envision significant market opportunities for American companies in helping these nations slow the growth of and eventually reduce GHG emissions. Part of achieving this important goal will be recognizing that the timeframe for those nations may have to be different than for more developed economies (e.g. a longer period of slowing GHG growth before beginning absolute reductions) and constructing a system that would facilitate investment inflows to those nations where low cost GHG reductions opportunities (in growth or absolute terms) exist.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ed Mongan, DuPont

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Greenhouse gas emissions reductions per unit of economic output (or GHG intensity) may be a useful metric.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ed Mongan, DuPont

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ed Mongan, DuPont

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The concept of GHG intensity, or GHG emissions per unit of economic output, may be a useful tool for encouraging the participation of the developing economies, with intensity targets becoming more stringent over time to ease from a slow-growth to an absolute reduction program. In addition, a system that helps to encourage direct foreign investment into critical GHG emitting sectors of those economies, such as power generation, transportation and manufacturing would encourage participation.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William L. Fang, Edison Electric Institute

Please first read the Edison Electric Institute (EEI) discussion of General Topics.

In responding to and commenting on the questions raised in the White Paper, we are not necessarily either endorsing or opposing the concepts. Moreover, as discussed in our General Comments, it is difficult to comment on a comprehensive approach outside the context of a specific proposal and when key elements have not been addressed.

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

1. Need for comparable action

The White Paper properly highlights the need for a global effort to address GHGs, to ensure both that such efforts are effective and that the U.S. economy is not placed at a disadvantage. The White Paper goes on to note that "an important component of a U.S. program **could** be to encourage major trading partners and large emitters of greenhouse gases to take actions that are comparable to those in the U.S." (p. 14) (emphasis added). However, it should instead be stated that ensuring that U.S. actions are not more stringent than those of other countries – to ensure that the U.S. is not economically disadvantaged – **must** be a key component of any domestic program. Without comparable action by key competitors – both developed and developing – U.S. mandatory reduction efforts would adversely affect U.S. trade and industrial competitiveness while doing little to address overall GHG emissions. As has been widely

acknowledged, one of the most fundamental flaws of the Kyoto Protocol is that it includes no reduction commitments by key developing countries. Given that the combined CO_2 emissions from China and India are projected to surpass those of the U.S. by 2009 (see graphic 1 in the Appendix), it would be critical that key developing nations also take binding actions to reduce their emissions in order to ensure an effective global response.

2. Evaluation process

A process to evaluate efforts of other nations, in order to determine if modifications to a U.S. mandatory program should be made, raises a number of issues. Foremost, it would be important to ensure a comparability of actions among developed countries and other key emitting nations. For example, under the Protocol, the U.S. would face a total reduction of 30-35 percent from its projected emissions in 2008-2012 to meet its 7 percent below 1990 level target. On the other hand, the European Union (E.U.) only faces a 4-5 percent reduction effort from its projected emissions in 2008-2012 to meet its combined 8 percent below 1990 levels target due to the reunification of Germany (which brought a significant amount of reductions into the E.U. due to the collapse of the East Germany economy), and the U.K. "dash to gas" (in which the U.K. replaced its coal-burning power plants with natural gas-fired ones). Thus, there was a disparity of commitments under the Protocol, a mistake that should not be repeated. Even with these two special advantages, the E.U. is unlikely to meet its Protocol target (see graphic 3 in the Appendix), and the U.K. now finds itself running coal plants again due to the high cost of natural gas and dwindling North Sea supplies.

Other key developed countries subject to the Protocol, such as Canada and Japan, are also not projected to meet their targets, and as noted in response to Question 3, it is unclear if Canada will achieve its Protocol obligations or instead develop its own GHG program. Further, it is unclear what consequences will be suffered, if any, by these nations for failing to meet their targets. The compliance regime governing the Protocol is nonbinding, and it is doubtful that any future regime that Parties might commit themselves to would contain penalties for noncompliance with targets. In contrast, noncompliance under a U.S.-only program would result in financial and other consequences for entities that do not meet their targets, while their competitors in the E.U. could potentially face no such consequences for failure to meet their targets under the Protocol or future international regimes (although firms might independently face penalties under the E.U. emission trading system). These are also issues that would need to be addressed in assessing the comparability of actions.

3. Evaluation timing

The timing of such an evaluation should be dependent on the specific targets and timetables of the programs being pursued by major emitting nations. For example, the targets under the Protocol will expire in 2012, and a future regime has not yet been developed, leaving the rest of the world currently with no reduction targets beyond 2012. Future U.S. reviews should allow for adjustment of the target so that the U.S. does not get ahead of the efforts of its major trading partners and other countries.

4. Metrics for comparison

Regarding possible metrics for comparing efforts across nations, the use of the GHG-intensity metric would seem to be the most appropriate for comparing most advanced economies. As graphic 4 in the Appendix demonstrates, the U.S. has improved its GHG intensity significantly compared to almost all of its key developed country competitors. Only the U.K. edges the U.S. in reducing carbon intensity from 1993 to 2003, and that was largely because of the U.K.'s "dash to gas." The intensity metric would also allow for the continued growth of emissions, albeit at a slowing rate, which recognizes the expected significant growth in energy demand. Furthermore, absolute emission reductions are simply not achievable in the short term given the current global energy infrastructure. The focus on absolute emission reductions is a key flaw of the Protocol. It is possible that the development of clean coal and other advanced energy technologies, the construction of new nuclear energy plants and further expansion of renewable energy, if fully realized, could lead to absolute reductions in the long term. The use of an intensity approach is also alluded to in the seminal work by Wigley, Richels and Edmonds,[1] where they note that "pathways involving modest reductions below a BAU scenario in the early years followed by sharper reductions later on were found to be less expensive than those involving substantial reductions in the short term."

The Energy Policy Act of 2005 (EPAct 2005) contains, in Title XVI, a process for evaluating developing country actions that should be fully funded and implemented.

[1] T. Wigley, R. Richels & J. Edmonds, "Economic and environmental choices in the stabilization of atmospheric CO2 concentrations," Nature 242, Vol. 379 (Jan. 18, 1996).

The GHG- or carbon-intensity metric would appear to be much more suitable than absolute emission reductions to developing countries, who will undoubtedly experience a period of significant growth in energy demand and whose priority concerns are sustainable development as well as a cleaner environment and reduced GHG intensity and emissions. In addition, as with developed countries, absolute emission reductions are simply not achievable in the short term given the current energy infrastructure and expected economic growth in developing countries. Furthermore, intensity approaches could also yield significant reductions. In discussing near-term reductions that could be achieved by improving the intensity levels of developing countries compared to those in the developed countries, Bernstein, Montgomery and Tuladhar state that "such an improvement in China, India, Eastern Europe, and Russia would provide annual emission reductions two to three times as large as those to which the Annex B countries would be committed under the Kyoto Protocol in 2010."[2] They go on to note that "[c]arbon intensities are very high in large developing countries, relative to levels achieved in OECD countries, so that bringing carbon intensities down to OECD average can produce large reductions in carbon emissions." *Id*. at 26.

5. Incentives for developing country actions

The White Paper has requested thoughts on how to engage developing countries in the effort of reducing global emissions. Technology transfer to developing countries can achieve large near-term emission reductions by closing the gap in emissions intensity between developing and advanced economies. Foreign direct investment is the most effective vehicle for technology transfer, so it is critical to focus engagement on facilitating technology transfer by improving the

[2] P. Bernstein, D. Montgomery & S. Tuladhar, "Potential For Reducing Carbon Emissions from Non-Annex B Countries through Changes in Technology" 1 (Sept. 2005).

investment climate in developing countries. This would involve using such mechanisms as the Asia-Pacific Partnership on Clean Development and Climate (AP6) to develop jointly beneficial proposals to: 1) remove obstacles to investment, such as subsidized pricing of energy, lack of protection of intellectual property, and excessive bureaucracy and corruption in developing countries, and 2) create incentives for U.S. companies to use their best technology and increase their level of investment in developing countries. These points are discussed in more detail in the paper, "Impact of Economic Liberalization on GHG Emission Trends in India," by W. Montgomery and S. Tuladhar (Climate Policy Center, May 2005).

One possible way to encourage GHG reductions by developing countries is through the recently inaugurated AP6, which involves key developed and developing country GHG emitters. The AP6 seeks to reduce emissions through improved efficiencies and market-based opportunities. The power sector is firmly committed to supporting this initiative, and is preparing to engage in a number of programs in response. Ultimately, the best way to ensure actions by all nations is to develop the zero- and less-emitting climate technologies needed to produce the energy that the world demands, and let the markets disseminate those technologies. As with the developing country evaluation process, EPAct 2005 contains a number of provisions addressing the development of these technologies, and these provisions also should be fully funded and implemented. In fact, EPAct 2005 outlines the type of strategy and funding levels that will need to be pursued under any U.S. program to ensure the development of zero and less GHG-emitting energy technologies.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Environmental Defense

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Environmental Defense

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Climate change is a global environmental problem that requires action by all major emitting countries. Participation by all key emitters is critical for two reasons. First, only with a global effort will it be possible to make sufficient progress to address the potential effects of climate change. Second, without greenhouse gas mitigation efforts by all major emitters, including our largest trading partners, the U.S. economy could be placed at a competitive disadvantage in some sectors. Thus, an important component of a U.S. program could be to encourage major trading partners and large emitters of greenhouse gases to take actions that are comparable to those in the U.S. As noted above, some key developed countries, such as those in the European Union, are already implementing emissions trading programs. Other countries have developed efficiency standards and additional policies that reduce energy use and greenhouse gas emissions.

However, the raw fact remains that it is probably in the U.S. interest to allow its business sector to gain early experience and a technological head start in developing and applying the low-carbon technological and business practices of the future. The Congress should not be averse to enacting a modest GHG limit system in the U.S. that would be closed to other countries until they adopted similar measures. The overall net benefit of such a step to the U.S. economy would probably be positive.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Environmental Defense

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

To answer this question, one must begin with a prior question, namely, what metrics are most valuable for determining whether human societies are achieving the objective of averting dangerous, irreversible climate change a "central goal" to which President Bush has affirmed America's commitment? The best metrics for that determination are: (a) atmospheric concentrations of greenhouse gases (if they are still increasing at the same rate 20 years hence, we will have failed ourselves, our children, and our grandchildren); and (b) absolute (total) emissions, whose growth must slow, stop, and reverse globally, if we are to achieve the objective.

Other metrics, such as emissions "intensity" (emissions per dollar GDP), mask any determination of whether human societies are achieving the objective of averting dangerous irreversible climate change. Intensity may decline while total emissions increase dramatically. The challenge of climate policy is to put in place policy frameworks that break the link between GDP and GHG – that encourage GDP to increase while driving GHG down. China, for example, has already reduced its intensity far more aggressively than the U.S. has, yet its total emissions have risen faster than U.S. emissions have. Climate change is a problem of total tons of greenhouse gases going into the atmosphere, and progress on intensity, while important, cannot solve the problem.

Starting from the premise that total emissions is the most important metric for ascertaining whether nations are succeeding in their mitigation efforts, a metric for comparison *between the United States and another industrialized nation* might include whether (to paraphrase the GATT), there has been an arbitrary or unjustifiable refusal to undertake absolute emission reductions by a nation (or regional or other grouping of nations) where the same or similar conditions prevail.

Continuing the GATT paraphrasing, a metric for comparison *between the United States and a developing nation* might be whether there has been an arbitrary or unjustifiable refusal to undertake absolute emission reductions by a nation (or regional or other grouping of nations) the economy of which supports significantly lower standards of living than does the United States. Further, the baseline for determining whether such nations are refusing to undertake absolute emission reductions could be calculated taking into account the fact that, other things being equal, a time period might elapse over which they might, on reasonable macroeconomic forecasts, be expected to "catch up" to the United States in terms of standards of living (as was essentially done in the highly successful 1987 Montreal Protocol on the Ozone Layer, negotiated by then-Secretary of State George Shultz).

Regrettably, given the narrow time window for emission cuts if nations are to avert dangerous climate change, offering a long time-lag for developing nations risks jeopardizing that goal. However, putting comparability into practice via emissions trading system linkage could deliver

powerful incentives for *near-term* comparable action in other nations. For example, Congress could decide that it would link a domestic emissions cap and trade system with cap and trade systems in developing nations where the level of their absolute cap is set at (or even slightly above) a reasonable forecast of business-as-usual emissions for such nations – provided such nations adopt the caps within 5 or 10 years. By offering an emissions "premium" to nations that move swiftly to adopt absolute caps on emissions, the United States could significantly spur investments aimed at ensuring that those nations follow a climate-friendlier development path. A variation on this basic approach could be used to encourage immediate efforts at large-scale forest protection in developing nations, where deforestation constitutes the single largest emitting sector in the developing world.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Environmental Defense

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

The primary question for evaluation is whether other nations are also slowing, stopping, and reversing their growth in GHG emissions. The evaluation should take place every three years.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Environmental Defense

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

As noted above, the strongest incentive would be to offer those nations the possibility of linking with a U.S. cap and trade system, if they adopt absolute emissions caps.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Richels & Wilson/EPRI

If a key element of the proposed U.S. system is to 'encourage comparable action by other nations that are major trading partners and key contributors to global emissions,' should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The sequencing of country participation is both a strategic decision and one of equity. However, it is clear that the stabilization of emissions, much less atmospheric concentrations, cannot occur without substantial participation by developing countries.

International negotiations aimed at stabilizing atmospheric carbon dioxide levels have focused mainly on near-term actions in developed countries. However, developing countries need to play a significant role because: 1) developing countries will account for the major share of anthropogenic emissions over the current century, 2) developing countries provide opportunities for cost-effective emission reductions, and 3) exclusion of developing countries can result in significant migration of carbon-intensive industries to developing countries and, hence, can dilute the efforts of developed countries.

In 1990, countries of the Organization of Economic Cooperation (OECD), the former Soviet Union, and Central and Eastern Europe accounted for about two-thirds of anthropogenic emissions. Under the Kyoto Protocol, these countries (referred to as Annex I) are called upon to adopt emission constraints for the early decades of the 21st century. As shown in Figure A4-1 in Appendix 4,[1] developed countries cannot deal with climate change alone.[2] Over the present century, developing countries will take on an increasingly larger share of carbon emissions due to population growth and economic development.

Even if Annex I countries agreed to completely eliminate their emissions, developing countries would have to make substantial reductions in order to stabilize atmospheric CO2 concentrations. The extent of the reductions depends on the selected atmospheric stabilization level.

Question 3 explored the value of "where" flexibility – allowing emission reductions to take place where it is cheapest to do so regardless of their geographical location. Figure A4-2 shows

[1] Studies typically present quantities of CO2 in either "tons of CO2" or in "tonnes (metric tons) of carbon". Our responses present results in the same units as the source material from which they are drawn. To convert from tonnes of carbon to tons of CO2, multiply by about four (e.g., global emissions of 6 billion tonnes of carbon are equivalent to 24 billion tons of CO2). Conversely, to convert $/tonne of C to $/ton of CO2, you divide by four (e.g., $240/tonne C is roughly equivalent to $60/ton of CO2).

[2] Manne, A. and R. Richels, 1997: Toward the stabilization of CO2 concentrations – Cost-effective emission reduction strategies. Presented at the *IPCC Asia-Pacific Workshop on Integrated Assessment Models*, United Nations University, Tokyo, Japan, March 10-12.

the marginal costs of emission reductions under one allocation of global emission rights.[3] Here, developing country emissions are allowed some room for growth before they must enter into a reduction program. Relative to the average for Annex I countries, the marginal costs for developing countries included in the analysis are substantially lower. Reductions in China, for example, could be achieved at one-fourth the cost of reductions in Annex I countries.

"Spillover" effects involve the location of carbon intensive industries. A constraint on Annex I emissions will reduce their competitiveness in the international marketplace. Studies reviewed by the IPCC suggest that there will be some industrial relocation offshore, with non-Annex I countries benefiting at the expense of Annex I countries. According to the IPCC, leakage can occur along a number of channels, including:

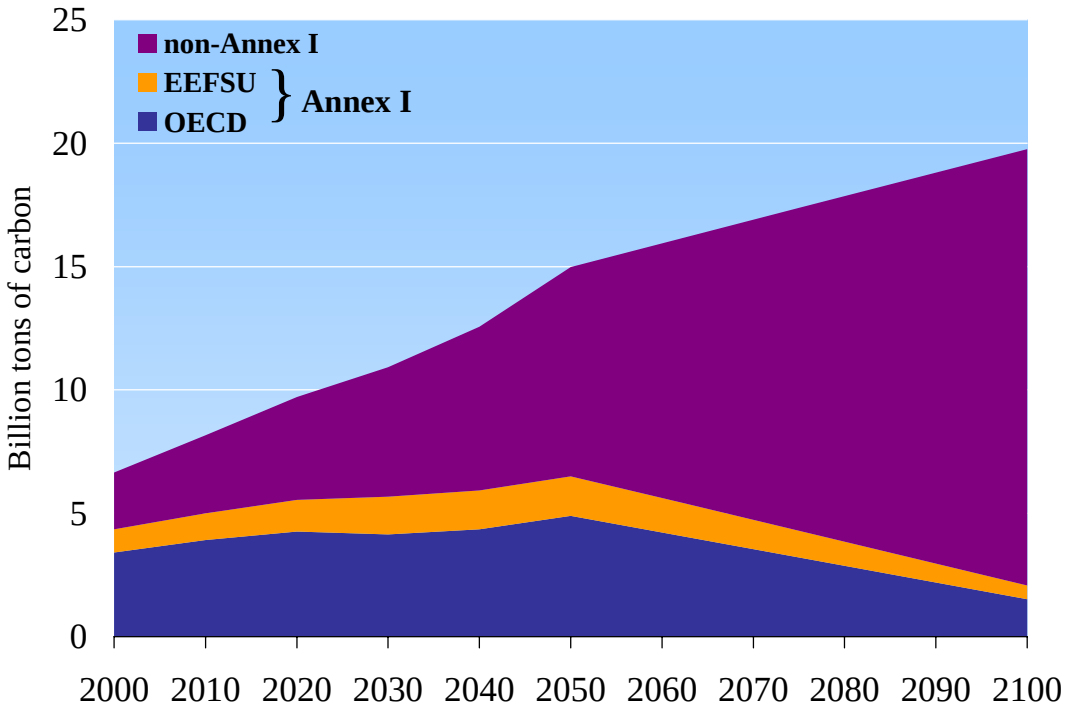
- The relocation of the production of energy-intensive products to non-abating regions.
- Energy market effects, including increased energy consumption in non-abating regions and interfuel substitution between fuels of differing carbon contents, due to the differential decline in fossil fuel prices in response to reduced demand in abating regions.
- Changes in regional incomes (and thus energy demand) due to terms of trade changes.

Estimates of the magnitude of the leakage problem vary, however, it should be noted that the IPCC finds a potential for substantial dilution of abatement efforts in developed countries by non-abating countries – in some cases exceeding 70%.[4]

[3] Montgomery, W.D., 1996: Differentiation of national circumstances and options for future commitments. Presentation to the Ad Hoc Group on the Berlin Mandate (AGBM 5), Geneva, Switzerland, December 11.

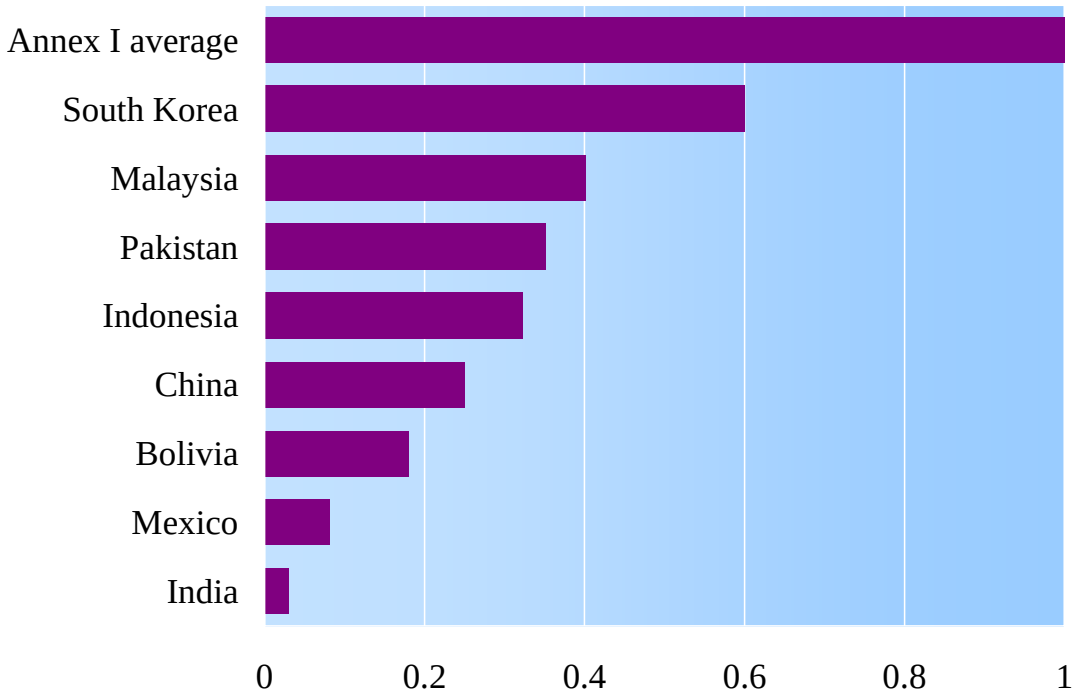
[4] IPCC (Intergovernmental Panel on Climate Change), 1996: *Climate Change 1995 – Economic and Social Dimensions of Climate Change*. Cambridge University Press, UK.

Figure A4-1. Projected carbon emissions in the developed "Annex I" countries (OECD and EEFSU – Eastern Europe and the former Soviet Union) and developing, non-Annex I countries (China and the rest of the world) in the absence of CO2 limitations.



Source: Manne, A. and R. Richels, 1997: Toward the stabilization of CO2 concentrations – Cost-effective emission reduction strategies. Presented at the *IPCC Asia-Pacific Workshop on Integrated Assessment Models*, United Nations University, Tokyo, Japan, March 10-12.

Figure A4-2. Relative marginal costs of emission reductions in different countries.



Source: Montgomery, W.D., 1996: Differentiation of national circumstances and options for future commitments. Presentation to the Ad Hoc Group on the Berlin Mandate (AGBM 5), Geneva, Switzerland, December 11.

Question 4. Developing Country Participation
John W. Rowe/Exelon Corporation

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Exelon agrees with the National Commission on Energy Policy recommendation that it would be prudent for Congress to articulate in any climate change legislation a process by which the U.S. will periodically review the status of its program against the status of programs in other key nations and consider whether adjustments to the U.S. program should be made to slow, or advance, the pace of the U.S. program. However, the timing of these reviews needs to be balanced against the industry's desire for regulatory certainty. Further, any adjustment in the pace of GHG reduction must provide for some level of international leadership by the U.S.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Participation by all key emitters, in all industries, in all countries contributing to global greenhouse gas emissions, is crucial to positively impact any effect on the climate. Appropriate studies and modeling should be conducted to determine the level of equivalent actions required from other nations. Developing countries are expected to contribute a significant share of anthropogenic emissions therefore, it is essential that major developing nations take serious action in reducing their emissions in order to impact emission reductions globally. Any program must adequately ensure that costly reductions made in developed countries would not be negated by increased emissions in developing countries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

In order to be comprehensive, it would be necessary to estimate total energy consumed in all sectors. Efficiency of each sector could potentially be measured by the following:

Industry	Metric
Electric Utility	Tons CO_2/MWH
	Heat Rates of Fossil-fired sources
Transportation	Miles/Gallon
	Gallons consumed/vehicle

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Any evaluation process should ultimately examine actual, verified reductions by other nations so that potential U.S. action is not ongoing without a commitment from other countries. Program evaluation, for example, could at a minimum provide a review by 2012 to align with other efforts, such as the Kyoto Protocol.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Stimulating and supporting technology deployment should be a key goal in developing countries. Incentives for deployment of more efficient technology in developing countries are likely to be the most cost-effective GHG control strategy. Technology development is the most likely cost-effective use of U.S. resources which can support and enhance the effectiveness of technologies deployed in developing countries. A system of incentives could be designed where developed countries could share technological improvements with developing countries to receive credit for reducing total world-wide emissions.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

- It is important for major developing countries to participate in GHG emission reduction, and the NCEP plan represents one approach to achieving that objective. Other options could include incorporating commitments into the trading integration agreements signed by the United States. For instance, agreements signed by the United States could include provisions making the agreement contingent on the utilization of cleaner, more efficient coal technologies for future coal-fired power plants. Another approach would be to authorize entities in sectors subject to a mandatory program in the United States to comply with some proportion of their requirements through offsets in developing countries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

Clarifying Question 4a:

What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

- The most useful metrics would be the countries' percentage change in GHG emissions – both in absolute terms and relative to changes in their GDPs.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

Clarifying Question 4c:

Are there additional incentives that can be adopted to encourage developing country emission reductions?

- The following incentives would facilitate the early deployment of low and zero-emission technologies, and therefore encourage overall developing country emission reductions:

1. Special, highly focused commercial advocacy for U.S. exports of GHG emission reduction equipment and services, as well as U.S. Government programs and financing.

2. U.S. Government-sponsored trade missions, conferences and other programs to bring together buyers and sellers of GHG reducing technology. The U.S. Government goal for these events should be to ensure that importers and exporters understand the available technologies and all existing programs, including financing, to encourage their use.

3. Utilize available research funding to support customization of technologies for developing countries. For instance, programs for the gasification of coals could include a program for the gasification of Indian coals.

4. Utilize available U.S. financing, particularly mixed credit programs (USAID grants combined with US EXIM loan guarantees) to support transactions, including in situations where U.S. firms are competing against foreign tied aid. When foreign firms are allowed to build flagship demonstration projects, they will be best positioned for future projects in that country or region. (Note that the U.S. Trade Promotion Coordinating Committee has called for greater use of mixed credits, but this has not been consummated, even where foreign tied aid has been demonstrated.)

5. Starting with the most significant GHG emitters, conduct a country-by-country inventory of policies (including U.S. policy) that act as barriers to the application of emission-reducing technologies, and develop proposals to remove those barriers. This should include action to remove all tariffs on energy efficient and renewable power generation equipment, as well as other trade barriers to emission-reducing equipment.

6. Examine the potential to create trade preferences among countries that apply environmentally friendly technologies.

7. Create value for carbon. This is the most important way to make a difference in the application of GHG emissions technology. Giving a value to those reductions will change the economics of thousands of private sector decisions, altering those

decisions in favor of GHG emission reducing technologies. The two key elements of giving value to the carbon emission reductions are to *create a property right* in the reductions and to *create demand* for the ownership of those property rights. The Clean Development Mechanism (CDM) offers a model for creating emission reduction credits, which could be made a property right, albeit a model whose process is too slow and cumbersome. Ways to create demand for those units could include --

- Allowing companies to make some or all of their payments to governments – e.g., concession fees, customs tariffs, offset requirements, and other taxes -- with the new units. (This would require the governments involved to set a price for the new units or to create some other price-setting mechanism.)

- Negotiating contracts between private companies and governments in which the private company commits to reduce its GHG emissions by a certain percent, including the potential for achieving reductions through the purchase and ownership of these new units. These contracts would be entered into voluntarily, and would then be binding on the two parties once concluded. Such contracts would have to include clear and meaningful enforceable penalties for failure to comply with reduction commitments.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Coequyt / Greenpeace

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

It is essential that the United States become a leader in the effort to slow climate change. The United States can do this by coming to the international table with strong goals that are consistent with the European Union goal of limiting global warming to 2oC. A clear commitment for the mid and longer term is necessary to assure the European Union, Japan and other Annex I countries that their actions under the Kyoto Protocol will be met by comparable American action and to broaden the international effort to developing nations. Whatever position one takes in relation to the Bush Administration position on international climate change, it is clear that the USA needs to rebuild its credibility as a reliable, science driven partner on climate change.

The best way to ensure that American actions encourage comparable efforts is to negotiate such agreements within the UNFCCC and Kyoto Protocol system. The United States should rejoin this system as soon as possible during the second commitment period of the Kyoto Protocol, which starts in 2013.

It is also important to show the world that the United States understands its responsibility to tackle global warming. While it is true that the impact of developing nations is growing relative to developed nations, it is important to recognize that the historic contribution from developed nations is much larger. It is also important to recognize that developing countries are taking strong action already to decarbonize their economies. China, for example, is reducing global warming gasses at a rate of four percent per year relative to its economic growth, a rate that is more than double that of the United States.

It would be a major mistake for the United States to set a target that allows significant growth in the production of global warming gasses, and expect that action to produce anything positive beyond our borders. If the United States were to create a trading system that is not consistent with the targets set for the Annex I countries under the Kyoto Protocol, it will more likely erode international commitments to address climate change than galvanize any country to take significant action.

Furthermore, there is a necessary linkage between the level of emission reduction undertaken by developed countries and the level of action to be undertaken by developing countries seeking to reduce the growth in their emissions. The United States and other developed countries need to ensure that they are adopting no regrets measures as a matter or priority.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Coequyt / Greenpeace

The United States could take a lead in developing the architecture of new instruments under the Kyoto Protocol for the period beyond 2012, which would be critical to drawing in the large emitters in the developing world. A domestic trading system, with its demand for credits, would be a powerful attractor, if coupled with the kinds of ideas mentioned above.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Coequyt / Greenpeace

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Equity and fairness must be central elements of any viable framework for international action. No single answer exists to the question of what is an equitable and fair system. It is clear though that several factors need to be taken into account in an international climate protection regime that can meet these objectives, including emission per capita, emissions per GDP, capacity to act, ability to pay and historical contribution. Yet, no single measure, not even relative per capita emissions, can provide the sole basis for this, although any equitable and fair system needs to give prominent weight to this factor.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Coequyt / Greenpeace

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

The best and only formal international machinery for evaluation and negotiation of international efforts to limit global warming exists under the UNFCCC and its Kyoto Protocol. The UNFCCC provides the only system for international negotiation of commitments to reduce global warming gasses. This process needs to be built upon as it is trusted almost universally as a process by which countries commitments can be considered fairly. The next round of international negotiations, which is just beginning, will need to develop a methodology for evaluating each nation's efforts for the next five year period.

It is appropriate the commitment be reviewed five yearly as in the five-year commitment periods of the Kyoto Protocol.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: John Coequyt / Greenpeace

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The United States could consider encouraging the development of new market mechanisms such as sectoral targets (eg power sector) with a no lose target architecture that would provide for credits to be sold into an international market once a target. Another idea that has merit are Sustainable Development Policies and Measures which could also be set up so as to generate credits for the international carbon market. The Flexible Mechanisms of the Kyoto Protocol provide important incentives for action in the developing world. In the first commitment period of the Kyoto Protocol (2008 – 2012), billions of dollars will flow through the CDM alone. This flow of money for carbon reduction projects will have a powerful impact in developing countries. In addition, a share of the proceeds generated by the Flexible Mechanisms will go into a fund that will pay for measures to alleviate climate change impacts in developing countries, further promoting cooperation by developing nations.

There is no reason that the United States could not create additional incentives through existing bilateral agreements or in other international talks. There are also promising discussions going on internationally about new creative ways to facilitate developing country involvement. The United States could contribute actively to this process if it were to come to the table with a global warming plan that is consistent with the efforts of the world's developed countries.

It is also important to remember that the United States has existing obligations under Article 6 of the Framework Convention. These obligations include financial and technological support of developing country carbon intensity reduction efforts.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Kevin Fay, ICCP

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Increasing atmospheric concentrations of greenhouse gases are a global concern that require a global response to address. Based on that belief, the US system should be part of a global system.

Geographically isolated systems driven by unilateral action impact the competitiveness of the specific geography and often result in unintended consequences, with the potential to impact trade, domestic employment, competitiveness of industry, and desirability of future investment. The European Union's stand alone Emission Trading Scheme (ETS) offers a clear illustration of these dynamics. Implementation of the ETS in a highly regulated energy market has had the unintended consequence of creating a loophole for power producers to pass on high, hypothetical CO_2 costs (opportunity costs) to consumers leading to lost competitiveness and even shutdowns within some industries, such as the aluminum industry.

Administrative burdens, higher electricity prices, and an over-reliance on natural gas that has resulted in rising gas prices have resulted in significant cost increases for the European petrochemical industry, with no material impact on the global GHG emissions balance. In the end, much production capacity could simply move to lower cost energy regions where GHGs are not yet regulated.

Given the global nature of the problem, any US cap-and-trade system should at a minimum be connected with other market-based emissions reduction systems. A stand-alone system will hurt the US economy. Ideally, the US needs to be an integral part of the post-2012 discussion to come to an effective global system. Without this connection to a truly global solution, regulated countries run the risk of deindustrialization.

If such a truly global system existed, then trading between countries and regions is an absolute must. If the global system remains a patchwork of regulated and non-regulated countries, then it is not likely that inter-region trading will have meaningful effect on the global GHG balance. However, if a truly global system is not realized, then at the very least those systems that operate need to be connected to create a large playing field that will allow market mechanisms to be most efficient, and that will make the biggest positive difference to the environment.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Kevin Fay, ICCP

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

The most obvious metric for comparing developed and developing country mitigation efforts is GHG intensity, which is the best metric for measuring the effectiveness of GHG mitigation efforts in a growing economy.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Kevin Fay, ICCP

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

The reporting requirements for developing countries could prove to be quite burdensome and are more likely than not going to be borne by the US or other developed country interests. It would be helpful to work with outside institutions, such as World Resources Institute or other non-governmental entities to assist in performing these functions. To minimize costs, these evaluations should occur no more frequently than biannually.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Industrial Energy Consumers of America

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Mandatory actions lead to more market distortions and un-necessary costs.

The focus should be on global technology transfer where there is a win-win solution, not on a global ghg trading system. Unless a country has designed an energy mix that is cost effective and less carbon intensive, implementing a developed country ghg trading system will not have the desired results. It will have many undesirable results as the Europeans are finding out.

The most cost effective way to reduce ghg emissions is through the development and transfer of technology. For example, simply transferring "existing" technology to developing countries would have an incredible impact on existing and future ghg emissions. Most of the developing world's electricity generation and manufacturing capacity uses technology that is 30 to 40 years old.

Major developing countries have expressed publicly no desire to cap their emissions. Many developing countries people do not have electricity which is essential for quality of life and economic development. Capping ghgs may deny them this needed supply of electricity.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Industrial Energy Consumers of America

Clarifying Question 4a:

- **What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?**

GHG intensity per GDP is the most meaningful measurement.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Industrial Energy Consumers of America

Clarifying Question 4b:

- **What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?**

The UNFCCC already has a process in place.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Industrial Energy Consumers of America

Clarifying Question 4c:

- **Are there additional incentives that can be adopted to encourage developing country emission reductions?**

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Ian Carter/IETA

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The white paper acknowledges climate change requires action by all major emitting countries and a global effort. It notes without greenhouse gas mitigation efforts by all major trading partners, the US economy could be placed at a competitive disadvantage. It asks how comparable actions could be encouraged and what metrics and process should be used to evaluate the efforts of other nations.

IETA believes the strongest available mechanism to encourage comparable actions is through linkage of a US emissions trading system to worldwide systems.

In moving forward it must be also recognized that a GHG market would be a pure regulatory market and that some regulatory certainty must be provided to potential participants, especially liquidity providers. Any review process should take place within clearly defined time frames that permit a reasonable horizon for investment decisions.

Question 4. Developing Country Participation March 13, 2006
Submitter's Name/Affiliation: Lisa Beal/Interstate Natural Gas Association of America (INGAA)

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The Interstate Natural Gas Association of America (INGAA), the trade association of the interstate natural gas pipeline industry, submits these comments in response to the Senate Energy and Natural Resources Committee February 2, 2006 White Paper on design of a mandatory greenhouse gas regulatory system.

INGAA views on this topic are summarized in the attached set of principles adopted by its Board in December 2005. INGAA does not believe that legislation mandating control of greenhouse gas emissions from the natural gas pipeline sector is necessary or warranted. The pipeline industry's contribution to overall US emissions is small. In 1990, the natural gas sector accounted for approximately 2.8% of overall US emissions. By 2003, that number had dropped to approximately 2.4%. Emissions from natural gas pipelines are only are part of this already small contribution. We expect this trend in efficiencies to continue -- for business reasons, INGAA member companies strive for continuous improvements in efficiencies that typically result in reductions of greenhouse gas emissions.

INGAA prefers and would support voluntary rather than mandatory measures to reduce greenhouse gas emissions. However, if legislation mandating reductions is deemed necessary, it should not regulate service providers such as transporters of natural gas or other fuels. Such legislation would be akin to attempting to regulate CO_2 emissions from coal by regulating railroads.

INGAA believes that linkage with comparable action by other nations, including developing nations, is critical to the success of a global GHG mitigation strategy. We support global efforts to address climate change through technology initiatives such as Methane to Markets and the Asia-Pacific initiative.

Question 4. Developing Country Participation March 13, 2006
Submitter's Name/Affiliation: Lisa Beal/Interstate Natural Gas Association of America (INGAA)

INGAA BOARD CLIMATE CHANGE PRINCIPLES
12/13/05

INGAA is a non-profit trade association representing virtually all interstate natural gas transmission pipeline companies operating in the United States and interprovincial pipelines operating in Canada. INGAA's U.S. members operate over 200,000 miles of pipeline and related facilities and account for over 90 percent of all natural gas transported and sold in interstate commerce.

The causes and effects of climate change continue to be debated within the scientific community. Yet there is growing concern that increasing levels of greenhouse gases in the atmosphere may affect the earth's climate. Many in the international community and some states have taken regulatory action, which has resulted in a variety of local, state and regional responses, as well as increased policy debate at the national level.

INGAA does not believe that legislation mandating control of greenhouse gas emissions from the natural gas pipeline sector is necessary or warranted. The pipeline industry's contribution to overall US emissions is small. In 1990, the natural gas sector accounted for approximately 2.8% of overall US emissions. By 2003, that number had dropped to approximately 2.4%. We expect this trend in efficiencies to continue -- for business reasons, INGAA member companies strive for continuous improvements in efficiencies which typically result in reductions of greenhouse gas emissions.

INGAA prefers and would support voluntary measures to reduce greenhouse gas emissions. However, if legislation mandating reductions is deemed necessary, INGAA urges lawmakers to ensure that climate change legislation:

1. Provides for a consistent national approach which is preferred to redundant and potentially conflicting state or regional initiatives;
2. Does not harm the economy or cause undue burden to the natural gas pipeline industry and its customers;
3. Recognizes that the use of natural gas should be part of any climate change policy;
4. Relies on market-based approaches that are simple to administer and provide clear goals which allow industry to determine specific solutions;
5. Recognizes that if a mandatory allowance trading program is developed, the point of regulation, and consequent responsibility for possession and surrender of any allowances should not be placed upon service providers such as transporting pipelines;
6. Ensures that early efforts to reduce GHG emissions are recognized and rewarded;
7. Supports research and development and appropriate funding for technology development to reduce greenhouse gas emissions, including those from our facilities;
8. Recognizes and does not compromise the existing regulatory structure at the Federal Energy Regulatory Commission; and
9. Encourages the U.S. EPA and other Agencies to adopt policies consistent with any such national approach.

Carla R. York, CEO, Innovation Drive
112 Cameron Station Boulevard, Alexandria, Virginia 22304
703-931-1410

4.) If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan be part of a mandatory market-based program? If so, how?

Global action is desired and required to reduce GGE significantly and to realize desired results for the United States and other countries around the world. However, regardless of U.S. initiatives and successes, certain countries may or may not follow our lead due to increased expense of GGE reduction technology itself or simply alternative energy sources are deemed too expensive an option.

Specifically, the Chinese have recently returned to coal-fired power plants because natural gas plants, which they briefly had preferred, became too expensive to power.

However, in the case of public transit, hydrogen buses may be manufactured in China or other foreign countries to encourage the adoption of hydrogen transit technology in Asia. It will also minimize labor costs to enhance affordability across the globe. In that light, transit vehicles shipped back to America and other nations should be exempt from duties and tariffs to preserve the affordability of fleet replacement and acquisition costs, especially over the next ten years.

Aggregated, free trade for GGE friendly vehicles will significantly reduce acquisition costs and thereby foster more rapid integration of the alternative technology vehicles in the United States and other countries.

4. If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

RESPONSE: It is important to work in concert with one's key trading partners and the major emitters on the matter (as e.g. under the Asia-Pacific work and the follow-up to the Glenn Eagles summit of the G8). It is likely most effective to invest in research into carbon-less energy production quickly deploy it in the US and transfer such technologies to developing economies that otherwise will shortly become the major emitters.

The failure to include all economies will almost certainly guarantee failure of overall goals, as is the case with Kyoto now. For example should Canada reach its overall annual goal of CO_2 reduction, it will roughly equal the monthly increase of CO_2 emissions from China over the same period. Reductions of in the US could also quickly be overcome by additions to CO_2 emissions in developing economies.

We believe that establishing a cap and trade program in the US would require an examination of future US trade policy. It might be necessary to incorporate adjustable import quotas and or tariffs into any reduction model. A shift of the production of consumer goods to economies without caps will not reduce emissions. It will simply shift emissions at the expense of the domestic economy. However that discussion will be complex and require a review of existing trade law. It is essential that the Committee examine the trade impacts of any anticipated cap and trade system, and have an open discussion with domestic manufacturers before moving forward.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Please begin your response HERE. (no page limit)

China is the obvious one here and it is important to bring them into the fold. I dont know how you might do that but it is important.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit)

Emissions per unit of GDP; decline in emissions intensity over time; comparison of emissions intensity with that of other countries with similar GDP/capita.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Same answer at 4a

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Negative incentives: countervailing tariffs on carbon content of goods coming into country if country does not adopt some steps.

Positive incentive: access to export subsidies on abatement and sequestration technologies.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: LEE LANE – CLIMATE POLICY CENTER

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

This question is extremely important. Including emissions caused by land use changes, the LDCs' annual GHG emissions already exceed those of industrialized countries. (METI 27) LDC emissions are growing far more rapidly than are those of the OECD countries. Indeed, it is impossible to stabilize atmospheric greenhouse gas concentrations at acceptable levels without constraining LDC emissions. (Yang and Jacoby 1997, 4) And the greatest opportunities to reduce the growth in greenhouse gas emissions at relatively low cost are concentrated in countries like China and India.

The realism of expecting such participation is, however, questionable. China, India, and the other 'threshold economies' give a much higher priority economic development than they do to reducing greenhouse gas emissions. Moreover, for such countries, economic development may be the best protection from climate change. It diminishes their economic dependency on the vulnerable agricultural, forestry, and fisheries sectors. It provides wealth needed for large scale investments in adaptation. And it can be undertaken independently of the vagaries of vastly complicated international agreements.

Some have argued that the US, by adopting GHG controls, would set an example that would induce China and India to do likewise. In a negative sense, this claim contains an element of truth. As long as the US refuses to adopt controls, China and India will certainly not do so.

The reverse, however, is unlikely to follow. American adherence to Kyoto or unilateral adoption of domestic GHG controls would not create an incentive for China and India to implement GHG limits. US controls on GHG limits would create a competitive boost for China and India vis a vis the US. Implementing Chinese or Indian controls would cancel this competitive advantage. Moreover, for India and China, GHG limits would harm them competitively vis-à-vis other LDCs. US controls, therefore, would not eliminate the economic incentives for China, and India to continue to resist GHG limits.

The NCEP legislation proposes one way to create such an incentive. It links (albeit too weakly) the escalation of the US safety valve price to reciprocal climate policy measures by China and India. At a minimum, linkage could prevent a purposeless unilateral escalation of US control costs. Without cooperation from the threshold economies, safety valve price escalation would be doomed to futility. Its impact on climate change would be trivial. But economic harm would grow as the safety valve escalated.

Unfortunately, the NCEP provision is too weak. Currently, the provision calls for the safety valve to go on escalating unless Congress acts affirmatively to halt it. But future promises may be distracted or impeded by other business. Years of competitive harm could pass before relief was provided.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: LEE LANE – CLIMATE POLICY CENTER

A remedy is readily available. The safety valve needs a fail safe system. With such an arrangement, the escalation of the safety valve price would stop automatically unless the President affirmatively certified to the Congress that China and India and other threshold economies had responded to the US control policies. An adequate response would be the implementation of a comparable policy. Absent such certification, the safety valve price escalation would stop. It would not resume until the certification of an appropriate response by China and India. Certification reports would be due at five year intervals.

Strengthen the NCEP provision. the standing offer to increase US efforts if those efforts are reciprocated would help to dispel the impression that the US is the sole holdout against international emission limits.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: LEE LANE – CLIMATE POLICY CENTER

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Two standards measure national level of climate policy effort. One standard is the marginal cost of abatement. Marginal abatement cost will be visible as a carbon tax rate, an allowance safety valve price, or an auction price. The second metric is national expenditures on climate-related R&D.

In practice many difficulties would arise. Some abatement policies are likely to be sector specific. R&D expenditures may vary greatly in quality and effectiveness. It might be difficult to compare these two areas of effort.

Nevertheless, these two standards cover the two activities that are likely to determine climate policy success. Some version of them is likely to be a reasonable approximation of level of effort. Perhaps the best approach would be to rely on an expert assessment looking at both areas.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: LEE LANE – CLIMATE POLICY CENTER

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The so-called threshold countries (China, India and others) are clearly hoping to be paid to mitigate their GHG emissions. Many European climate policy advocates are proposing that the second phase of the Kyoto process re-engage the US on terms that would require this country, for several decades, to shoulder the lion's share of the costs of paying for GHG abatement in China and India as well as paying for draconian domestic emission reductions.

Clearly, shifting abatement costs to the US would remove the major Chinese and Indian objection to abatement. Quite possibly, it is the only policy that could do so. At some point these countries' national priorities might shift in a way that would increase their receptivity to climate change mitigation. Yet such a change may lie decades in the future.

Theoretically, for the US, paying China and India to adopt abatement incentives has appeal. The marginal cost of abatement in China and India is far below that in the US. The US would receive more for its abatement dollar by concentrating its efforts there than it would receive by concentrating its efforts at home. Again, however, practical problems abound.

First, many institutional problems prohibit the Chinese and Indian governments from adopting efficient GHG limitation policies. Their economies contain huge non-market components where economic incentives would be ineffectual. These societies are not fully subject to the rule of law. Government political legitimacy may be insufficient to impose unpopular energy price increases. Receiving transfer payments from the US would presumably help these governments buy political support. But transfer payments may not translate into the rule of law. And governments plagued by corruption may not be able to deliver payments to the intended beneficiaries.

Second, should the US government initiate income transfers designed in part to bolster the political legitimacy and taxing power of the government of the Peoples' Republic of China? To be sure, such transfers would occur under the cloak of the benign cause of mitigating climate change. Still, as a policy this would raise larger concerns.

Third, William Nordhaus has recently pointed out that international cap-and-trade programs are especially vulnerable to chicanery. Both the seller of foreign GHG emission allowances and the buyer profit from a generous interpretation of the validity of the emission reductions on which the allowance is supposedly based. This incentive pattern raises a risk of abuse even where the rule of law is unchallenged and enforcement institutions are powerful and well funded. Nordhaus recommends the use of carbon taxes rather than cap-and-trade. He is probably right. But both the Chinese and the Indian governments already experience difficulty with levying and collecting taxes.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: LEE LANE – CLIMATE POLICY CENTER

Fourth, the proposed international income transfers do not solve the enforcement problem. They merely postpone it. Initially, threshold countries receive net subsidies rather than incurring net costs. Eventually, however, threshold country emission control costs would begin exceeding the transfer payments. At that point, nothing prevents the formerly threshold country from abrogating controls.

Two economists associated with CPC, Scott Barrett and Thomas Schelling, have written extensively about the problem of encouraging developing countries to participate in GHG control schemes. It is noteworthy that both have concluded that prospects are poor at least for a long time. If they are correct, a fail safe limit on cap-and-trade is essential.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: Eric P. Loewen, Ph.D. / Personal Response
Former Congressional Fellow for Senator Chuck Hagel
Systems Integration Manager, Lead-Cooled Fast Reactor System, Idaho National Laboratory

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Brief Response: Involvement by <u>all</u> nations is desirable – necessary - for reduction of GHG in our world's atmosphere. The Energy Policy Act of 2005 addresses this by encouraging technology development by other nations.

I have responded to the Key / Clarifying Questions (below).

All responses are my personal response and are not affiliated with the Idaho National Laboratory.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: Eric P. Loewen, Ph.D. / Personal Response
Former Congressional Fellow for Senator Chuck Hagel
Systems Integration Manager, Lead-Cooled Fast Reactor System, Idaho National Laboratory

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Response: "Global emissions" must first be defined in absolute mechanical (scientific) terms. Only absolute mechanical measure can compare GHG activity.

More scientific measure should be required. Current "climate science" techniques of reading tree rings and interpreting history statements are imprecise. The Congress could do well to establish a Climate Data Registry.

For a metric, Senator Hagel developed a GHG intensity formula that can be used to establish allocations across the spectrum of GHG emitters. This formula provides an understandable, fair, measurable metric for allocating (and recognizing) GHG reduction quotas/goals.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: Eric P. Loewen, Ph.D. / Personal Response
Former Congressional Fellow for Senator Chuck Hagel
Systems Integration Manager, Lead-Cooled Fast Reactor System, Idaho National Laboratory

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Response: Mechanical measure of GHG emission reduction is the only practical, realistic, and unequivocal evaluator of GHG reduction. This provides both a realistic yardstick of progress (or lack thereof) and an indicator of dedication to GHG reduction. Such measure should be taken annually.

The evaluation (measure) can be a straight-forward mechanical measure. Measurement devices and processes can be automated. This can provide consistent and unequivocal records for evaluation and trending.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: Eric P. Loewen, Ph.D. / Personal Response
Former Congressional Fellow for Senator Chuck Hagel
Systems Integration Manager, Lead-Cooled Fast Reactor System, Idaho National Laboratory

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Response: Economic incentivization is universally recognized and sought after. The esoteric "feel good" phrases in award citations and flowery "mission statements" will not motivate governments to enforce the necessary activities to reduce GHG emissions.

Rather than pile on more "encouragement," pursue and implement the Title XIV incentives of the Energy Policy Act of 2005 for foreign technology development.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Michael MacCracken/Climate Institute

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

All nations need to act. Even if all of the developing nations went to zero emissions tomorrow, the projected emissions of the developed nations would, by the end of the 21st century, be causing unacceptable, even dangerous, anthropogenic interference with the climate system. Conversely, if the developed nations went to zero emissions tomorrow, the ongoing legacy of their past emissions plus the projected emissions of the developing nations would, by the end of the 21st century, be causing unacceptable, even dangerous, anthropogenic interference with the climate system. Developed and developing nations are in this boat together and there is no sense for either waiting for the other to begin to act.

Right now, the legacy of climate change from past emissions by the developing nations is quite small (because much of their emissions has been short-lived soot and methane) whereas the developed nations have a large legacy from the large historic CO_2 emissions, hidden in part by ongoing sulfate emissions. Thus, in addition to ethical reasons, there is very good reason for the developed nations to aggressively move to reduce their emissions, showing that nations indeed can have a high standard of living while not changing the climate at anywhere near the pace that is being created. If developed nations are able to move to very energy efficient technologies and alternative sources of energy, the developing nations will surely follow—they won't be able to afford energy inefficiency as their labor costs rise, and they won't be able to continue to use the dirtiest fuels as the levels of pollution that they experience rise. So, developing nations will have to move to modern technologies, reducing their emissions, and waiting to force them to agree to exactly when and by how much is simply unproductive—the developed nations, and particularly the US, need to take the lead and change ourselves over the next several decades for there to be any chance that the world can avoid very serious climate change (and glacial melting). The developed nations need to thus pioneer the approaches and technologies that will help the developing world to follow our example within a few decades (note that their shift to energy prices based on world market values has already led to a very strong influence to keep their emissions from rising—this has been much more effort than the US has yet exerted). Especially in that a sectoral based permit system, if done correctly (as I believe I have proposed) will not let developing countries have a further economic advantage, the developed nations, particularly the US, simply needs to get started and the developing nations will surely have to follow.

With respect to the other developed countries, the difference the US has with them is that our population is growing and theirs (i.e., Europe's) is not. It was the prospect of the US having to reduce per capita emissions by about a third while Europe would have to reduce per capita emissions by only several percent that made the Kyoto Protocol not workable for the US by the time that President Bush was in power. An earlier start, extensive sequestration, borrowing from the future, and purchase of credits from Russia might have made the cutbacks achievable—but not after sequestration was largely excluded, permit purchase was limited, and the stock market

crashed). So, we need a strategy that will emphasize the creative advantage of the US, the larger land area, and the wide range of energy supply and use options open to the US because its energy use has been so relatively extravagant.

I believe a national program and national leadership in the US will indicate that we can make the changes at lower cost than our competitors, so they will be hurrying to catch up with us. But, we must get started or we will face very significant climate change.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Michael MacCracken/Climate Institute

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Metrics of comparison other than emissions are really not the issue—if we in the US worry about all holding hands and just doing as little as every other country, the climate will change in ways that will very adversely affect us all. We need to be running ahead and showing what can be done, and they will all surely need to follow to keep up with how much our economy can improve once we stop exporting hundreds of billions for foreign oil and wasting so much of the energy that we are using. As the 1992 NAS report made clear, the US could use roughly 30% less energy if it were using the best available technologies—and this estimate was based on implementing only advances with a payoff time of 3 years or less, and without the advantage of new technologies and approaches developed in the last ten years. The US simply needs to get moving in the right direction, not worry about exactly what developing nations are doing—if we start running, they will surely follow.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Please begin your response HERE. (no page limit)

We have long held the view that any mandatory program limiting the use of fossil fuel energy would do more harm than good and is inconsistent with the actual state of scientific knowledge about our climate system and human influence on it. It would also be inconsistent with the wealth of economic analyses on the effects of limiting energy use. In particular, we believe that the Sense of the Senate Resolution is not an accurate statement of scientific fact or political reality.

The goals of the Resolution are to slow, stop and reverse the growth of emissions "at a rate and in a manner" that will not harm the US economy and which will encourage "comparable actions by other nations that are major trading partners and key contributors to global emissions". Fossil fuels, which provide over 80% of the energy used in the United States, maintain our standard of living and promote robust economic growth. That also is the level used globally, and the International Energy Agency projects that fossil energy will still represent over 80% of the world's energy use in 2025.

We also observe that there is no credible basis for assuming that major developing countries like China and India would adopt a mandatory program to reduce their emissions. China has been unambiguous in their rejection of any mandatory emission control program. The contribution of emissions from the US and major developed countries is declining and projected to continue to decline. Not many years ago, developed nations accounted for 60% of carbon dioxide emissions. In not so many years that will be the level produced by developing countries.

There are only two ways to reduce greenhouse gas emissions—use less fossil fuel or develop technologies to use energy more efficiently, to capture emissions or substitute for fossil energy.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

There is an abundance of economic literature demonstrating the relationship between energy use and economic growth as well as the impacts of curtailing energy use. Long-term, new technologies offer the most promise for affecting emission rates and atmospheric concentration levels. In the interim, actions to reduce the growth in emissions should focus on where such actions are the most cost-effective. Title XI of the recent energy bill does that.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Craig Montesano/National Mining Association

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Mandatory systems will do nothing to encourage carbon reductions by the nations that will account for the greatest percentage of emissions increases over the next 50 years. In addition, the National Mining Association sees evidence of a trend among nations to look beyond the Kyoto Protocol. When fully matured, these new approaches will result in a more economically and technologically dynamic framework for greenhouse gas reduction. Thus, the NCEP plan, from a practical standpoint, is irrelevant to the ongoing international discussions. Currently, the United States, China, India, and the other nations of the Asia-Pacific Partnership on Clean Development and Climate are working in accord across several industry sectors on efforts that take into account both the economic realities and opportunities of the future. The sharing of technology, innovation and best practices will, in these countries' view, lead the way to effective emissions policies.

Similarly, the recent United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) Meeting in Montreal ended with an agreement recognizing the "diversity of approaches" and "essential role of technology" in reducing emissions. Even while the mechanics of the Kyoto Protocol were being discussed, member nations opened the door to what happens after the protocol's first commitment period ends in 2012, resolving the following:

- Long-term cooperative action to address climate change, including advancing development goals, sustainability, adaptation, technology and market-based opportunities.

- The dialogue will be non-binding and will not open any negotiations leading to new commitments.

- Explore ways to promote access by developing countries to climate-friendly technologies.

Earlier in 2005, the G8 nations, in a summit meeting in Gleneagles, Scotland, demonstrated a willingness to consider climate change in ways far removed from Kyoto's mandatory approach. In a policy document issued concurrently with a main communiqué, the G8 leaders agreed that "[t]ackling climate change and promoting clean technologies, while pursuing energy security and sustainable development, will require a global concerted effort over a sustained period." As such, they agreed to a general framework for action to:

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Craig Montesano/National Mining Association

> (a) Promote innovation, energy efficiency and conservation, improve policy, regulatory and financing frameworks; and accelerate deployment of cleaner technologies, particularly lower-emitting technologies.
>
> (b) Work with developing countries to enhance private investment and transfer of technologies, taking into account their own energy needs and priorities.
>
> (c) Raise awareness of climate change and our other multiple challenges, and the means of dealing with them and make available the information that business and consumers need to make better use of energy and reduce emissions.

Given the massive energy and economic impact of China and India, both the G8 and COP-11 statements are not surprising. Among the tremendous infrastructure pressures the Chinese and Indian governments will face include, energy consumption and security, reduction of poverty with an overall increase in the quality of life, and economic competitiveness. According to the U.S. Department of Energy (DOE), the world as a whole will see economic growth of 3 percent annually over the next 20 years, while developing Asian will see economic expansion at a rate of 5.1 percent. To fuel its economic growth, the International Energy Agency (IEA) estimates overall demand for energy in China and India will approximately double by 2030, whereas U.S. demand is expected to grow by 35 to 50 percent.

As China and India accelerate their consumption of fossil fuels, so to will their emissions of greenhouse gases, such as carbon dioxide, increase. Based on EIA data, India and China currently contribute 4 percent and 14 percent, respectively, to total global carbon dioxide emissions. However, these figures are projected to increase to 5 percent and 18 percent by 2025, roughly equaling that of the United States. This represents a 3.3 percent annual average increase by China over the next 20 years, and a 2.9 percent increase for India, compared to a 1.5 percent increase for the United States.

According to DOE, coal will continue to dominate the energy markets of both India and China, accounting for 51 percent and 64 percent, respectively, of total energy consumption in both countries. While the share of coal in total energy production is expected to decline, coal will still account for 41 percent of energy produced in India and 56 percent in China by 2025. These two countries alone account for 67 percent of the total expected increase in coal use worldwide.

Emissions of pollutants in the Southeast Asian region, due to inefficient practices, have also spawned a particular problem dubbed the "Asian Brown Cloud." According to preliminary findings of a recent UN report, this discovery "is clear evidence of the magnitude of the aerosol pollution problem. Three dimensional aerosol-assimilation models reveal this haze to extend over South, Southeast and East Asia." Furthermore, "[t]he affected region is the most densely populated in the world characterized by a monsoon climate, high levels of pollution, and increasing problems of water stress, agricultural productivity and health."

Population growth in China and India underscores these issues. By far the greatest population increase will occur in India, which is projected to see an addition of approximately 489 million

people by mid-century, for a total of 1.6 billion. China's population is estimated to increase by 77 million for a total of 1.4 billion.

As a senior DOE official remarked, "[W]e cannot simply blame China, India and other developing nations for seeking the same levels of affluence that our citizens enjoy." Trying to persuade developing nations to limit productivity and their ability to provide their citizens with economic security will prove to be fruitless. On the other hand, the recently concluded Asia Pacific Partnership on Clean Development and Climate (AP6) is designed to encourage the use of efficiencies and technologies that improve the economic well being of all, while reducing pollution and the rate of greenhouse gas emissions growth in the regions of the world where emissions growth is the most rapid.

The Australian Bureau of Agricultural and Resource Economics (ABARE) completed an analysis of the effects of the AP6 on economic growth and pollution reduction in the six partner countries. ABARE concluded that, "The contribution of partnership economies to global population, wealth and energy consumption is such that actions undertaken by these economies on technological solutions alone could lead to a curbing of global emissions relative to what would otherwise have occurred."

ABARE estimates that, as a result of the partnership, by 2050 emissions of sulfur dioxide and nitrogen oxide will be nearly 25 percent lower in China and 20 percent lower in India than would be the case without actions taken by the eight industrial sectors targeted for partnership action. The use of petroleum in China and India will be nearly 25 percent lower and global emissions of greenhouse gases will be 11 percent lower by 2050 than would be the case without implementation of AP6. As sectors are added to the original eight key industry sectors: clean fossil energy use; power production; coal mining; steel; cement; aluminum; renewable and distributed energy and buildings; and appliances, emissions reductions will go even lower.

The AP6 is an example of a technology based voluntary program that is intended to have results. Such programs should be extended to involve other nations as well, offering a better way to reduce emissions while supporting poverty reduction and strong economic growth.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: National Environmental Trust

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The National Commission on Energy Policy report, *Ending the Energy Stalemate,* provides that if "major U.S. trading partners and competitors (including Canada, Europe, Japan, Russia, and such developing countries as China, India, Mexico and Brazil) fail to implement comparable emission-control programs," then further carbon reduction activities by the U.S. should be halted. Conversely, "if considerations warrant more aggressive U.S. action, Congress should strengthen program requirements."

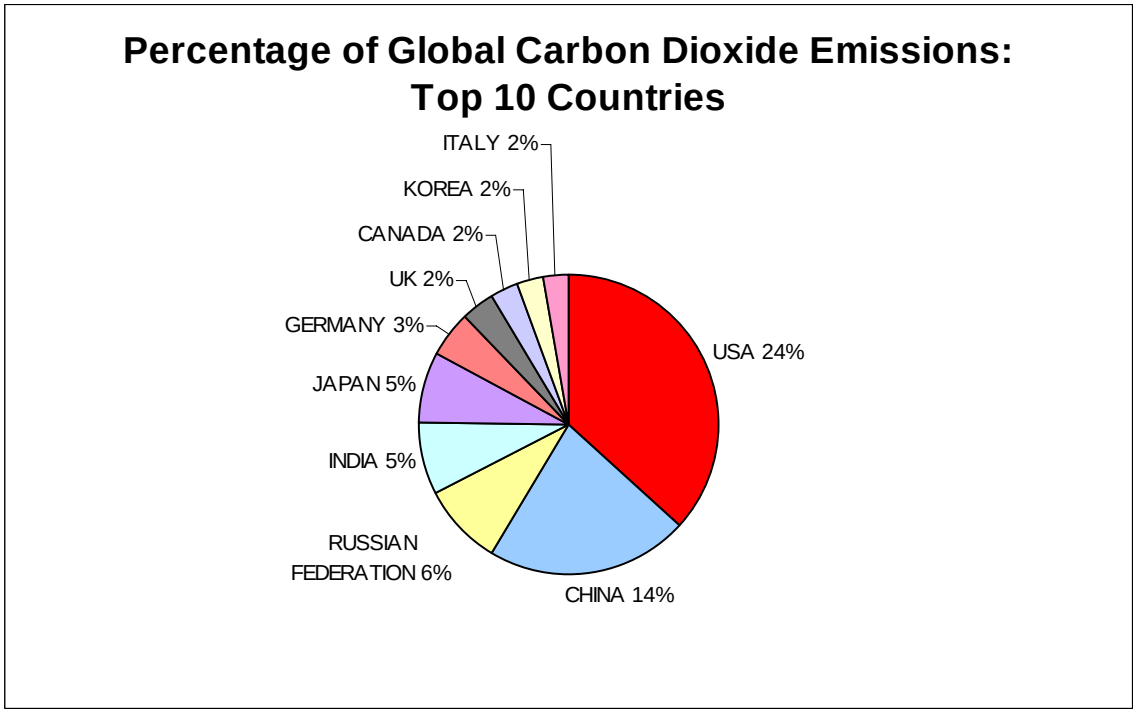
The crux of the above design concept is that if the U.S. adopts some type of initial program then the U.S. should not take additional measures that will promote our economy, national security, competitiveness and environmental quality unless, and until, China, India, Mexico and Brazil are taking such measures in tandem with us. There are many problems with such an approach.

First, it is important to examine the inaccurate underlying assumption that less developed or rapidly industrializing nations have yet to make meaningful progress towards address global warming. In reality, many countries have now outpaced the United States in adopting policies and measures to improve energy efficiency, enhance energy security, develop alternative fuels, reduce deforestation, promote cleaner-burning energy production and reduce net greenhouse gas releases. In fact, while U.S. emissions continue to rise (now about 16% above 1990 levels), emissions in China have dropped more than 17% since 1997.

A 2002 report by the Pew Center on Global Climate Change found that the combined efforts of Brazil, China, India, Mexico, South Africa and Turkey resulted in a 19% decline in greenhouse gas emissions. Brazil's aggressive biofuels and energy efficiency programs cut their greenhouse gas emissions by 10%. And, Brazil has more aggressively and successfully worked to reduce deforestation within its borders, reportedly curbing Amazon forest loss by nearly one-half in 2005.[1] New Chinese fuel economy standards are more stringent than those in the United States, Australia and Canada; plus, China has reduced its emissions growth by one-third over the past 30 years through slower population growth, energy efficiency improvements, switching from coal to natural gas and afforestation. India's renewable energy programs and tightened enforcement on existing clean air regulations have reduced its emissions growth over the last decade. Mexico has reduced annual emissions growth by 5 percent over the last ten years by beginning to curb deforestation, switching to natural gas and saving energy. [2,3]

[1] U.S.A Today, "Brazil: Amazon destruction down sharply," August 28, 2005.
[2] Pew Center on Global Climate Change, *Climate Change Mitigation in Developing Countries: Brazil, China, India, Mexico, South Africa, and Turkey,* October 2002.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: National Environmental Trust



Source: U.S. DOE 2002

Another fundamental problem with the proposed design concept is that it is premised on the notion that efforts to reduce our GHG emissions will wreck our economy. However, there are many studies that show we can reduce greenhouse gas pollution to levels called for in the Kyoto agreement without harming the U.S. economy.[4] The facts show that over the medium term, developing country emissions threaten neither the effectiveness of the treaty nor the competitiveness of the United States.

Responsibility for the problem of climate change

An approach that ignores the cumulative contributions of developed countries to current greenhouse gas concentrations will delay agreement on cooperative actions to reduce emissions. Global climate change is driven by the accumulation of heat-trapping gases in the atmosphere over the past centuries. Most greenhouse gases are extremely persistent, and stay in the atmosphere for a hundred or more years before breaking down. The industrialized countries, which harbor less than 25 percent of the world's population, are responsible for about 75 percent of the accumulated carbon dioxide emissions currently in the atmosphere. The U.S. alone is responsible for about a quarter of all greenhouse gas emissions worldwide. India, however, with over 1 billion people, is responsible for just over 5 percent, while China, the world's most populous country, accounts for about 14 percent. Now, and for many years to come, industrialized countries like the U.S. will continue to be the biggest source of the problem.

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[3] Pew Center on Global Climate Change, *Comparison of Passenger Vehicle Fuel Economy and GHG Emission Standards Around the World*, December 2004.
[4] See, for example: U.S. Department of Energy, *Scenarios of U.S. Carbon Reductions*, 1997; and Oak Ridge National Laboratory, *Scenarios for a Clean Energy Future*, 2000.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: National Environmental Trust

Fairness in responding to climate change

One-third of the world--approximately 2 billion people--has no access to electric power services. Another one-third of the world's population lacks reliable access to electric power and transport services. Most of the remainder of the world lives in industrialized countries and enjoys relatively high standards of living. These are the countries covered by the Kyoto agreement's first compliance period.

Carbon emissions from developed countries differ greatly in scale and character from those in most developing countries. For example, U.S. per capita CO2 emissions are 20 times those of the average Indian and more than 10 times those of the average Chinese person. In contrast to wealthier developed nations, carbon emissions from developing nations are primarily basic necessity emissions created by people trying to meet food and shelter needs.

U.S. competitiveness is furthered, not imperiled, by responsible climate policies

In 1998, the White House Council of Economic Advisors concluded that the costs of implementing the Kyoto Protocol would be "modest"—no more than a few tenths of 1 percent of gross domestic product in 2010. That would be equivalent to adding a month or two to a ten-year forecast for achieving a vastly increased level of wealth in this country.[5]

A subsequent and more detailed study by five Department of Energy national laboratories found that policies to promote increases in energy efficiency and use of renewable energy resources would allow the United States to make most of the emission reductions required to comply with the Kyoto Protocol through domestic measures that could save consumers money, ease our energy problems and actually improve economic performance over the long run.[6]

The costs associated with increasing energy efficiency, deploying a new generation of energy technologies and the other practical measures needed to reduce our GHG emissions pale in comparison to the adverse financial impacts that are threatened by unabated climate change. While climate science does not yet allow us to attribute specific storm occurrences and other severe weather events precisely to the buildup of GHG, the 2005 hurricane season provides a cautionary warning. Hurricanes Katrina and Rita are anticipated to inflict costs and economic losses well in excess of a $100 billion.[7] Recent studies predict an increase in stronger and longer-lasting U.S. hurricanes in a warmer world.

Specific emission reduction commitments by developing countries are not necessary to safeguard the competitiveness of U.S. industry.

More than 90% of U.S. industry would not face a significant increase in their production costs assuming a sensible policy to limit emissions that recycles the value of emission allowances back into the economy. "Recycled" allowance revenue could then be directed towards compensating economically vulnerable groups – such as severely affected industries, workers, communities or consumers – and reducing taxes on labor and capital. Also, for the small number of firms that

[5] Council of Economic Advisors, "The Kyoto Protocol and the President's Policies to Address Climate Change: Administration Economic Analysis," July 1998.
[6] Interlaboratory Working Group, "Scenarios for a Clean Energy Future," ORNL/CON-476, November 2000.
[7] Statement of Douglas Holtz-Eakin, Director, Congressional Budget Office, Macroeconomic and Budgetary Effects of Hurricanes Katrina and Rita, before the Committee on the Budget, U.S. House of Representatives, October 6, 2005. http://www.cbo.gov/showdoc.cfm?index=6684&sequence=0

would face significant cost increases (increases of more than 3%) competitiveness concerns can be addressed through border tax adjustments that can be adopted unilaterally by the United States under the rules of the World Trade Organization.[8]

The bottom line is clear: A U.S. system that establishes commitments necessary to meet Kyoto-level targets is needed to protect our economy and global competitiveness, preserve options to stabilize GHG at safe levels and to lay a foundation for action by all countries to take further steps to reduce greenhouse gas emissions. Given the U.S.'s historic leadership role in international affairs, our disproportionate role in current GHG concentrations and the urgent need for action, we should not adopt a "design concept" that hinders our ability to address the problem of global warming.

[8] *See* J. Andrew Hoerner, Burdens and Benefits of Environmental Tax Reform: An Analysis of Distribution by Industry, San Francisco: Redefining Progress (2000).

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Arline Seeger & Hunter Prillaman / National Lime Association)

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

It is essential that developing countries be included in international greenhouse gas programs. Emissions can only be effectively reduced if costs of reductions are distributed equitably to all portions of the world economy consuming fossil fuels. Developing countries should also share in the benefits of technology transfer and development.

The U.S. government has already taken important steps in this respect with the formation of the Asia-Pacific Partnership on Clean Development, in which the United States is joining with Australia, China, India, Japan, and South Korea to accelerate clean development, by promoting the development and deployment of existing and emerging cleaner, more efficient technologies and practices that will achieve practical results. Similar partnerships should be pursued with other countries.

Question 4. Developing Country Participation
Richard Rosenzweig/ Natsource LLC

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Natsource is not answering any of the key questions asked in this section. We have undertaken a significant amount of work for the National Commission on Energy Policy (NCEP) in their assessment of the efforts of both developed and developing and countries in addressing the climate issue and in developing their recommendations for a U.S. program.

Natsource developed a range of metrics to assess the performance of eight developed countries and four developing countries in addressing climate change. The metric focused on: (1) environmental performance; (2) efforts in developing a market based framework to reduce compliance costs; (3) efforts to deploy lower emitting technologies in the market place through a range of policies; and (4) to develop technologies that will be necessary to achieve the steeper reductions that will be required to achieve the long-term goal incorporated in the United Nations Framework Convention on Climate Change (UNFCCC) of stabilizing atmospheric concentrations of GHGs in the atmosphere.

Natsource scored these efforts through a qualitative and quantitative approach. We would be happy to share this work and communicate the results of it with the committee in its development and consideration of climate change policy.

Question 4. Developing Country Participation
Richard Rosenzweig/ Natsource LLC

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Richard Rosenzweig/ Natsource LLC

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Richard Rosenzweig/ Natsource LLC

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

THE QUESTION:

4. If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

OUR RESPONSE:

Leadership:
As children of God as well as citizens of the United States we yearn to see leadership from the United States. While there is much to be grateful for as individuals, congregations, mayors, states, and some businesses take steps to address global warming, we are dismayed by the lack of national leadership and will not be satisfied with future leadership that is predicated on contingencies.

We are not encouraged by the attitude of national leaders that our leadership on the issue of global warming is contingent on whether others will act first. We know global warming is real. We are more and more aware of the current and future impacts. We are more and more aware of the possible solutions and the opportunities they offer.

"How can we lead but not too much in case . . ." This seems to be at the heart of the question asked above. It seems to be a question born of fear of some possible outcomes. While leaders must understandably weigh the possible positive and negative outcomes of their actions, our faith, born out of the victory of life over death in the resurrection of our Lord Jesus Christ, reminds us to place ourselves squarely in the scale of hope and thus tip the balance against fear and dismay.

We propose the essence of the question should instead be:

"Who among the nations will genuinely lead?"

We suggest to you that the genuine leadership need should be grounded in hope.

We are also aware that genuine leadership – based on wisdom, compassion, and a hopeful vision of the future – is most needed when facing the most daunting challenges. We encourage you to consider the need for such national leadership and we support efforts to direct the United States to provide this type of hopeful leadership and action in addressing global warming.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The U.S. has an opportunity to "lead by example". Establishing a mandatory program to reduce GHG emissions in the U.S. can encourage other nations to take their own action. Leadership on our part can alter the international dynamics and improve the prospects for international cooperation.

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The Bingaman-Specter resolution was a major step towards resuming the U.S. leadership role on global warming. In the June 2005 resolution, a majority of the Senate dramatically emphasized that the U.S. needs to take a first step on its own in order to *encourage* comparable action by our trading partners and key developing countries. The resolution says that while our subsequent actions should be guided in part by the actions of other countries, we need to take the lead to encourage other countries to take comparable action.

NRDC has proposed, in answer to question 5, that the U.S. adopt a long-term declining cap to cut our emissions in half by 2050. Our answer to question 5 sets forth the basis for the proposed declining cap: it is aimed at keeping CO_2 concentrations from exceeding 450 ppm, and it is premised on the U.S. not exceeding a fifth of the cumulative global emissions budget that is compatible with that concentration target.

"Comparable action" should be defined as the actions needed from other countries, in concert with U.S. adoption of the proposed declining cap, to keep the world on the 450 ppm pathway. Staying on the 450 ppm pathway requires other developed countries to reduce emissions at similar rates. It also requires the key developing countries to reduce and ultimately reverse their own emissions growth.

U.S. leadership is critical. Other countries are unlikely to act on the necessary scale if the U.S. does not lead.

Nonetheless, it is important to recognize that other countries are *already* acting in advance of U.S. leadership. Nearly all other developed nations (with the exception of Australia) have ratified the Kyoto Protocol and bound themselves to meeting emissions targets that, considered as a whole, reduce emissions below 1990 levels. The EU, for example, is committed to an 8% reduction below 1990 levels for the years 2008 through 2012. Canada and Japan are committed to reduce emissions 6% below that level. Compliance with these commitments will be achieved by a mix of domestic measures and use of international trading mechanisms (both emissions trading and the Clean Development Mechanism).

We should also recognize that key developing countries are also *already* taking actions to reduce their global warming emissions growth. For example:

- China's GHG emission intensity has improved due to macro economic reforms and energy sector liberalization. China's Eleventh Five-Year Plan, which goes into effect this year, calls for a 20 percent reduction in energy use per unit of GDP by 2010. China's renewables sector

is the world's fastest growing, at more than 25 percent annually. China has enacted a new Renewable Energy Law and vowed to meet 15 percent of its energy needs with renewable energy by 2020.[1]

- China has far surpassed the U.S. fuel efficiency standards for vehicles of all classes. China's new fuel efficiency standards require vehicle classes to achieve on average 34.4 mpg by 2005 and 36.7 mpg by 2008 (normalized for the CAFE test cycle). American fuel efficiency standards are calculated using the average fuel use of the entire fleet sold by an automaker. However, in China, as well as Japan, the standards require that each model sold meet the criteria. China's Standardization Administration finalized fuel economy standards for light-duty vehicles—cars and light trucks, including sport utility vehicles (SUVs)—that are up to twenty percent more stringent than U.S. CAFE standards. The standards will save 60 million tons of carbon in 2030, displacing 517 million barrels of oil in that year—equivalent to removing 35 million cars from the road. China's leaders are serious about enforcing the standards—vehicles that don't meet the standards cannot be certified for sale or operation—and intend to broaden them to include heavy duty trucks.[2]

- Brazil's GHG emission intensity levels have risen in recent years because of increased gas use, which increases emissions relative to hydropower, on which Brazil has traditionally relied. However, in the transportation sector Brazil has saved 574 million tons of CO_2 since 1975 through its development of ethanol, which is roughly ten percent of Brazil's CO_2 emissions over that period.[3]

Even though they have already begun to act, other countries (both developed and developing) are likely to take U.S. action or inaction heavily into account in deciding on their future actions. Our leadership is fundamental.

[1] "Gov't demands more focus on green energy," *China Daily* (Jan. 13, 2006).
[2] An and Sauer, *Comparison of Passenger Vehicle Fuel Economy and GHG Emisson Standards Around the World*, Prepared for the Pew Center on Global Climate Change, December 2004
[3] Baumert, Herzog, and Pershing, *Navigating the Numbers: Greenhouse Gases and International Climate Change Agreements*, World Resources Institute 2005, ISBN: 1-56973-599-9

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

In general, NRDC believes the statutory criteria adopted now for "comparable action" should not be overly prescriptive. There is much to learn and work out as other countries react to a reassertion of American participation and leadership. These factors call for retaining flexibility to flesh out the concept of "comparable action" based on experience as it unfolds between now and the first review of the U.S. program.

Certain fundamentals can be set forth, however. For example, other developed countries should be expected to have emissions caps; these might be embodied in the Kyoto Protocol, a post-2012 world-wide agreement, or other instruments involving a smaller group of nations. Key developing countries – by which we mean those large enough to be significant contributors to global emissions – should be expected to have adopted national or sectoral policies to reduce emissions growth (either directly or through other measures, such as those that China has already undertaken).

NRDC believes that if the U.S. establishes the recommended long-term declining cap, there will be a substantial opportunity to negotiate near-term agreements from key developing countries on so-called "no lose" targets for at least some sectors, with linkages to international emissions trading mechanisms.

For example, a developing country might agree to a benchmark or target for reducing the rate of emissions growth in its electric generating sector. If emissions are below the benchmark or target, the country would have surplus emissions allowances to sell in emissions trading markets. This arrangement would open the door to new capital flows for cleaner energy development, and for attractive means of financing those projects in advance of making the emissions reductions. If the benchmark or target were exceeded, the country would not gain the capital flow from selling emissions allowances.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

See prior answer.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The primary need is for the U.S. to show leadership in reducing emissions and to re-engage in international fora, ranging from bilateral relationships to the multilateral UNFCCC/Kyoto framework. If the U.S. shows leadership, and if the U.S. structures its program properly (see answer to 4a), then strong market-based incentives will promote developing country emission reductions as a way to access new capital flows for sustainable development.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Whitman/NRECA)

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Less developed countries such as China and India that will experience the greatest growth in greenhouse gas emissions in coming years, have clearly stated that their priority is economic development over virtually everything else. These countries are also our greatest economic competitors. The premise here is that we can unilaterally establish a mandate to reduce US greenhouse gas emissions to our own industries' disadvantage, or assist less developed countries with sustainable economic development, again at our own industries' expense.

NRECA believes that a better solution is to promote sustainable economic development in these countries through partnerships such as the Asia-Pacific Partnership on Clean Development and Climate and Methane to Markets and harness America's ingenuity and premier science and technology infrastructure to develop the next generation of technologies so badly needed to address climate change. These technologies can be promoted through our international partnerships, resulting in expanding markets for US products. America's competitive advantage is in science and technology. What is required is a sustained national commitment to technology research, development, demonstration, and deployment.

Technology development and deployment are the keys to addressing global climate change. Short-term mandates that take the focus and resources away from technology development will ultimately impair and delay our ability to mitigate climate change. And they will hurt America's economic competitiveness in the global marketplace. Policies that encourage the acceleration of and investment in the development of new climate technologies and provide incentives for their early deployment should be the basis of US climate policy.

Question 4. Developing Country Participation
Submitter: Jim Frias, V.P. and Corporate Controller, Nucor Corporation

4. If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Nucor Corporation: Any mandatory legislation should include periodic review of the progress of other nations and should sunset in the absence of appropriate progress by those nations. As the Committee's hearings amply showed, the U.S. cannot effectively address greenhouse gases alone. As explained above in the case of steel, demand shift from U.S. production to developing nations can actually increase greenhouse gas emissions. Nucor believes that mandatory greenhouse gas controls make no sense without a mechanism for inducing developing nations to address GHG emissions.

Question 4. Developing Country Participation
Submitter: Jim Frias, V.P. and Corporate Controller, Nucor Corporation

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Nucor Corporation: The appropriate metric is greenhouse gas intensity per unit of output. An important point to note is on recycling. In the past, some have tried to argue that in calculating the greenhouse gas intensity of a manufacturing operation that recycles, the amount of greenhouse gases emitted should include the amount of greenhouse gases embedded in the original production of the scrap metal that was recycled. This approach would diminish the incentive to recycle and does not reflect the actual GHG emitted in the manufacturing operation that recycles. This kind of thinking should be rejected.

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Question 4. Developing Country Participation
Submitter: Jim Frias, V.P. and Corporate Controller, Nucor Corporation

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Nucor Corporation:

U.S. manufacturers are most vulnerable under a cap and trade carbon emissions control regime during the interim period when the U.S. has emissions controls but other major industrial producers, such as China, Russia, and India do not. Any system of greenhouse gas controls should ensure that the system does not encourage energy-intensive industries such as steel to relocate or shift product demand from the United States to countries that do not regulate greenhouse gas emissions.

One method for doing this would be to adopt a scheme that imposes additional charges for products that exceed baselines for greenhouse gas emissions on a unit product basis. For example, the United States could calculate the average level of greenhouse gas emissions for steel production in the United States on a per ton basis for individual products (hot-rolled sheet, steel beams, etc.) It could then impose an excise tax on *all* steel products, domestically produced and imported, that would vary according to the producer's greenhouse gas emissions intensity. Products manufactured by steel producers with greenhouse gas emissions intensity below a baseline level per ton (for example, 150% of the U.S. average) would not be subject to any tax. Those who exceeded the baseline by 0 – 10% would be subject to an excise tax of say, for example, 10% of the value of the product; 11 – 20% to an excise tax of 20%, etc., up to some maximum tax rate.

Such a system is feasible for steel because steel products are always identified by the producer. The system would require producers who wish to sell products in the United States to monitor and report on their emissions of GHG per ton of each product they produce. The report could go to either a central repository or simply appear on the mill certificate that accompanies each steel product. While the system would rely on self-monitoring and reporting, the accuracy of the reports could be tested by periodic testing by the U.S. Environment Protection Agency. Failure to report per ton emissions would result in the application of the maximum excise tax, as would false reporting of emissions.

Alternatively, recognizing that the Committee does not have jurisdiction over taxes, the system could be based on use of recycled material. Four of the five most energy intensive industries – steel, chemicals, aluminum, and pulp and paper – do recycle. In the case of the steel industry at least, the amount of recycled material used as a proportion of total raw materials may serve as a meaningful proxy for efficient energy use and comparatively low intensity GHG emissions. Rather than basing the excise tax directly on GHG, the system could base it on recycled materials used as a percentage of total raw materials. There would be no excise tax for producers using more recycled materials than the baseline percentage, and a graduated tax for those using less. Again, the system would require individual producers to monitor and report their use of recycled materials, with the ability of the United States to audit and verify these reports.

This system would require U.S. steel producers to calculate and report their per ton GHG emissions for a variety of products, and to agree to monitoring by the EPA. The same would be

true of any foreign steel producer who wished to sell its products in the United States. The monitoring of greenhouse gas emissions is not onerous, and reporting would represent little additional burden on U.S. or foreign producers.

Such a system would have two immediate benefits. First, it would employ price signals to encourage consumers to use steel that was produced with lower levels of greenhouse gas emissions. Second, the system would discourage producers from relocating production from the United States, Europe, or Canada (where steel producers have relatively low emissions intensity) to countries such as China, simply to escape greenhouse gas limits. Producers could of course relocate, but if the new facility had an emissions level intensity for a given product above the U.S. baseline, the product would be subject to the appropriate excise tax when sold in the United States.

Because this system would apply equally to domestically produced and imported products, it would be consistent with the WTO obligations of the United States. At the same time, the mechanism would offer a direct incentive for U.S. and foreign steel producers to reduce their greenhouse gas emissions to below baseline levels. As emissions fell, the baseline could be reduced to reflect improved technology, thereby serving as a constant source of encouragement for individual producers to continue to reduce emissions. It would also encourage other countries to adopt greenhouse gas programs, so that their producers would not be disadvantaged by the excise tax.

Question 4. Developing Country Participation
Submitter: Jim Frias, V.P. and Corporate Controller, Nucor Corporation

4. If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

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Question 4. Developing Country Participation
Submitter: Jim Frias, V.P. and Corporate Controller, Nucor Corporation

Clarifying Question 4a:

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Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Question 4. Developing Country Participation
Submitter: Jim Frias, V.P. and Corporate Controller, Nucor Corporation

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

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U.S. manufacturers are most vulnerable under a cap and trade carbon emissions control regime during the interim period when the U.S. has emissions controls but other major industrial producers, such as China, Russia, and India do not. Any system of greenhouse gas controls should ensure that the system does not encourage energy-intensive industries such as steel to relocate or shift product demand from the United States to countries that do not regulate greenhouse gas emissions.

One method for doing this would be to adopt a scheme that imposes additional charges for products that exceed baselines for greenhouse gas emissions on a unit product basis. For example, the United States could calculate the average level of greenhouse gas emissions for steel production in the United States on a per ton basis for individual products (hot-rolled sheet, steel beams, etc.) It could then impose an excise tax on *all* steel products, domestically produced and imported, that would vary according to the producer's greenhouse gas emissions intensity. Products manufactured by steel producers with greenhouse gas emissions intensity below a baseline level per ton (for example, 150% of the U.S. average) would not be subject to any tax. Those who exceeded the baseline by 0 – 10% would be subject to an excise tax of say, for example, 10% of the value of the product; 11 – 20% to an excise tax of 20%, etc., up to some maximum tax rate.

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true of any foreign steel producer who wished to sell its products in the United States. The monitoring of greenhouse gas emissions is not onerous, and reporting would represent little additional burden on U.S. or foreign producers.

Such a system would have two immediate benefits. First, it would employ price signals to encourage consumers to use steel that was produced with lower levels of greenhouse gas emissions. Second, the system would discourage producers from relocating production from the United States, Europe, or Canada (where steel producers have relatively low emissions intensity) to countries such as China, simply to escape greenhouse gas limits. Producers could of course relocate, but if the new facility had an emissions level intensity for a given product above the U.S. baseline, the product would be subject to the appropriate excise tax when sold in the United States.

Because this system would apply equally to domestically produced and imported products, it would be consistent with the WTO obligations of the United States. At the same time, the mechanism would offer a direct incentive for U.S. and foreign steel producers to reduce their greenhouse gas emissions to below baseline levels. As emissions fell, the baseline could be reduced to reflect improved technology, thereby serving as a constant source of encouragement for individual producers to continue to reduce emissions. It would also encourage other countries to adopt greenhouse gas programs, so that their producers would not be disadvantaged by the excise tax.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Pew Center Response

It is important to distinguish between two distinct but related policy objectives: 1) achieving adequate action by all major emitting countries, and 2) protecting U.S. firms against competitiveness impacts. Each requires a different set of policy approaches.

Ensuring that other countries act against climate change is important from a competitiveness standpoint. However, it is first and foremost an environmental imperative: without adequate action by all major emitters, the goal of climate protection cannot be met. Of steps the United States can take to encourage other nations to act, establishing a mandatory program to limit and reduce U.S. emissions may in and of itself be the most critical. Lack of action by the United States stands as the major impediment to stronger efforts by other countries. Demonstrating the will – and establishing the means – to reduce U.S. emissions will greatly alter the international political dynamic and improve prospects for international cooperation.

Making future U.S. action expressly contingent on the efforts of other countries may provide some further inducement for action. Alternatively, by appearing irresolute, it may deter others from commencing ambitious long-term efforts. A more effective means of achieving adequate and comparable effort by all major emitters would be the establishment of mutual commitments through multilateral negotiation and agreements. In the case of developing countries, this should include or be complemented by positive incentives, preferably through market mechanisms.

Ensuring that efforts are broadly comparable, however, will not necessarily achieve the second objective: protecting against competitiveness impacts. It is not the competitiveness of the U.S. economy as a whole that is at issue. Competitiveness at the national scale is largely a reflection of productivity, and the U.S. economy consistently ranks among the world's most competitive.[1] The cost of achieving mandatory GHG limits at the levels under consideration

[1] The United States ranked second only to Finland in the World Economic Forum's 2005-2006 Global Competitiveness Report. (World Economic Forum, *Global Competitiveness Report 2005-2006*. Available: http://www.weforum.org/site/homepublic.nsf/Content/Global+Competitiveness+Programme%5CGlobal+Competitiveness+Report)

would only marginally affect projected economic growth and is unlikely to affect overall competitiveness.[2]

To the degree there are competitiveness impacts, they would fall on specific sectors – energy-intensive industries whose goods are traded internationally, a relatively small segment of the U.S. economy.[3] However, these sectors could remain vulnerable even if efforts by all major emitters are broadly comparable because countries will choose to allocate effort differently.[4] For instance, a country may reduce overall emissions but exempt a given sector from controls, giving that sector an advantage over foreign competitors that are subject to controls. In that case, a review of comparability, unless undertaken sector by sector, offers little assurance against competitiveness impacts.

A full assessment of policy options for addressing competitiveness would require a more thorough analysis of the potential impacts on vulnerable sectors than is presently available. Generally, the impacts on a given sector or firm would depend on its specific competitive positioning and its ability to substitute and innovate. Most analyses of U.S. industry experience with past environmental regulation find little evidence of competitive harm. One comprehensive review – synthesizing dozens of studies across a range of U.S. regulations and sectors – concluded that while environmental standards may impose significant costs on regulated industries, they do not appreciably affect patterns of trade.[5] Some economic literature suggests that, to the contrary, innovation spurred by regulation may in fact confer a competitive advantage.[6]

In the design of a cap-and-trade system, the best way to protect broadly against competitiveness impacts is to set the caps at modest levels and minimize compliance costs by, for instance, allowing offsets and full banking of allowances. The choice of allocation approach also has implications. A free "grandfathering" of allowances based on historic emissions provides

[2] EIA projects that achieving the emission targets of the Climate Stewardship Act would diminish U.S. GDP by 0.4 percent in 2028, thus total GDP is projected to be 89.6 percent higher rather than 90 percent higher than GDP in 2006. (EIA, *Analysis of Senate Amendment 2028, the Climate Stewardship Act of 2003*. May 2004. Available: http://www.eia.doe.gov/oiaf/analysispaper/sacsa/pdf/s139amend_analysis.pdf)

[3] Repetto et al. found in a 1997 analysis that, among all U.S. industries producing tradeable goods and services, roughly 90 percent of output and employment was in industries with energy costs representing 3 percent or less of output value. (Repetto, R., C. Maurer and G.C. Bird. "U.S. Competitiveness is Not at Risk in the Climate Negotiations." *WRI Issue Brief*, October 1997.)

[4] The Carbon Trust recently suggested that differences between National Allocation Plans within the EU Emissions Trading system has significant implications on sectoral competitiveness even though country efforts under the overall system are widely viewed as compatible (Carbon Trust, "The European Emissions Trading Scheme: Implications for Industrial Competitiveness." June, 2004. See also IISD, "Climate Change and Competitiveness: A Survey of the Issues," March 2005; and European Commission, "International Trade and Competitiveness Effects," Emissions Trading Policy Brief No. 6, 2003.)

[5] Jaffe,A.B., S.R. Peterson,P.R. Portney, and R.N. Stavins. "Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?" *Journal of Economic Literature*. Vol. XXXIII, March 1995.

[6] Porter, M. "America's Green Strategy," *Scientific American,* 264, 4: 96, 1991; Porter, M. and C. van der Linde, "Toward a New Conception of the Environment-Competitiveness Relationship," *Journal of Economic Perspectives* 9, 4:97-118, 1995.

inherent protection for potentially vulnerable firms by conferring assets whose sale can offset losses.

One option to mitigate potential competitiveness impacts is to provide supplemental allowances to sectors deemed to be vulnerable. Another is to dedicate funds — possibly by auctioning a portion of allowances — to assist vulnerable sectors. Assistance could include:

- Incentives for the deployment of cleaner or more efficient technologies, such as accelerated depreciation of existing stock, or tax credits for the deployment of specific technologies or the production of less emissions-intensive products.
- Support for research and development of long-term technology.
- Transition assistance for workers in sectors likely to experience job losses.

Further steps to address competitiveness would require some mechanism to identify vulnerable sectors based on an analysis of export patterns among energy-intensive industries and relative energy pricing in competing countries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change
Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Pew Center Response

Apart from its limited value in addressing competitiveness, a periodic review of other countries' overall climate efforts would pose serious methodological challenges. No metric is straightforward and all rely at least in part on qualitative assessment or assumptions. Comparing government expenditures is difficult because not all governments tally their climate-related spending and, among those that do, each does it differently. A 2004 GAO report showed, for example, that even in the United States it is difficult to track climate-related expenditures over time.[7] Adoption and implementation of policies that directly or indirectly reduce emissions is another measure of effort, but only a qualitative one, unless the policies' emissions impacts can be reliably quantified.

Even with reliable emissions data, however, any comparison hinges heavily on the chosen indicator. If the measure is emissions intensity, a country like China can show tremendous improvement (a 47% reduction from 1990 to 2000) even as its absolute emissions soar.[8] In per capita terms, India's emissions are projected to rise 50% by 2025, nearly twice the world average, yet will still be just one-fourteenth those of the United States.[9] The measure of "effort" that translates most directly into "result" is absolute emissions. However, among the major emitters, the absolute emission increases projected for 2025 vary tremendously – from roughly 10 percent in the European Union to 130 percent in China.[10] Any reasonable comparison must take into account wide disparities in natural endowment, economic structure, stage of development, and other national circumstances. While such analysis can and should inform the policy process, any determination of "comparability" is ultimately subjective.

If periodic Congressional review is to be mandated, it should also take into account new scientific and technological developments and other factors bearing on the feasibility, cost, and urgency of emissions reduction.

[7] While reported federal spending rose from $3.3 billion in 1993 to $5.1 billion in 2004, the GAO found, the government's accounting had changed considerably over that period as successive administrations added programs not previously counted as climate-related. (US GAO, "Climate Change: Federal Reports on Climate Change Funding Should be Clearer and More Complete." GAO-05-461, August 2005.)

[8] Baumert, K. and J.Pershing, with T. Herzog and M. Markoff. "Climate Data: Insights and Observations." Prepared for the Pew Center on Global Climate Change, November 2004.

[9] EIA. *2005 International Energy Outlook.* DOE/EIA-0484, July 2005.

[10] EIA. *2005 International Energy Outlook.* DOE/EIA-0484, July 2005.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Pew Center Response

Three strategies can provide additional incentive to developing countries to reduce emissions: direct bilateral assistance; multilateral agreements that recognize developing country actions; and market-based incentives through a domestic and/or an international emissions trading system

Bilateral assistance – Direct U.S. support for developing country efforts should be expanded, better targeted, and tailored to the needs of developing countries. The highest priority for most developing countries is economic growth and development. Rather than viewing climate-friendly technology deployment solely as an exercise in increasing exports or funding demonstration projects, our objective should be to integrate climate-friendly activities into national strategies for economic growth, poverty reduction, and sustainable development. For instance, energy policies and plans are critical to achieving economic and development objectives. U.S. assistance should help developing countries build their capacity to assess clean energy options and establish policy frameworks that will favor such options even after our funding assistance is gone.

U.S. assistance also should support and promote efforts by the largest developing countries to identify specific goals for limiting their emissions of greenhouse gases – recognizing that their goals may vary in form, content and timing. One way to do that would be to require that the largest developing countries, in agreeing to receive bilateral assistance, establish goals consistent with their development strategies, and periodically report progress towards meeting them.

Developing country commitments – Achieving broad participation in a strengthened multilateral effort will require a more flexible framework allowing different countries to take on different types of commitments best suited to their national circumstances. In the case of developing countries, this could mean allowing for non-target approaches such as policy commitments in which governments commit to undertake national policies that will advance core economic and development priorities, such as energy access or security, while contributing to climate mitigation. These could include energy efficiency standards, renewable energy targets,

technology standards phasing in advanced electrical generation technologies, or policies to preserve forests and promote sequestration practices.[11]

A multilateral framework allowing such commitments would provide international recognition of developing country efforts and, thereby, an incentive for strengthening these efforts.

Market incentives – An important driver for developing country efforts to reduce emissions is access to emissions trading markets. The Clean Development Mechanism (CDM) established under the Kyoto Protocol enables developing countries to market certified emission reduction credits resulting from projects that reduce emissions below business as usual. Despite a slow startup, the CDM is now operational, with nearly 150 projects approved and several hundred more in the pipeline.

As presently structured, however, the CDM allows crediting only of discrete projects, limiting its potential reach. Kyoto parties agreed recently to open consideration of a more "programmatic" approach that could potentially allow crediting of reductions resulting from a much broader range of activities. One possibility would be crediting of reductions across an entire sector driven by policies such as energy efficiency standards (reductions would have to be quantified and verified). Such an approach could complement the type of policy commitments described above, providing a powerful market incentive for developing countries to enact and faithfully implement such policies.[12]

A programmatic crediting mechanism of this type could be established as an adjunct to a domestic emissions trading system or as a feature of a future multilateral approach.

[11] Pew Center on Global Climate Change. "International Climate Efforts Beyond 2012: Report of the Climate Dialogue at Pocantico." November 15, 2005.

[12] Pew Center on Global Climate Change. "International Climate Efforts Beyond 2012: Report of the Climate Dialogue at Pocantico." November 15, 2005; Figueres, C. "Draft Proposal for the Implementation of Programmatic CDM Project Activities within the Existing Regulatory Framework of CDM Project Activities." Prepared for the Carbon Finance Business Unit of the World Bank, November 29, 2005. Available: http://carbonfinance.org/docs/Programmatic_CDM_Implementation_Paper.pdf.

William Pizer, Senior Fellow, Resources for the Future

Question 4: If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (ie, to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The key to developing country action is likely to be a two-pronged approach. On the one hand, market-based incentives in the U.S. should be structured to provide decentralized, project-level credit, for desirable actions in developing countries. These credits need not follow one-for-one accounting on emissions, but should be linked to the overall desirability of the actions and be somewhat constrained, initially, (either by eligibility, credit level, or explicit limit) in order to prevent volatility in the U.S. trading program until the availability of such credits becomes more predictable.

Alongside this decentralized, market-based approach, there needs to be strategic efforts in conjunction with major players in major developing countries to find ways to meet development goals in the most climate friendly manner. These might involve efforts to make nuclear power accessible, to encourage natural gas use over coal, or to encourage more efficient coal over less efficient coal. Such actions are more likely to be the outcome of a government quid pro quo than a response to credit incentives a project or even sectoral level.

Question 4. Comparable Action
Submitter's Name/Affiliation: Jeff Sterba, PNM Resources

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program?

* * *

There is a difference between delaying implementation of a U.S. climate change program until developing nations commit to a mandatory reduction program and recognizing the need for international action given the scope and nature of climate change. PNM seeks regulatory certainty but also recognizes the critical importance for all nations to address climate change to achieve the necessary emissions reductions over time without disrupting critical economies.

At PNM, we understand the advantage to moving sooner rather than later on climate change and we seek the regulatory certainty that would be provided by climate change particularly if coupled with multi-pollutant legislation. When PNM builds or acquires new generation capacity we do so with a 30-40 year time horizon in mind. Investment decisions we are making today regarding new generation will reverberate for decades and must fit with what we perceive to be the regulatory climate and compliance costs we believe will be in effect during the life of these assets. Accordingly, moving forward on climate change and multi-pollutant legislation is important to providing the regulatory certainty PNM and other utilities need in order to make the resource acquisitions decisions today that are in the best interest of our customers and shareholders.

We recommend the U.S. take a dual track approach to address climate change in the U.S. through legislation and initiatives such as the very promising Asia Pacific Accord to address climate change within other nations, particularly large emitters.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

PCA believes that all nations of the world that are (or will be in the next 10-20 years) significant emitters of greenhouse gases should be participants in programs to reduce emissions. These programs, however, may take various forms. The Asia-Pacific Partnership, for example, could facilitate significant greenhouse gas emission reductions in China and India. Other initiatives may address emissions from other developing nations. PCA does believe, nonetheless, that these programs should be implemented concurrently.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Most nations employ a metric ton of CO_2 or CO_2 equivalent standard.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

A process already exists under the UN Framework Convention on Climate Change, to which the U.S. is a party, which requires "national communications" by signatory nations outlining progress towards achieving the Framework's objectives. It would seem sensible to first assess the strengths and challenges of this system and modify it before creating an entirely new one.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Developing nations should be encouraged to construct energy efficient, sustainable communities.

Question 4. Developing Country Participation

Submitter's Name/Affiliation: Professional Risk Managers International Association (PRMIA)

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Please see answers to clarifying questions below.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Professional Risk Managers International Association (PRMIA)

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Amount of emissions, most bang for buck spent (Barney Spratt, Atlanta, GA, USA, PE, Spratt & Associates)

Based on globalization, international industrial standard should be set up at first. Then governmental cooperation with special projects should be employed. Different nations therefore, could have different area/priority during these cooperation projects. (Steve Yu, Kitchener / Ontario, Canada, Financial Business Analyst, Manulife Financial)

Kyoto Protocol sets these forward. (Mason Wallick, Singapore, Singapore, Project Engineer, R. W. Beck, Inc)

The chart displayed in the white paper would need to be created for all developed and developing countries. Once this has been done, the most valuable metrics will be easily determinable. (Andrew Warshaw, New York, U.S.A., General Member, PRMIA)

The metrics should take into account the accumulation of the past emission history. That is, we have to take into account each country's cumulative emission/pollution amount over the last, say, 50 years. Because the global state we are in is a result of the past accumulation of deeds. (Mustafa Cavus, London, UK, Risk Manager)

Would satellite imagery (infrared for example) be a good proxy? (Michael Grossmann, RI, US, Manager, Atos Consulting)

YOU HAVE got KYOTO PROTOCOL, ISO (INTERNATIONAL STANDARD ORGANIZATIONS) AND BVQI (BUREAU VERITAS QUALITY INTERNATIONAL)....we don't have to make up new metrics or rules! (Ricardo Vanegas, Valencia, Spain, Financial Engineer, Free-Lance Worker)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Professional Risk Managers International Association (PRMIA)

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

A NON-SENSE question. (Mustafa Cavus, London, UK, Risk Manager)

Annual review of industrial standard gap. Annual review of trade condition (which related with energy/greenhouse gas control issues) (Steve Yu, Kitchener / Ontario, Canada, Financial Business Analyst, Manulife Financial)

Emissions should be reported on at least a quarterly but most preferably a monthly basis. (Andrew Warshaw, New York, U.S.A., General Member, PRMIA)

ISO AND BVQI STANDARDS AND PROCEDURES ARE QUITE ORTHODOX PERFORMING TESTS YEARLY! (Ricardo Vanegas, Valencia, Spain, Financial Engineer, Free-Lance Worker)

Kyoto Protocol sets these forward. (Mason Wallick, Singapore, Singapore, Project Engineer, R. W. Beck, Inc)

Say, half a year / or a year for an evaluation (Wilson Yeung, Hong Kong SAR, China)

The transparency and credibility of their national energy statistics is a key factor. There is much opacity and lying in the numbers coming from certain countries, including China. (Michael Grossmann, RI, US, Manager, Atos Consulting)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Professional Risk Managers International Association (PRMIA)

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Bonus...who contribute more, who get more benefit. But need to define the ratio according to the ability (for fairness). (Wilson Yeung, Hong Kong SAR, China)

DEBT RELIEF, FORRESTS INSTEAD OF OPIUM FLOWERS, INTERNATIONAL OFFICERS WATCHING JUNGLES IN AFRICA, ASIA AND AMERICAS...TECHNOLOGICAL DEVICES FOR HEATING, COOKING AND POWER DEMANDS GIVEN AWAY TO POOR COUNTRIES (NO MORE TREES WOULD BE TURNED INTO LOGS) (Ricardo Vanegas, Valencia, Spain, Financial Engineer, Free-Lance Worker)

Including cooperativeness of countries in the overall balance of issues which the US takes into account in deciding who is a friend and who is a foe. (Michael Grossmann, RI, US, Manager, Atos Consulting)

Kyoto Protocol sets these forward. (Mason Wallick, Singapore, Singapore, Project Engineer, R. W. Beck, Inc)

Trade/market share agreement for a particular industry sect, based on energy / environmental cooperation issues. (Steve Yu, Kitchener / Ontario, Canada, Financial Business Analyst, Manulife Financial)

Trading incentives, beneficial import/export limits and relaxed tariff programs can be offered to those countries showing a serious effort in reducing their emissions. (Andrew Warshaw, New York, U.S.A., General Member, PRMIA)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Caroline Choi, Progress Energy Corporation

In responding to the questions raised, Progress is not necessarily endorsing nor opposing the concepts. As noted in our General Comments, it is difficult to comment on a comprehensive approach outside without a specific proposal that includes details of key elements.

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The white paper properly highlights the need for a global effort which assures that the U.S. economy is not placed at a disadvantage. The white paper also notes that "an important component of a U.S. program *could* be to encourage major trading partners and large emitters of greenhouse gases to take actions that are comparable to those in the U.S." (p. 14) (emphasis added). However, it should instead state that ensuring U.S. actions are not more stringent than those of other countries *must* be a key component of any domestic program. Without comparable action by key competitors – both developed and developing – U.S. mandatory reduction efforts would adversely affect U.S. trade and industrial competitiveness while doing little to address overall GHG emissions and global climate change. As has been widely acknowledged, one of the most fundamental flaws of the Kyoto Protocol is that it includes no reduction commitments by key developing countries. Given that the combined CO_2 emissions from China and India are projected to surpass those of the U.S. by 2009, it would be critical that key developing nations also take binding actions to reduce their emissions to ensure an effective global response.

Efforts toward reducing GHG emissions that use voluntary, flexible, technology-based approaches can be effective in making progress toward this goal. An excellent example is the current Asia-Pacific Partnership (AP6) collaboration that involves both developed and developing nations in a cooperative arrangement that will benefit the global environment as well as the economies of the participating countries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Sandalow, Brookings

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Yes, a regular review of what other nations are doing to address global warming should be part of a mandatory market-based program. Such a review would have several benefits, including:

1. Improving U.S. program design. Lessons learned from evaluating actions in other countries could contribute to the steady improvement of U.S. programs over time.

2. Improving program design in other countries. The information assembled in the course of these reviews, and the attention such information would receive, could contribute the steady improvement of program design in other countries.

3. Confidence-building. The confidence gained from regular comparison of control efforts could encourage key countries to take action to address global warming.

Elements critical to the success of a review process include:

1. Each review should be based upon a factual presentation to Congress from a respected, non-partisan source.

2. The official report to Congress should present facts, not judgments. As set forth in more detail below, there is no single correct answer to the question "Are mitigation efforts by Country X comparable to those in the United States?"

3. The mandatory market-based program should continue in force unless Congress acts to modify or terminate the program in light of the review. Designing the mandatory market-based program to sunset absent an affirmative determination by Congress would (i) make creation of a robust emissions trading market difficult, and (ii) deprive businesses of the certainty needed for sound long-term planning.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Sandalow, Brookings

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

There is no single correct answer to the question "Are mitigation efforts by Country X comparable to those in the United States?" Many metrics can be used to help evaluate this question, including:

1. Total greenhouse gas emissions

2. Change in total greenhouse gas emissions in comparison to a base year

3. Greenhouse gas emissions per capita

4. Change in greenhouse gas emissions per capita in comparison to a base year

5. Greenhouse gas emissions per unit of GDP

6. Change in greenhouse gas emissions per unit of GDP in comparison to a base year

7. Use of best available technology in power generation sector

8. Average efficiency of coal-fired power plants

9. Use of IGCC or other clean coal technologies

10. Extent of carbon storage from coal-fired power plants

11. Use of best available technology in transportation fleets

12. Average efficiency of automotive fleets

13. Use of best available technology in building stock

14. Implementation of economy-wide greenhouse gas controls

15. Implementation of greenhouse gas controls in key sectors

16. Legal requirements for use of best available technology in the power generation sector

17. Legal standards for efficiency of automotive fleets

18. Legal standards for energy efficiency of building sector

19. Percentage of greenhouse gases currently in the atmosphere attributable to a specific country

The value of each of these factors may vary from year to year. It is not possible to predict with confidence which factors will provide the most complete picture of any country's mitigation efforts five, 10 or 15 years hence.

Inevitably, advocates for different policy approaches will emphasize different factors in evaluating "comparability" in the course of any review. Such differences in emphasis are entirely appropriate. In enacting a mandatory market-based program, Congress should ensure that it receives the best possible information to evaluate arguments by interest groups during future reviews. Accordingly, (i) Congress should base each review on a factual report from a respected, non-partisan source, and (ii) Congress should not constrain itself by identifying in legislation the relative importance of these factors or authorizing a federal agency to do the same.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Sandalow, Brookings

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Data should be collected from multiple sources, including:

1. Energy Information Administration, U.S. Department of Energy

2. International Energy Agency

3. Organization for Economic Co-operation and Development

4. United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC collects information concerning greenhouse gas emissions and mitigation policies from more than 160 nations.

5. Academic research institutions and NGOs.

Data should be reported to Congress by a respected, non-partisan source. The report should present facts, not judgments.

The evaluation should take place roughly every five years.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: David Sandalow, Brookings

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The most important measure to encourage developing country emissions reductions is enactment by the U.S. Congress of a mandatory market-based program, as called for in the Sense of the Senate Resolution adopted June 22, 2005. Such a step would help overcome the reluctance of many countries to move forward with programs to reduce greenhouse gas emissions in the absence of similar programs in the United States. Enactment of a mandatory market-based program by the U.S. Congress would have a significant "multiplier effect" – inducing other countries to reduce emissions even as we reduce our own.

Other incentives that can be adopted include export credit and loan guarantees to promote the sale of clean energy technologies and concessionary financing (through U.S. and multilateral institutions) for the incremental cost of clean energy facilities such as integrated gasification combined cycle (IGCC) coal plants with carbon capture and storage.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Karen Kerrigan, SBE Council

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Karen Kerrigan, SBE Council

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Karen Kerrigan, SBE Council

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

A mandatory program will damage the U.S. economy and place us at a competitive disadvantage with other countries. An international energy rationing system is not in our best interest and will not reduce emissions. A voluntary approach that encourages the use of technology to reduce emissions is a better way to meet the stated goals. The Asia Pacific Partnership and the Hagel-Pryor Amendment, which the Senate passed in 2005, promote this approach.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Karen Kerrigan, SBE Council

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Karen Kerrigan, SBE Council

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

A global approach needs to be pursued in reducing greenhouse gas emissions as this issue truly involves global engagement. The Asia Pacific Partnership, the Hagel-Pryor amendment, and the Bush administration's policies are approaches that will encourage countries to develop and utilize technologies to reduce emissions and help combat climate change. Technology is the key to reducing emissions in greenhouse gasses. Nations that lead in technology have the strongest economy, which is why the Asia Pacific Partnership (APP) is so important. It encourages countries to work together and share technology to address the problem.

In 1997, the U.S. Senate passed the Byrd-Hagel resolution 95-0 – a sense of the Senate resolution that expressed the view that the U. S. should not be a signatory to any protocol that did not include binding targets and timetables for developing as well as industrialized nations or "would result in serious harm to the economy of the United States".

Byrd-Hagel was a major reason President Clinton did not send Kyoto to be ratified by the Senate. President Bush did not push for Kyoto's ratification either. Furthermore, each time the McCain-Lieberman Climate Stewardship Act (one version of a mandatory cap and trade program with less stringent standards than Kyoto) was voted on it was rejected by the Senate in 2003, 2004, and 2005. Why now would Congress alter a decade of climate change policy by supporting a mandatory cap and trade program, and linking the U.S. to an international system that would damage our economy?

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Sempra Energy supports the recommendation of the National Commission on Energy Policy that calls for stepwise actions. As we stated earlier, Climate Change is an international issue. Unilateral action by the United States may be viewed as an appropriate first step, but in order for the ultimate solution of technology development to make a real difference, the incentives to use these new technologies need to be worldwide. The step approach recommended by the NCEP makes sense.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Clarifying Question 4a:

What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Verification and tracking GHG emissions is a critical element within the process. Because quantification of raw materials is a basic metric used by organizations to assess economic status emission metrics would be most easily verifiable if based on raw material input and standardized emission factors. Although limiting annual tons of CO2 equivalent is a critical performance measure it is equally important to measure compliance effectiveness of developing nations' progress with a metric that compares emissions to efficient conversion of raw materials (efficiency).

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Clarifying Question 4b:

What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Sempra Energy feels that market-based mechanisms allow for most effective and efficient ways to manage emissions. Likewise market-based mechanisms encourage verification protocols which are simplistic and portable. If evaluated on an annual basis it is easier to make policy adjustments.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

An appropriate incentive strategy to encourage developing nations' emission reductions is to promote strategies based upon emission intensity factors. Associating clean development and offset systems would encourage developed nations to manufacture and market energy efficient systems.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Hone & Edward / Shell

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

No.

Investment in energy infrastructure is a long-term undertaking. Whilst the market does not need the exact reduction target for every year far out into the future, it does need sufficient information on which to assess long-term supply-demand forecasts and therefore make some assessment of long-term carbon prices. This then drives investment.

Such information comes from a stated long-term goal for any national programme, and then staying the course.

Including future on-off dependencies based on reviews and assessments of an unknown nature discourages the necessary long-term investment that will deliver the goal. Rather, business will focus much more on short-term compliance.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The Committee asked whether further steps in a mandatory program should be contingent on action from other countries. Southern Company feels that further steps (beyond an initial mandatory U.S. program, to which we are opposed) should definitely be contingent on real actions by other countries. A major failing of the Kyoto Protocol is its lack of requirements for developing countries, whose GHG emissions will soon overtake those of the developed world. However, even many nations subject to the Protocol have made commitments to reductions that are not occurring. Therefore, any further action by the United States should be contingent on **real**, verified reductions in GHG emissions by key trading partners as well as other major emitters.

In addition, such further actions should only be undertaken upon affirmative action by the Congress, and should not be left to the decision of any administrative agency. Importantly, beyond actions by other countries, such further steps by the U.S. should be contingent on many factors – including a demonstration of need (is there convincing scientific evidence that further GHG reductions are needed?), and an assessment of whether technology is available at an affordable cost to make further reductions.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Metrics to be used for comparison of other countries' actions to those by the United States should based on the reduction metrics used by the U.S. – e.g., if the U.S. reduction program is intensity-based (as is preferable), then a comparison should be made to the intensity reductions of other countries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Evaluation of the adequacy of efforts by other nations in order to decide if the U.S. should undertake further actions should take place in the proper international forums and should take place well after implementation of any mandatory programs in the United States.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The United States is making efforts to encourage key developing countries to increase their GHG intensity and to adopt clean technologies through the Asia Pacific Partnership on Clean Development and Climate, as well as through industry/government partnerships like FutureGen. Such efforts should be encouraged through adequate appropriations.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Cathleen Kelly, The Nature Conservancy

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The Nature Conservancy is an international, nonprofit organization dedicated to the conservation of biological diversity. Our mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Our on-the-ground conservation work is carried out in all 50 states and in 27 foreign countries and is supported by approximately one million individual members. We have helped conserve nearly 15 million acres of land in the United States and Canada and more than 102 million acres with local partner organizations globally. The Conservancy owns and manages approximately 1,400 preserves throughout the United States—the largest private system of nature sanctuaries in the world.

Anchored in strong science and supported by our work on the ground, the Conservancy is committed to finding cost-effective, achievable solutions that reduce the impacts of climate change and benefit people and nature.

The Nature Conservancy believes that, because of the United States' large historic responsibility for the climate change problem, our nation must act now to abate greenhouse gas emissions through a mandatory domestic carbon trading program without precondition concerning other nations. Future U.S. actions to reduce emissions even further should be considered in light of the efforts to address climate change by major developed and developing countries and major U.S. trading partners. However, the Congress should avoid setting a rigid, one-size-fits-all quantitative standard under U.S. law. Instead, the Congress should legislate that qualitative standards of equity requiring "comparable" action by developed countries and "equitable" action by developing countries occur before the U.S. level of effort is increased. To keep the Congress well informed of foreign efforts, the President should be required to report at regular intervals (perhaps every two years) on whether foreign efforts to reduce greenhouse gas emissions are "comparable" or "equitable" to U.S. action.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Cathleen Kelly, The Nature Conservancy

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Developed and developing country efforts to reduce emissions should be evaluated using different metrics since they differ significantly in: the level of historic responsibility for climate change, the capacity to address climate change and overall wealth. The Congress should avoid setting a rigid, quantitative standard for future increases in U.S. efforts since no single quantitative metric is likely to prove sufficiently accurate or equitable for countries with markedly different economic conditions and resource endowments. The Congress could legislate that qualitative standards of equity requiring "comparable" action by developed countries and "equitable" action by developing countries occur before the U.S. level of effort is increased. The President should be required to report at regular intervals (perhaps every two years) on whether foreign efforts to reduce greenhouse gas emissions are "comparable" or "equitable" to U.S. action. In determining whether or not developed and developing countries have met the required level of effort the President consider the following factors in the analysis of each country's efforts:

- the historic share of global greenhouse gas emissions
- trends in greenhouse gas emissions
- trends in per capita emissions
- trends in the carbon intensity of the economy
- existing policies and measures to improve energy efficiency and reduce emissions
- per capita GDP

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Cathleen Kelly, The Nature Conservancy

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

The Congress should avoid setting a rigid, quantitative standard for future increases in U.S. efforts since no single quantitative metric is likely to prove sufficiently accurate or equitable for countries with markedly different economic conditions and resource endowments. The Congress could legislate that qualitative standards of equity requiring "comparable" action by developed countries and "equitable" action by developing countries occur before the U.S. level of effort is increased. The President should be required to report at regular intervals (perhaps every two years) on whether foreign efforts to reduce greenhouse gas emissions are "comparable" or "equitable" to U.S. action. In determining whether or not developed and developing countries have met the required level of effort the President consider the following factors in the analysis of each country's efforts:

- the historic share of global greenhouse gas emissions
- trends in greenhouse gas emissions
- trends in per capita emissions
- trends in the carbon intensity of the economy
- existing policies and measures to improve energy efficiency and reduce emissions
- per capita GDP

Based on the President's biennial report, future Congresses will decide whether or not to increase the U.S. level of effort to address climate change.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Cathleen Kelly, The Nature Conservancy

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

The Nature Conservancy believes that the best approach to encourage developing country emissions reductions is for the United States to play a leadership role by creating a mandatory greenhouse gas reduction program that would serve as a model for other countries to reduce their emissions.

In addition to reducing greenhouse gases domestically, one area where the United States could encourage developing country emissions reductions is by providing financial and technical assistance to reduce tropical deforestation. Emissions from tropical deforestation are not covered under the United Nations Framework Convention on Climate Change or under the Kyoto Protocol despite being the source of 20-25% of global carbon dioxide emissions – roughly the same level as the United States – and accounting for the majority of emissions in major developing countries such as Brazil and Indonesia. Further, it is likely that emissions from deforestation can be reduced at a lower cost than emissions from energy use and industry within the United States. By allowing the storage of carbon dioxide in plants and soils in developing countries to be included in the offsets program, U.S. climate regulations would help abate emissions in developing countries while lowering the costs to U.S. industries.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Margo Thorning, American Council for Capital Formation

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Response to White Paper Question 4 by Dr. Margo Thorning, Senior Vice President and Chief Economist, American Council for Capital Formation,

Answer: Involving developing countries like China, India, Indonesia and Brazil is required to achieve meaningful progress in limiting the growth in global emissions. However, in climate policy discussions before, during and after the negotiations on the Kyoto Protocol, developing countries like China and India made it clear they would simply not participate in mandatory programs that would place a cap on their emissions that would be in direct conflict with their growing populations and need to improve their citizens' standard of living. The notion that the developing countries would join a US cap/trade program when they rejected mandatory obligations under the Kyoto Protocol program is simply unrealistic.

Recently China and India indicated that they are willing to participate in voluntary technology based efforts to improve their citizens' standard of living, while addressing ground-level pollution issues as well as climate concerns. The recently initiated Asia-Pacific Partnership on Clean Development and Climate is an example of this. Drawing on developing country willingness to participate in multi-national joint voluntary programs that focus on improving technology that addresses other issues like ground-level pollution and improved living standards – while also allowing progress on climate issues -- may be a much more productive approach than mandatory cap/trade programs.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Margo Thorning, American Council for Capital Formation

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Margo Thorning, American Council for Capital Formation

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Margo Thorning, American Council for Capital Formation

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

The U.S. should not take unilateral action to reduce greenhouse gas emissions unless other nations are also part of a mandatory, market-based program. A unilateral cap on emissions would impose a significant drag on the U.S. economy by stifling the most productive sectors that rely on fossil fuel-powered electricity.

If the United States is committed to addressing global climate change, it must realize that reducing its own emissions will not achieve this end. Industrialized countries must seek to involve developing countries in this effort, as the latter are significant contributors to climate change and will in fact overtake the developed world in share of contribution within twenty years. A unilateral approach achieves nothing but economic ruin.

Both the G-8 and the six nations in the Asia-Pacific Partnership for Clean Development and Climate have recognized the undesirability and inefficacy of the Kyoto-style approach to addressing climate change and have adopted the voluntary, technology-based approach. This latter tactic holds great promise for reducing the greenhouse gas emissions of developing nations, a huge contributor to global climate change that effectively remains ignored under the Kyoto Protocol and existing national and regional cap-and-trade programs.

The only metric that matters to the atmosphere is tons of carbon dioxide-equivalent. Until we can ensure that these tons are reduced and stabilized globally on a scale that matters, there is no point in constraining our vibrant national economy and in pushing our industries offshore to locales that refuse to address greenhouse gases. The emissions we would reduce under a mandatory, market-based program in the U.S. would not be significant enough to put a dent in the problem and, to be sure, would leak because of the export of industry overseas where carbon intensity is even higher than it is in the United States.

TXU advocates a global, voluntary, technology-based approach as the most promising effective tool to reduce greenhouse gases in both developed and developing countries. A

mandatory approach will not produce meaningful environmental benefits and will harm our economy.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

TXU opposes a mandatory, cap-and-trade approach unless it involves all of the world's economies. The United States must continue its efforts along the lines of the Asia-Pacific Partnership for Clean Development and Climate to promote the active involvement of developing nations in reducing their greenhouse gases. Climate change is caused by excessive emissions of tons of greenhouse gases -- the source of those gases is not relevant. Developed and developing nations alike must reduce their emissions if climate change is to be effectively addressed.

If the U.S. were to implement a mandatory cap-and-trade program for greenhouse gases in the absence of a global program that includes developing nations, global climate change would not be meaningfully addressed. TXU does not see the benefits of effectively exporting U.S. emissions to jurisdictions that do not regulate greenhouse gases, when only a small fraction of global emissions would be avoided (those from industries that cannot move overseas).

TXU urges the Committee to consider following in the path of the G-8 and Asia-Pacific Partnership to promote the voluntary development and deployment globally of new technologies that will effectively reduce greenhouse gas emissions.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

TXU strongly supports voluntary, technology-based programs like the Asia-Pacific Partnership for Clean Development and Climate. The Partnership provides significant incentives for both encouraging the development of new emissions-reducing technologies and for the deployment of these technologies worldwide, particularly in the rapidly growing nations of East Asia that already have significant greenhouse gas emissions. If developing countries continue to refuse to adopt caps on their emissions, technology transfer incentives are perhaps the only way to ensure that climate change is effectively addressed. Without their participation, the efforts of industrialized countries are futile.

The U.S. must continue its leadership role in the Asia-Pacific Partnership and should consider expanding these efforts to include other nations. The resources of all industrialized nations should be contributed and leveraged along with the private sector to ensure that advanced technologies are developed to reduce emissions. While China, India and South Korea are significant developing country emitters, a large number of other developing countries are contributing to climate change through their rapidly growing emissions. A global approach is needed to ensure emissions are reduced without creating a drag on the global economy. A mandatory, market-based approach will not achieve environmental benefits and will harm the economy. A voluntary approach that involves the entire world is needed -- TXU supports the Administration's efforts in the G-8 and Asia-Pacific Partnership and urges the U.S. Congress to do the same.

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Union of Concerned Scientists

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

The United States can best encourage action by other nations by getting our own house in order. With the exception of Australia, other industrialized nations have made commitments to reduce or at least stabilize their emissions of carbon dioxide and other greenhouse gases. By contrast, U.S. carbon emissions will increase some 37 percent over the next 25 years, under the Energy Information Administration's latest business-as-usual projections. Reductions in U.S. emissions of 60 percent or more (together with commensurate reductions by other industrialized countries and lesser, though still significant, reductions by major developing countries) will almost certainly be needed by mid-century if we are to stabilize atmospheric greenhouse gas concentrations at the levels needed to avoid widespread, severe impacts on ecosystems and human communities.

Major developing countries such as China and India, while not yet taking on absolute emission limitation commitments, are actively implementing policies and measures that will slow their emissions growth. In some cases, these policy commitments are more aggressive than those here in the United States. For example, China has committed to increase renewable energy from the current 3 percent share of its energy supply to 10 percent by 2020; a similar standard was twice passed by the United States Senate as part of national energy legislation, but failed to make it into law due to opposition from the House of Representatives and the White House. Also, China has adopted fuel economy standards that will require 32 different weight-based light vehicle classes to achieve between 21 and 43 miles-per-gallon by 2008. A 2004 analysis by the World Resources Institute[1] found that only 19 percent of U.S. cars and 14 percent of U.S. light trucks would meet China's new standard. Given these developments, as well as the fact that the United States represents nearly one-quarter of the total emissions problem and has per-capita emissions nearly eight times those of China and nearly twenty times those of India, it is neither politically viable nor morally defensible to say we should only take limited action until these countries do much more.

Finally, as other industrialized and major developing countries pursue strategies to reduce emissions, demand for clean energy and vehicle technologies will increase sharply. An aggressive U.S. emissions reduction program will position U.S. companies to compete in these growing markets, by stimulating strong domestic demand for low- and zero-carbon technologies. It will also stimulate greater technological innovation and learning-by-doing reductions in the cost of climate-friendly technologies; this in turn, will make developing countries' efforts to limit their emissions more affordable.

[1] World Resources Institute, "How Do the Chinese Standards Compare with Other Fuel Economy Programs?" July, 2004

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Union of Concerned Scientists

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Union of Concerned Scientists

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Union of Concerned Scientists

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Please begin your response HERE. (no page limit)

Question 4. Developing Country Participation
Submitter's Name/Affiliation: Jonathan Pershing, World Resources Institute

If a key element of the proposed U.S. system is to "encourage comparable action by other nations that are major trading partners and key contributors to global emissions," should the design concepts in the NCEP plan (i.e., to take some action and then make further steps contingent on a review of what these other nations do) be part of a mandatory market-based program? If so, how?

In this response we present a rationale for the following:

1. There is no single metric for evaluating relative efforts of different countries, although there is a range of metrics that can throw light on the question.

2. The United States has long accepted the principle of "differentiated" responsibilities in dealing with climate change. Given the widely varying national circumstances among countries, the appropriate consideration is whether international partners are taking *appropriate* levels of action rather than *equal* levels of effort to the United States.

3. While making part of United States policy formally *contingent* on specific actions in other nations would be counter-productive, formal or informal review of relative efforts are a normal part of international negotiations. The United States has several plausible options for providing incentives to developing countries to take action on GHG emissions

Climate change is a global problem. Accordingly, the U.S. should consider the efforts being made by other countries to limit GHG emissions as a relevant consideration in formulating its own response to climate change. Dangerous human-induced climate change cannot be avoided without significant participation of the major-emitting countries (Table 1). The 12 highest-emitting countries comprise 75% of global emissions (taking the European Union as a single entity). These countries also account for 77% of U.S. exports and an equal share of U.S. imports.[1] Focusing on the individual and collective efforts of these countries should be an important consideration of the U.S. government.

It is not necessarily the case, however, that all countries should be expected to undertake an equal level of effort or equal emission reductions. The U.S. has long supported the view that national responses should be "differentiated" according to national circumstances faced by different countries, and that some countries should be expected to contribute greater efforts than others. This principle is embodied in the 1992 Climate Convention,[2] which has been ratified by the U.S. with unanimous support from the Senate.

Table 1. Top Greenhouse Gas Emitting Countries (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6)

Country	$MtCO_2$ equivalent	% of World GHGs
1. United States	6,928	20.6%
2. China	4,938	14.7%
3. EU-25	4,725	14.0%
4. Russia	1,915	5.7%
5. India	1,884	5.6%
6. Japan	1,317	3.9%
7. Brazil	851	2.5%
8. Canada	680	2.0%
9. South Korea	521	1.5%
10. Mexico	512	1.5%
11. Indonesia	503	1.5%
12. Australia	491	1.5%
Rest of World	**8,401**	**25%**
Sources & Notes: World Resources Institute, Climate Analysis Indicators Tool (CAIT, v. 3.0). Totals exclude emissions from international bunker fuels and land use change and forestry. 2000 data.		

An evaluation of relative efforts across countries is not simple (see response to 4a). Likewise, how the U.S. establishes its actions as "contingent" on the actions of others will need to take into account the realities of international cooperation on such a complex issue (see response to 4b). On a positive note, the United States has several plausible options for providing incentives to developing countries to take action on GHG emissions (see response to 4c).

Clarifying Question 4a:

- What metrics are most valuable for comparison of developed and developing country mitigation efforts to U.S. efforts?

There is a series of metrics and indicators that, when taken together, enable reasonable comparisons to be made across countries. These metrics are both quantitative (e.g., emissions indicators) and qualitative (e.g., policies adopted).

However, international comparisons are fraught with challenges. For instance, it is not even obvious what it is that should be compared. The domestic mitigation *efforts* of a country, the *results* of those efforts, the efforts at helping *other countries*, and the overseas results achieved all seem to be relevant criteria when making cross-country comparisons.[3] Likewise, some policy actions (e.g., carbon tax) will result in *immediate* effects, whereas others (e.g., R&D) are expected to bear fruit over decadal timescales. Further complicating matters is that, as explained above, not all countries are expected to undertake the same level of efforts (or results). In particular, there is broad international consensus that those poorer countries with less financial, technological, and administrative capacities are not expected to expend the same amount of effort as other countries that have contributed to the build-up of GHGs in the atmosphere and have the financial and technological means to rein in emissions.

Recognizing the complexities, it is clear that no single metric alone can adequately capture the relative mitigation efforts. Accordingly, a basket of metrics should be considered together when attempting to make even-handed comparisons across multiple countries. A few of the most important indicators are discussed below. The indicators and observations below are drawn from WRI's Climate Analysis Indicators Tool[4] and the 2005 WRI report *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy.*[5]

A. Emissions Indicators[6]

1. Absolute GHG Emissions (six gases)

The absolute emissions indicator is important for two reasons. First, it is a measure of each country's marginal (i.e., annual) contribution to the atmospheric buildup of GHGs. Second, it is a measure that near-term policies and technological innovations can influence. Accordingly, country-level changes in absolute emissions should be evaluated *over time*. Attempts to evaluate the effects of a specific measure may call for the use of sectoral rather than national data (e.g., transportation, electric power, agriculture, etc.) (See Indicator 4 below).

2. GHG Emissions Per Capita

GHG emissions per capita is a useful indicator because it measures *relative* emissions. Looking only at absolute emissions (Indicator 1, above) may be misleading, particularly when making evaluations between developed and developing countries. Some developing countries,

such as India, may have high absolute emission levels (5th in the world), but low emissions per capita (140th). For these countries, reductions in absolute emissions (Indicator 1) are very unlikely *even under aggressive emission reduction policies*. The reason is that most individuals in India do not yet have access to modern electricity and transportation services. Thus, cleaner development may restrain emissions growth, but not necessarily lead to an absolute decline in emissions.

Useful insights may be gained by examining changes in GHG emissions per capita *over time*. Many factors influence changes in absolute emissions (Indicator 1), including population growth, economic growth, changes in energy fuels, and changes in economic activities (e.g., shift toward services). Per capita trends over time control for the effect of population growth on emissions growth. For example, one factor that explains why U.S. emissions have consistently grown faster than Europe's is the U.S. population is growing at about four times the rate of Europe's.[7] Comparing absolute and per capita growth rates can reveal this effect.

3. CO_2 Intensity of Economy

CO_2 intensity is emissions per unit of activity (e.g., gross domestic product [GDP], at the national level). This indicator is a function of a country's fuel mix (CO_2 per unit energy) and energy intensity (energy per unit GDP). Energy intensity, in turn, is a function of energy efficiencies and economic structure (e.g., an economy dominated by heavy industrial production would likely have a higher energy intensity than one where the service sector is dominant).

CO_2 intensity is useful for two reasons. First, over time, this indicator is *not* driven heavily by economic and population growth (unlike Indicator 1). Second, the factors that do drive changes in CO_2 intensity—namely, fuel mix and energy efficiency—are important policy targets. Thus, examining trends in emissions intensity should reflect progress (or lack thereof) in these important areas. It should be noted, however, that even in the absence of climate change policy, this indicator tends to naturally decline in many countries, for example, due to technological development and shifts away from energy-intensive production processes, which has been the experience in the Untied States.

4. Sectoral and Fuel Indicators

Depending upon the policy being assessed, there are a range of other useful indicators. Examples include:

- If policy efforts are aimed at shifting away from coal and oil consumption nationwide, an important indicator would be the carbon intensity of fuel supply (CO_2 emissions per unit of energy consumption).

- If policy efforts are targeted at motor vehicle efficiency, then CO_2 emission trends in the transport sector should be evaluated, including both absolute and per capita trends.

5. Energy Consumption Per Capita

This indicator is important for reasons similar to GHG per capita, however it also provides some additional context because energy use in many countries is the largest source of GHG emissions. Other factors held constant, countries with high energy use may be more capable of reducing GHG emissions through policy interventions compared to those countries with low levels of energy use. This is due in part to the differing penetration rates of energy-intensive goods, particularly across North-South lines. In many developing countries, the penetration of refrigerators, air-conditioners, televisions, computers, automobiles, etc.—all of which require energy—is low compared with industrialized countries. As societies develop, it is expected that energy use will increase, even in the context of climate policy interventions. However, the degree to which expanded energy consumption increases *emissions* will depend upon the carbon intensity of the fuel supply (see Indicator 4).

B. Socio-Economic Indicators

These metrics, while less useful for comparing actual emissions efforts, do provide critical context for evaluating national circumstances – which in turn aids in assessing the appropriateness of climate programs being adopted and implemented.

6. Gross Domestic Product (GDP)

GDP—the aggregate level of economic activity within a country's borders—is important because it is a major driver of GHG emissions. Accordingly, changes in GDP over time can be an important variable in explaining changes in emission levels (Indicators 1 and 2). For example, it may be difficult to detect the effect of strong emission-reduction policies in the context of very rapid economic growth (e.g., China). Alternatively, some countries may have declining emissions due to economic recession even though they are making little effort to restrain emissions (e.g., Russia and Ukraine). Thus, GDP shifts can provide essential context for understanding absolute emissions shifts.

7. GDP Per Capita

GDP per capita (i.e., income levels) provides a reasonable, though imperfect, measure for comparing levels of economic development. GDP per capita is a crude proxy of financial, administrative, and technical capacity within a country. Low-income countries also tend to have low education levels, significant public health problems, and relatively poor governance capabilities. Accordingly, those countries with very low levels of income cannot reasonably be expected to expend the same level of effort and financial commitment to climate protection as those countries with high income levels.

C. National Policies

Quantitative metrics, such as those discussed above, are only conducive to assessing (1) the macro effects of climate policies (or lack thereof) and (2) the level of effort on climate policy

that countries should reasonably be expected to undertake. Quantitative indicators do not measure the level of effort on climate policy that a country *actually undertakes*. To gauge actual efforts, it is necessary to assess the actual policies and measures adopted. In making these assessments, WRI recommends the consideration of the following factors that, when taken together, provide a basis for comparative assessments.

1. Form of Action. This may include the following:
    a. *Fiscal Measures*. Taxes (including exemptions, credits, etc.), fees, etc.
    b. *Market and Regulatory Measures.* Cap and trade, mandates (products, processes), standards, sectoral regulatory reforms (e.g., electricity), product labeling, etc.
    c. *Industry Agreements*. Corporate challenges, public-private partnerships, etc.

2. Stringency/Magnitude of Action. What level of effort is required under the particular measure? E.g., level of emission target, size of tax or subsidy, stringency of technology or performance standard, etc.

3. Legal Character. Are the policies and measures mandatory? If so, what are the accountability provisions with respect to reporting and review of compliance?

4. Scope of Action. What sectors, processes, or fuels are covered? E.g., energy production, buildings, industry subsectors, transportation, waste, forestry, agriculture, etc. What share of a country's emissions do the policies and measures cover? Scope of action can also be international, in that they are aimed at assisting other countries, in particular developing countries (e.g., through aid, export credits, etc).

5. Status. Is the measure planned or already enacted?

The above classifications provide a starting point for making meaningful comparisons. Once policies and measures are classified, additional considerations include:

- Given that countries are not all capable of, or are expected to, perform equally, how much effort should a given country reasonably be expected to undertake?

- Across what timescales should efforts be evaluated? Should policies that result in certain and immediate emission reductions be weighted more heavily than policies that may result in longer term reductions?

- How to compare stringencies across different forms of policy actions (e.g., technology standard versus an emissions cap)?

Accessing National Policy Information

There is a large literature on national climate policies, although in many cases up-to-date information requires gathering information directly from national sources. However, there are also several international sources that compile information on multiple countries, including the following:

1. National Communications. The most comparable repository of climate change policies and measures enacted by governments can be found in the National Communications to the Climate Change Convention. Each National Communication includes a section describing the policies and measures countries have adopted to reduce GHG emissions. These reports are submitted approximately every three to four years by Annex I (industrialized and transition) countries, including the United States. One major shortcoming of these reports is their poor coverage of developing (non-Annex I) countries. These reports are available from the Convention Secretariat at: http://unfccc.int/national_reports/items/1408.php.

2. International Energy Agency (IEA) Policies and Measures Database. The IEA maintains a database of climate change policies and measures that are planned or adopted by IEA member countries (including the U.S.). This database can be queried by a range of criteria, including country, year (of policy/measure), policy type (e.g., fiscal, regulatory), sector, and energy source. The database is high quality, but has several limitations, including that it is limited to IEA member countries and includes only *energy-related* policies and measures. The database can be accessed at: http://www.iea.org/textbase/pamsdb/search.aspx?mode=cc.

3. WRI Draft SD-PAMs Database. Modeled on the IEA database, WRI is in the process of developing a database that details the policies and measures planned or adopted in selected *developing countries*. In addition to "climate-specific" actions, the database includes so-called sustainable development policies and measures (SD-PAMs); i.e., policies, programs, regulations or other measures implemented that aim to achieve national or local goals but that have a beneficial effect on the climate by reducing emissions of greenhouse gases. The database covers measures from a range of sectors, including building efficiency, energy production, industry, transport, agriculture, and forestry, and can be queried by country, policy type, sector or motivation. Although currently in draft form, the database is a useful tool for identifying the efforts that developing countries are taking toward reducing their emissions. The draft database can be accessed at: http://cait.wri.org/sdpams

Clarifying Question 4b:

- What process should be used to evaluate the efforts of other nations and how frequently should such an evaluation take place?

There are a variety of means through which the United States should evaluate the efforts of other countries, including the following:

1. Comparison study

As discussed in the response to 4a, cross-country evaluations are not simple. There is no ready formula that can be used to make balanced international comparisons. Accordingly, a competent government agency could be tasked with undertaking a study involving the top 12-15 emitting countries (e.g., those shown in Table 1). This study should also include an evaluation of the United States' domestic actions and international efforts.

2. International negotiations

Intergovernmental negotiation processes regularly evaluate—formally or informally—relative efforts across countries. Indeed, this is a normal feature of international negotiations on trade, arms control, and environment, among others. For example, NATO's "burden-sharing" exercise involved "targets for national military participation, conscription of soldiers, investments in equipment, contributions to military infrastructure and real estate, and so on . . . . [T]he process was one of reciprocal scrutiny and cross-examination, with high-level officials spending months negotiating."[8]

Prior to adopting domestic commitments, the United States should develop an understanding of the relative efforts of other countries. However, because the United States has contributed more than any other country to the buildup of CO_2 and other GHGs in the atmosphere, there is a widely-held expectation that the U.S. should take a leadership role in the international efforts to address GHG emissions. To date, the perceived lack of action by the U.S. has been used by some countries to forestall their own efforts on GHG abatement.

Along these lines, the United States should be very cautious about establishing criteria that other countries should meet as a condition for U.S. action. For example, in the 1997 Byrd-Hagel Resolution the U.S. Senate insisted that, as a condition of U.S. participation in a climate treaty, developing countries must adopt "specific scheduled commitments to limit or reduce GHG emissions … within the same compliance period" as the commitment of the United States.[9]

Rather than enhancing U.S. bargaining power, the resolution was perceived as unreasonable by most governments and contrary to the Climate Convention—under which the United States and other industrialized countries promised to "take the lead in combating climate change."[10] The perception created by the Byrd-Hagel resolution was that the United States was not serious

about dealing with climate change. In this context, the resolution gave developing countries good reason *not* to take stronger measures to rein in emissions.

These kinds of legislative or policy formulations should be avoided in the future, as they have harmful, if unintended, foreign policy effects. Prior to adopting extra-territorial "conditions" on other countries, the United States should consider a "reciprocity test": what would be the U.S. reaction, for instance, to a provision adopted by the Indian Parliament which conditioned Indian actions on those of the United States? Such measures are not a constructive way of addressing climate change and therefore should be discouraged by the United States and other countries. A more fruitful process is one where the United States engages in international negotiations and, to support those negotiations, undertakes even-handed evaluations of the efforts of all major emitting countries (including the United States itself). In the ensuing legislation, the form and stringency of U.S. actions adopted should be informed by the efforts of other countries. Experience suggests, however, that making U.S. action contingent upon the actions of other countries can be counter-productive for all parties.

Clarifying Question 4c:

- Are there additional incentives that can be adopted to encourage developing country emission reductions?

Yes. There are a number of measures that the United States can take to incentivize developing country emission reductions, including the following:

1. Crediting Mechanism

A U.S. emissions trading program could recognize emission reductions achieved in developing countries. For example, if a U.S. company invests in an industrial facility in Mexico that results in GHG emission reductions, and those reductions are verified by a third party, U.S. legislation could allow those emission reductions to be credited against the obligations of a domestic source. Such a program would have the dual advantage of promoting emission reductions in developing countries while also reducing compliance costs to U.S. companies. Presently, the European Union has such a provision in its Emissions Trading System.[11] WRI together with the World Business Council on Sustainable Development have developed guidance on how such project mechanisms can be made to work effectively[12].

2. Export Credits

The U.S. government routinely supports private domestic companies with preferential trade financing (e.g., loans of short-term maturity) for the export of equipment or services. (These and other financial services are provided through the Export-Import Bank of the United States and the Overseas Private Investment Corporation.) "Greening" the U.S. export credit portfolio and supporting international environmental standards—including GHG standards—governing all export credit agencies could significantly further emission reduction efforts in developing countries.[13]

3. Removal of Trade Barriers

The United States can work with other countries—particularly developing countries to reduce trade barriers to clean energy technologies and services. This involves removal of barriers imposed by other countries, as well as the United States' own barriers to the clean energy exports of other countries. For instance, the United States prevents Brazilian ethanol from entering the domestic market by levying a 54-cent per gallon tax on imports.

4. Clean Technology Development and Diffusion

Certain clean technologies, if developed in the United States, are likely to diffuse to developing countries through market forces, resulting in emissions savings. This is particularly true for products that are widely tradable, such as motor vehicles.[14] Most motor vehicles are produced (and sold) in industrialized countries by a relatively small number of manufacturers.

Developing countries, on the other hand, tend to rely on either imports or licensed production. Under these conditions, technology diffusion can be surprisingly quick, as exemplified by the spread of catalytic converter technologies. An essential prerequisite for such diffusion, however, is that the United States (and preferably Europe and Japan as well) needs to adopt clean technology standards for various products, such as automobiles.

Other technology options, such as carbon capture and storage (CCS), also hold promise. To achieve market penetration, however, this technology will likely need to be developed in the United States (and perhaps other industrialized countries) with financial support to promote developing-country uptake. The reason is that there are virtually no development benefits to adopting CCS technology. For the foreseeable future, developing countries will be focused on providing electricity *access* to their populations, rather than devoting scarce resources to CO_2 capture and storage.[15]

5. Aid and other Financial Assistance

The U.S. foreign assistance already includes programs to reduce GHG emissions in developing countries. These come in the form of bilateral assistance and multilateral assistance (e.g., the Global Environment Facility). These efforts can be maintained and strengthened.

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By reinvigorating existing initiatives above and launching several new ones, the United States could contribute substantially to greening financial flows to developing countries and promoting clean technology transfer.

To be most effective, as discussed above, initiatives should be targeted at the major developing countries, in particular China and India. These two countries comprise 38 percent of the world's population—almost as much as all other developing countries combined. These two countries, which already have fast-growing middle classes, will soon demand energy and transport services resembling those of the developed world. Ensuring that those services can be delivered in a low-carbon context is perhaps the biggest challenge to restraining global emissions over the coming decades.

[1] World Trade Organization. 2005. *World Trade Statistics*. Geneva. *See* Table III.16. Other economies (not shown in Table 1) that comprise a significant share of U.S. exports are Taiwan (2.7%), Singapore (2.4%), and Hong Kong (1.9%).
[2] Article 3, United Nations Framework Convention on Climate Change (UNFCCC). 1992. *Available at*: http://unfccc.int/resource/docs/convkp/conveng.pdf.
[3] *See* Philibert, C. 2005. Climate Mitigation: Integrating Approaches for Future International Cooperation. Annex I Expert Group to the UNFCCC. Paris: OECD/IEA.
[4] Climate Analysis Indicators Tool (CAIT) version 3.0. 2006. Washington, DC: World Resources Institute. Available at http://cait.wri.org.

[5] In 2005, WRI undertook a comprehensive effort to evaluate a wide range of indicators. *See* Baumert, K.A., T. Herzog, and J. Pershing. 2005. *Navigating the Numbers: Greenhouse Gas Data and International Climate Policy*. Washington, DC: World Resources Institute, *available at*: http://climate.wri.org/pubs_description.cfm?PubID=4093.
[6] Data on all of the indicators described can be accessed free of charge from WRI's Climate Analysis Indicators Tool (CAIT) (http://cait.wri.org). CAIT includes data for all countries, all greenhouse gases, and all major economic sectors.
[7] *See* Baumert et al., *supra* note 5, at 23 (analyzing effects of population growth on U.S. and EU CO_2 growth over the 1990 to 2002 period).
[8] Schelling, T.C. 2002. "What Makes Greenhouse Sense?" *Foreign Affairs*. May/June.
[9] S. Res. 98, 105th Cong. (1997).
[10] *See* UNFCCC, *supra* note 2, at Art. 3.1.
[11] This link was established through Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms.
[12] Greenhouse Gas Protocol: The GHG Protocol for Project Accounting. Available at http://climate.wri.org/ghgprojectaccounting-pub-4039.html
[13] *See* Harmon, J., C. Maurer, J. Sohn and T. Carbonell. 2005. *Diverging Paths: What future for export credit agencies in development finance?* Washington, DC: World Resources Institute, *available at*: http://climate.wri.org/divergingpaths-pub-3930.html; and C. Maurer with R. Bhandari. 2000. *The Climate of Export Credit Agencies*. Washington, DC: World Resources Institute, *available at*: http://climate.wri.org/climateexportcreditagencies-pub-3005.html.
[14] *See* Baumert, K., C. Dasgupta, and B. Müller. 2003. "How Can the Transatlantic Partners Help in Addressing Developing Country Emissions?" *in* A. Ochs and A. Venturelli (eds.), *Towards Transatlantic Consensus on Climate Change*.
[15] *See* Mwakasonda, S. and H. Winkler. 2005. "Carbon Capture and Storage in South Africa" *in* R. Bradley and K. Baumert (eds.), *Growing in the Greenhouse: Protecting the Climate by Putting Development First*.