Question 3. International Linkage
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

ACEEE support the concept of international emissions trading. However, we also recommend that offset policies be limited, and that intra-U.S. emission reductions be the primary emphasis of a U.S. climate policy. Energy efficiency has been shown to produce very positive economic benefits for the U.S., and so we recommend that U.S policies seek to tap efficiency among other clean energy policies, for their domestic economic benefits. Limited international offsets, to the extent they can be rigorously documented as additional and verifiable, should be allowed to give covered entities flexibility and to reduce the costs of the policy.

Question 3. International Linkage
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

ACEEE has no specific comments on this question.

Question 3. International Linkage
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

ACEEE has no specific comments on this question.

Question 3. International Linkage
Submitter's Name/Affiliation: William Prindle, Deputy Director, ACEEE

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

ACEEE has no specific comments on this question.

Question 3. International Linkage-AEP
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

American Electric Power (AEP) does not support a mandatory greenhouse gas regulatory program 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 the policy proposals in the White Paper, AEP believes it is important to fully engage and comment on these questions when requested by the Committee.

AEP is very supportive of mechanisms to link any US system with other countries around the world. Extending the GHG markets as broadly as possible is consistent with the global nature of climate change issue. Greater linkage will mean a broader geographical scope of trading, more liquidity, and encourage the most cost-effective reductions of greenhouse gases. This in turn will lower compliance costs and minimize total economic impacts from the program. For example, linkages to offsets programs in developing countries will allow access to less expensive GHG reductions or sequestration, such as through forestry, land use and methane capture. We believe the potential benefits of linkage are substantial and outweigh any potential administrative challenges.

However, specific linkages to current or emerging greenhouse gas trading programs such as the European Union (EU) system, may not be necessary or even advisable in order for the U.S. to realize the benefits of broader international trading. The EU system is a currently a CO2 only system which covers only about half of EU CO2 emissions, so linkage with this system at present may not provide much benefit to the U.S. Instead, unrestricted linkages with international offset project opportunities may offer most of the international cost-effective reduction and trading opportunities. As such, the U.S. program should be designed with possible linkages in mind, but not restricted in any way in order to accommodate these linkages.

Question 3. International Linkage-AEP
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Question 3. International Linkage-AEP
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Question 3. International Linkage-AEP
Submitter's Name/Affiliation: Dennis Welch, American Electric Power

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Question 3. International Linkage
Submitter's Name/Affiliation: Steve Walsh/AES Corp.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Question 3. International Linkage
Submitter's Name/Affiliation: Steve Walsh/AES Corp.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

As a large, global electric power and distribution company AES sees only benefit in having as geographically broad a GHG program as possible. The larger the geographic extent of the program, the greater the potential to minimize compliance costs to the extent possible and to effectively address the overall problem. Global warming is a global issue. Having a patchwork quilt of programs across the planet can only lead to inefficiencies. The fact that there may be difficulties in developing a program that can be linked with other GHG programs isn't a reason not to pursue this beneficial goal.

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

Question 3

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

In general, the concept of allowing trading with similarly structured programs around the world could yield economic benefits by increasing the size of the allowance pool and the number of participants. However, if not addressed properly, linking systems would lead to adverse impacts for some participants. There are many issues that need to be addressed, including: the stringency of targets and timetables, the nature of the cap (intensity-based or absolute emission reductions) and a safety valve; sources, sinks and GHGs covered; allowance distribution, treatment of new entrants and opt-in provisions; offsets; monitoring and verification; and compliance issues (banking, borrowing, penalties and enforcement). If other programs would inhibit the ability to use offsets or adversely affect domestic markets, it is not crucial. What is crucial is to allow US companies to take credit for international actions within the domestic program.

Question 3. International Linkage
American Iron and Steel Institute

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

For reasons stated above, we do not believe a cap-and-trade system is an advisable approach to address climate change concerns. However, if one is established in the U.S., it should be fashioned in a manner best suited to the U.S. economy. Experience in the EU and in Canada illustrate both the complexities and inequities of imposing such a system and the U.S. should not strive to make its system, if there is one, compatible with approaches that are replete with problems. Allocations established in Europe have favored the power industry and are causing energy-intensive industries such as steel to question their ability to survive under the EU framework. Carbon prices under their trading system have increased far above levels anticipated when the system was established. In Canada, the government has capped the price of carbon, which helps to limit exposure to industries subject to allocated reductions but sets up an artificial system that is not truly market-based and imposes costs on government that may be unaffordable or unacceptable to the public.

Because we do not think a U.S. system should be linked to other systems in place around the world, we have no responses to Questions 3a-3c.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Question 3. International Linkage
Submitter's Name/Affiliation: Robert Shults/APX, Inc.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

APX recommends that the Senate Energy and Natural Resources Committee (Committee) take a leadership role in the development of a market-based greenhouse gas regulatory system that can allow trading with other greenhouse gas cap-and-trade systems worldwide. It is our contention that the globalization of business demands that any system contemplate the eventual development of a worldwide greenhouse gas market. The best way for the Committee to limit the impact on the United States economy; and to encourage comparable action by other nations that are major trading partners is for the Committee to acknowledge the need for a broader market and lead the effort to facilitate the market in a manner which is consistent with the best interest of the United States. Ignoring the broader market for a greenhouse gas system will only result in the evolution of a world market that may be incompatible with the United States system or more costly to the United States economy.

Question 3. International Linkage
Submitter's Name/Affiliation: Robert Shults/APX, Inc.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

    - The U.S. is likely to be the largest greenhouse gas market in the world. By developing a robust regulatory system that can allow trading with other greenhouse gas cap-and-and trade systems, the U.S. has an opportunity to be the leader in this market. With a leadership position, the U.S. will be well positioned to drive the evolution of greenhouse gas markets worldwide.

    - The comparable cost of ignoring worldwide market momentum would likely have a much more significant long-term impact on the U.S. economy than the up front difficulties of designing a market that would be able to evolve into a "linked" international market. Furthermore, the regional nature of the current greenhouse gas regulations in the U.S. has led to significant costs and uncertainties to U.S. corporations. Globalization of business will continue to put pressure on markets to deliver fungible products across a broader region. Balkanization of the greenhouse gas markets will, we believe in the long-run, drive up costs to consumers and businesses in the same manner that the regional markets within the U.S. have led to confusion and uncertainty for those impacted.

Question 3. International Linkage
Submitter's Name/Affiliation: Robert Shults/APX, Inc.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

    - The key attribute for enabling linkage to other systems is the development of a flexible baseline model. APX recommends the creation of a certificate-based central system.

    - The U.S. has an opportunity to lead in this area. If the system is designed in a manner in which the products can be well understood and standardized across a broad range of regions, other nations will choose to understand and work with the larger U.S. market design. It is essential that a proper underlying architecture be put in place that enables the inclusion of external regions, if and when the regulations evolve to a stage where external markets can be linked to the U.S. market.

Question 3. International Linkage
Submitter's Name/Affiliation: Robert Shults/APX, Inc.

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?
    - There should be a central organization within the U.S. to work with other regional markets. APX is not prepared to elaborate on the structure or composition of this organization.

Question 3. International Linkage

Submitter's Name/Affiliation:
Lisa Jacobson, Executive Director, Business Council for Sustainable Energy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

To ensure lowest cost compliance with a global environmental challenge, a U.S. greenhouse gas regulatory system should permit trading amongst other credible greenhouse gas cap-and-trade programs. Further, allowance trading markets should be linked to help ensure as level a regulatory playing field as possible for U.S. firms. Due to competitiveness concerns and the need to access lowest cost reductions, it is critical that linkages with other greenhouse gas trading programs are established at the start of a national program.

Question 3. International Linkage
Submitter's Name/Affiliation:
Lisa Jacobson, Executive Director, Business Council for Sustainable Energy

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Linkage should be based on a comparable environmental commodity, based on allowance transactions that are transparent and verifiable. Appropriate accounting systems and enforcement mechanisms will be required to facilitate the transfer of credible allowances, offsets and other greenhouse gas-related products. U.S. experience with Clean Air Act Emissions Markets, U.S. energy disclosure laws and other environmental commodity trading markets offer the foundation for a U.S. accounting system that would be able to link with non-U.S. trading programs.

Question 3. International Linkage

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

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Linkage with other established greenhouse gas cap (GHG) and trade systems is critical to drive cost effective mitigation and investment. It will provide for the deployment of technology in a cost effective manner. Climate change is a global issue that requires a global response.

While complexities exist to link existing and future GHG cap and trade systems, BP believes that a thoughtful policy to link with other systems over a defined time period is achievable.

Real management of GHG emissions can only occur with accurate quantification. BP supports efforts to create internationally accepted oil & gas emissions protocol and an internationally accepted oil and gas emissions estimation methodology. As GHG quantification programs become increasingly sophisticated, they need to address the unique complexities and commonalities of different sectors with specialized sector protocols. We support the development of industry specific GHG emission protocols (see IPIECA Guidelines for Reporting GHG Emissions) that will be a necessary first step in any national or international GHG trading system.

Question 3. International Linkage
Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

Clarifying Question 3a:

- *Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?*

Yes. GHG emissions are a global issue—and a global response is required. The benefits of linkage with other trading systems outweigh the complexity associated with including them. Linkage will provide a larger market, increased liquidity and the ability to leverage the benefits of abatement options across industries and countries. A well designed system will provide for the lowest compliance cost options.

Question 3. International Linkage
Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

Clarifying Question 3b:

- *If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?*

The adoption of sector specific methodologies, protocols, and compliance mechanisms is a necessary first step in the process of linking systems with other countries. The potential linkage process is a political one, and should be decided by governments with consultation from business. As a starting point, governments and industry should be encouraged to adopt common protocols (e.g. WBCSD/WRI GHG Protocol) for reporting and verifying emissions; this is a foundation of any emissions trading system. Industry, trade associations and governments should work together to strike a balance between flexibility and cost effectiveness in accounting and reporting, and the need for consistency and accuracy.

Question 3. International Linkage
Submitter's Name/Affiliation: Ralph Moran/BP America, Inc.

Clarifying Question 3c:

- *What sort of institutions or coordination would be required between linked systems?*

Linkage with other systems will require the negotiation of international agreements to ensure mutual acceptance and validity of verified reductions. Details of how this is best structured are the responsibility of governments.

Question 3. International Linkage
Submitter's Name/Affiliation: Caiteur Group

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

The U.S. greenhouse gas (GHG) cap-and-trade system should absolutely be designed to allow for trading with other GHG mandatory greenhouse gas cap-and-trade systems around the world. Increasing the potential size of the U.S. carbon credit trading market by including other international systems should help to drive costs down for the U.S. by increasing participants and the pool size for emission allowance, credits and offsets.

In addition we propose two further overarching implementation recommendations for the U.S. program with regard to trading system linkages as follows:

We recommend a **mandatory-to-mandatory system approach** for the U.S. GHG program since regulated programs offer traceability, controls, audit trails, governance and quality standards that may be lacking in non-regulated, voluntary systems. The proposed Canadian Large Final Emitter (LFE) system and the European Union Emissions Trading (EU-ETS) system arising under the regulations of the Kyoto Protocol would therefore meet the criteria.

We are also recommending that the U.S. GHG program support the premise that **a carbon credit should be seen as a new financial currency or instrument** in world trading markets that should be fungible and liquid, with low transactions costs. Linkages to international trading programs are essential to achieving this.

See further supporting information from a GHG trading program linkage implementation perspective on benefits, linkage determination criteria, and institutions and coordinating activity including data linkage requirements in Clarifying Questions 3a, 3b, and 3c.

Special Note: U.S. State Level GHG Programs Linkage and Consolidation

In addition to linking with other GHG trading systems being put in place around the world, we wish to draw attention to the need to link or fold proposed U.S. state-level cap-and-trade programs into a national U.S. GHG trading program. These include the Regional Greenhouse Gas Initiative (RGGI) by the seven Northeastern states that is set to launch in January 2009 and other initiatives in the Southwestern states that are in various stages of proposal and consultation.

Question 3. International Linkage
Submitter's Name/Affiliation: Caiteur Group

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

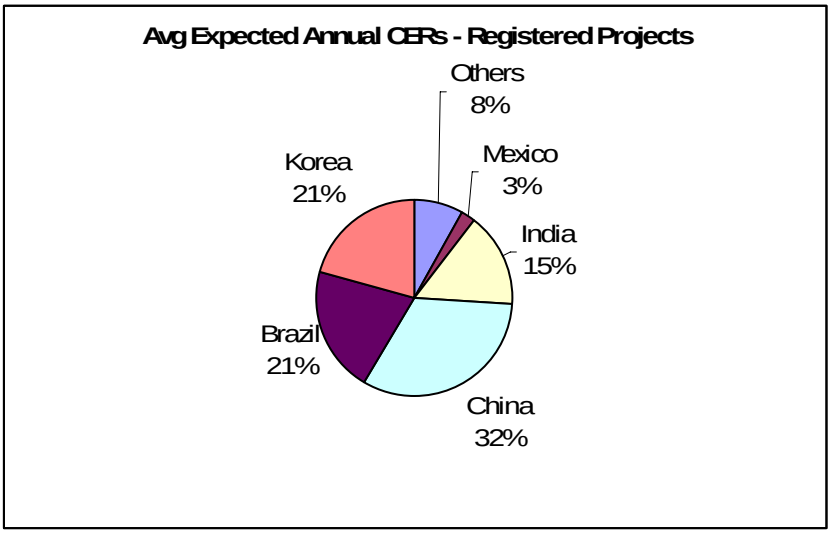
We believe that the potential benefits of leaving the door open to linkage outweigh the potential difficulties. Furthermore a well planned U.S. GHG cap-and-trade system that is initially developed with linkage in mind will mitigate the difficulties encountered by linking. This includes a data strategy that will capture the information requirements of each global cap-and-trade system that the U.S. program links to.

Assessment of Benefits of Linking to Global Cap-and-Trade Systems

The benefits of linking to global GHG trading systems include:

- Potentially lower compliance costs to U.S. companies through the use of low cost credits available from the Clean Development Mechanism (CDM) projects. Especially credits from India, China, and Brazil which together now account for 68.5% of the credits from currently registered CDM projects. According to World Bank and UNFCCC projections based on past experience developing country credits are expected to cost **US$1 to US$4** (i.e. cost to reduce one ton of emissions) compared to **US$15 to US$100** for credits produced in developed countries.

- Greater liquidity and flow-through in the U.S. GHG trading markets for allowances, credits, and offsets where allowed.



Source: UNFCCC CDM data for currently registered projects

Question 3. International Linkage
Submitter's Name/Affiliation: Caiteur Group

The pool of low-cost credits from global trading programs, particularly CDM is huge. The U.S. GHG program cannot afford to ignore the cost savings and liquidity to U.S. capital markets that such a linkage would entail.

As a point of reference, as of March 2006 the UNFCCC CDM program reported the following:

139 CDM projects registered, with 270 million projected CERs produced before end of 2012 (with 50.5 million CERs average expected annually, see attached chart for annual average CERs by host country)

630 total projects in CDM pipeline, with 800 million projected CERs produced by 2012

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Criteria for Determining Whether to Link

The process to determine whether to link with another cap-and-trade system should be based on meeting the following criteria:

- Is the cap-and-trade system based on a mandatory GHG program? As noted above we are recommending a **mandatory-to-mandatory system approach** for the U.S. GHG program since regulated programs offer traceability, controls, audit trails, governance and quality standards that may be lacking in non-regulated, voluntary systems. The proposed Canadian Large Final Emitter (LFE) system and the European Union Emissions Trading (EU-ETS) system arising under the regulations of the Kyoto Protocol would meet the criteria.

- Is the trading system's allowance and credits verifiable, traceable and credible? Validity and recognition of allowances and credits is necessary for U.S. companies to be able to openly trade on a national and global scale. In addition credibility and proper verification of credits reduce the risk of trading credits that are not tied to real emission reductions.

- Is the trading system's credits (and allowances where applicable) sufficiently fungible and liquid for open trading? As noted above we are also recommending that the U.S. GHG program support the premise that **a carbon credit should be seen as a new financial currency or instrument** in world trading markets.

If the cap-and-trade system is compatible with these criteria then the U.S. should link with the system.

Linkage Implementation Criteria – "How to" Process

- Ensure <u>full bi-directional linkages</u> and not one-directional linkages. Hence the U.S. should apply for recognition of credits of its program credits under the Kyoto Protocol. This allows U.S. companies use international credits and in turn to trade credits earned in the U.S. on the international GHG trading markets.

- Leverage the CDM credits system already available instead of pursuing independent U.S. programs to generate credits in developing countries such as China or India. This greatly reduces administrative burdens and costs to the U.S. program.

- Ensure full linkages to CDM tracking systems, specifically the UNFCCC ITL database. See the *Data Management and Tracking* section in 3c below for more details.

Question 3. International Linkage
Submitter's Name/Affiliation: Caiteur Group

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

The institutions and coordination required include:

- U.S. national and international standards bodies, capable of establishing and implementing information and technical standards for participation.

- Detailed coordination between information and systems for data capture and traceability of GHG credits and trading activities. This is particularly true for linking to the CDM International Transaction Log (ITL) credit registry system.

Implementation of Data Management and Tracking with Linked Trading Systems

The U.S GHG program will need to consider the data management and tracking mechanisms necessary for linking a U.S. cap-and-trade program with other international programs such as the Canadian LFE and the EU-ETS and for low cost credits from developing countries such as China and India produced under the CDM Certified Emission Reduction (CER) credits program.

The U.S. GHG program must ensure full linkages to CDM tracking systems, specifically the CDM International Transaction Log (ITL) credit registry database. The CDM ITL provides for:

- Data Exchange Protocols. ITL provides specifications for data exchange between national GHG registries around the world and the ITL.

- Transfer of Credits to National GHG Registries. ITL provides for transfer of credits to registries with reconciliation of data.

- Enhanced Reporting. ITL also provides for enhanced reporting and availability of information to national GHG programs, stakeholders, and the general public.

Question 3. International Linkage
Submitter's Name/Affiliation: California Climate Action Registry

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

A U.S. system that is not ultimately linked to other systems will not be successful in mitigating GHG emissions in a cost effective way, and so runs the risk of imposing costs on the economy and consumers without delivering climate benefits. Because no single nation is responsible for the vast majority of world-wide GHG emissions, the effectiveness of any national policy in mitigating climate change will necessarily rely on the collective actions of the international community. Consequently, a federal GHG regulatory system should find ways to include international GHG reduction credits in any domestic market it establishes.

Because GHGs mix in the atmosphere relatively quickly, comparable reductions achieved anywhere in the world will have an equal impact on the environment. Thus, the program design focus should be on achieving low cost reductions. Certainly other countries may have more cost effective reduction opportunities than the U.S. Linkages would allow a U.S. system to take advantage of those opportunities, lowering the overall cost of regulation.

Many low cost reductions will be available in developing countries, so a U.S. system should find ways to link to the developing world and not just existing regulatory programs in developed countries. On the other hand, links to Europe or other developed countries are also necessary to create important efficiencies for companies that operate in multiple jurisdictions. Furthermore, establishing linkages worldwide will help avoid concerns of competitiveness and leakage. A domestic regulatory program that imposes costs that are out of step with costs imposed in other markets around the world will hurt the competitiveness of U.S. companies and also provide incentives for emissions off-shoring—finishing products or energy generation outside the U.S..

Establishing linkages will not be without challenges. Successful linkage will be most likely among similar systems (in terms of sectors included, stringency of targets, points of regulation, etc.). One of the most fundamental features necessary for creating similar systems capable of being linked is standardizing GHG measurement and reporting protocols. Similarity in measurement and verification will not only lead to a common currency but will promote comparability and also avoid discounting across different countries and different sectors.

Since its inception the Registry has worked diligently to establish consistent GHG standards on a regional, national and international basis. Additionally we have devoted considerable energy to leading the way in harmonizing approaches to third party verification. We hosted several workshops on "creating a common currency" at our annual conference, which generally draws significant international attendance, and have participated in many more. We have also worked to ensure that emission reporting initiatives within the U.S. are consistent. We have collaborated with the Regional Greenhouse Gas Registry in the Northeast since its beginning and as a result we both employ measurement and reporting approaches that are fundamentally consistent. We

are presently working on analogous efforts with several western states and exploring the idea of creating an accounting standards board with both these groups of states. This is the type of institution that might ultimately be necessary on an international basis. We have also recently initiated an effort to collaborate with Mexico in order to develop and promote consistent emission reduction accounting, which could ultimately provide a basis for incorporating offsets from Mexico into any California or U.S. regulatory system.

Question 3. International Linkage
Submitter's Name/Affiliation: Center for Clean Air Policy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Climate change is a global problem that requires a global solution. Linkages across systems are needed to encourage the most cost-effective control strategies. There is the potential for such linkages to benefit the US to the extent that lower cost opportunities are available elsewhere. Advantages to US industry from linkages may include greater liquidity and greater certainty in the availability of allowances at a prevailing international market price.

Question 3. International Linkage
Submitter's Name/Affiliation: Center for Clean Air Policy

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Linking of trading systems will be critical in the long-run for achieving deeper mitigation targets. However, there are important benefits even in the near- and medium-terms, including market liquidity, certainty in the availability of allowances, and the ability to take advantage of lower cost mitigation opportunities in developing countries.

Question 3. International Linkage
Submitter's Name/Affiliation: Center for Clean Air Policy

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Due to restrictions within the Kyoto Protocol, it will not be possible for the US to fully link with the European Emissions Trading System or to other Kyoto country systems through 2012. US allowances would not have value in these systems, though purchases could be possible. Early linkages would be possible with Australia.

Going forward (post-2012), the key question for successful linkages that maintain the integrity of a US program is comparable stringency. This means that targets are set to achieve real and "equivalent effort" reductions from projected business-as-usual levels, that programs have comparable monitoring, reporting and verification requirements as well as comparable rules for data quality and mandatory reporting.

A review of another program could lead to a definitive yes/no decision on whether or not that system should be a trading partner. Alternatively, a program review could result in an appropriate discount factor (or multiplier). For example, allowances from a trading system deemed to be 75 percent as good as our own would be valued at 75 percent of a full allowance. In this way, it would be possible to maximize liquidity while adjusting for real differences in program quality.

Question 3. International Linkage
Submitter's Name/Affiliation: Center for Clean Air Policy

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

All that is required is recognition of allowances from other systems. Ideally, the trading partner would reciprocate and recognize allowances from the US.

Question 3. International Linkage

Submitter's Name/Affiliation: Paula DiPerna, Chicago Climate Exchange, Inc.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Chicago Climate Exchange applauds the recognition by the Senate that this is an important environmental and economic issue. The ability to trade with other greenhouse gas cap-and-trade systems should be an eventual goal of a U.S. system.

Due to emergence of the Chicago Climate Exchange and its European Climate Exchange subsidiary, international carbon market linkages involving U.S. entities are to a significant degree already in place. Expanding such linkages makes optimization of emission management on a global basis easier for international entities, which constitute a major portion of the U.S. economy. Given the global nature of the environmental issue, a greenhouse gas emission reduction system that allows international flexibility and encourages and credits reductions of emissions anywhere in the world would offer the long-term least-cost mechanism.

International linkages of the carbon market expand the breadth of efforts to reduce global emissions, expand and foster international business relations and help deepen positive social interaction. Importantly, carbon market linkages can expand the range of opportunity to realize financial benefit for U.S. entities that cut and offset greenhouse emissions.

Chicago Climate Exchange has already achieved several forms of international linkage through:

- A CCX subsidiary, European Climate Exchange ("ECX"), is by far the busiest central trading and clearing mechanism in the European Union Emissions Trading Scheme.
- Pursuant to CCX rules allowing inclusion of emission sources located in Canada and Mexico by corporates based in the U.S., several CCX Members have included emissions from facilities in those countries in their CCX commitment.
- CCX now includes Canadian entities (e.g. Manitoba Hydro, Abitibi Consolidated)
- CCX includes emissions of the following industrial entities in Brazil in accordance with CCX's standard baseline, auditing and emission reduction schedules:
    - Aracruz Cellulose
    - Klabin S.A.
- CCX includes emission offset projects from locations throughout the western hemisphere, with projects in additional locations now under consideration.
- CCX allows use of Certified Emission Reductions from the Clean Development Mechanism as acceptable in demonstrating compliance.
- Additional CCX international linkages are in development.

Question 3. International Linkage

Submitter's Name/Affiliation: Paula DiPerna, Chicago Climate Exchange, Inc.

In addition, many Chicago Climate Exchange members are international entities that currently operate in more than one greenhouse gas emission reduction and trading program.

The following entities are participants in both the CCX and EU markets:

DuPont
Baxter Healthcare International
Ford Motor Company
Bayer Chemical
Stora Enso
International Paper
Dow Corning
IBM
STMicroelectronics
Bayer Chemical

In addition, numerous trading firms, such as TradeLink and Calyon, are active traders in both the CCX and ECX carbon markets.

Other elements of existing carbon market linkages are:

- CCX Members and European entities use similar emission quantification and audit procedures
- CCX and ECX members use the electronic trading platform (see below)
- CCX and the European Market both allow use Certified Emission Reductions from the Clean Development Mechanism as acceptable in demonstrating compliance

Development of linkages is well under way, and should be an element of any legislative efforts that Congress may choose to adopt.

Question 3. International Linkage
Submitter's Name/Affiliation: Paula DiPerna, Chicago Climate Exchange, Inc.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Yes. The benefits are significant, and the difficulties are not.

Question 3. International Linkage
Submitter's Name/Affiliation: Paula DiPerna, Chicago Climate Exchange, Inc.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

(No answer provided.)

Question 3. International Linkage
Submitter's Name/Affiliation: Paula DiPerna, Chicago Climate Exchange, Inc.

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Required conditions are mutual recognition agreements and linkages of emission allowance databases. Neither of these institutions need to be complex.

As a general matter, good practice for harmonizing programs would include similarity of measurement and reporting procedures and true-up schedules.

Question 3. International Linkage
Submitter's Name/Affiliation: John Stowell/Cinergy Corp

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

A unilateral U.S. cap-and-trade system that is not part of a scientifically sound, economically rational, and politically pragmatic international agreement will ultimately exhibit costs to the U.S. economy that are much less than benefits. The global commons nature of the climate change problem guarantees this. Hence, it is important to think of how the U.S. could be linked with an international program. On the other hand, linking with problematic elements of programs in other countries, such as CDM projects, would achieve nothing and would destroy the environmental integrity of the U.S. system.

Thus, although in the long term, it would be beneficial to link with other countries' GHG cap and trade systems, in the near term, this could lead to severe problems, particularly if it would require compromising on key design components of a US system.

As an example, the White Paper does not discuss the issue of a Safety Valve, but this is a critical element of a well designed program that could make linkage with the European program problematic. Having said that, the benefits to be gained from a Safety Valve (increased cost effectiveness, the elimination of extreme volatility, insurance against a surprisingly high CO2 price environment with attendant economic shocks) far outweigh the benefits of linkage.[1]

Linkage issues can likely be overcome once the Safety Valve escalates to the level above the market price for allowances (market price below Safety Valve). Having said that, it is not clear what impediments there would be to bilateral agreements whereby the US could purchase offsets from other countries, such as China or India, outside the principal multilateral agreements. For example, perhaps a US based utility could pay a Chinese electric generator to install capture and sequestration technology on a Chinese plant. The US firm should then be able to claim the CO2 sequestered via credits – this would be the equivalent of installing a "virtual CO2 scrubber" on one of their US based plants. These credits, to be economically attractive, should not be subtracted from the US baseline, i.e., they should be added to or supplemental to the level of the economy-wide cap. But such project-by-project offsets inevitably raise all the well-known problems that come with the unobserved and fundamentally unobservable baseline associated with deals with individuals, firms, or nations that are not subject to a cap-and-trade regime.

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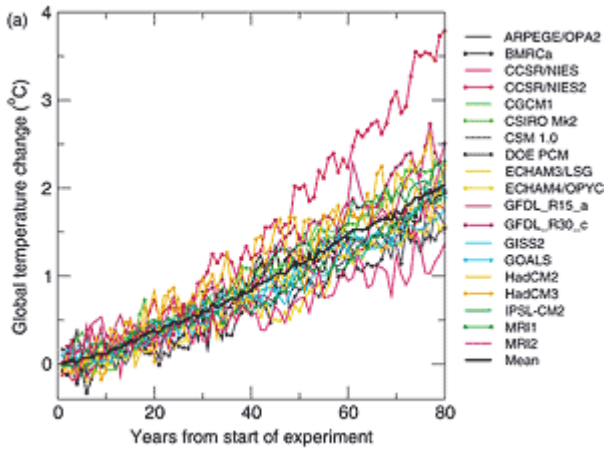
[1] Linkage is really only valuable provided it allows access to lower cost emission reduction opportunities than those available in the US market.

Question 3. International Linkage
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Please begin your response HERE. (no page limit) Again, CEI views a carbon tax as superior to cap-and-trade, assuming *arguendo* that Congress decides to suppress carbon-based energy use. Lawmakers should not lock the United States into policy decisions they may later regret. Taxes are a purely domestic matter and can be repealed without negotiating with foreign powers. A trading scheme would more easily entangle the United States in multilateral institutions created by the European Union (EU) and/or the Kyoto Protocol. Indeed, once a domestic cap-and-trade program is in place, some firms would aggressively lobby for U.S. participation in the Kyoto and EU systems in order to expand their opportunities to buy and sell emissions credits. Repealing taxes is hard but far less so than de-ratifying a treaty or disengaging from multilateral institutions.

Senators Domenici and Bingaman believe global warming to be one of the great threats facing mankind. Science does not support this view. Nearly all climate models predict that, once global warming from greenhouse gas emissions starts, it continues in a constant, not an accelerating, rate. (See Michaels et al. 2002. Revised 21st Century Temperature Projections. *Climate Research* 23:1-9.) Although different models predict different absolute amounts of warming, when their projections are plotted on a graph, the slope in almost every case is linear rather than exponential, as shown in the figure below (IPCC: *Climate Change 2001: The Scientific Basis*, p. 537). The only model to break the "consensus" and predict an accelerating rate of warming is the Canadian Climate Center model, which by sheer accident served as a key basis for the Clinton Administration's "national assessment" report on U.S. climate variability and change. But I digress.



Question 3. International Linkage
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

The linear form of most model projections implies that the amount of future warming can be known to a relatively high degree of certainty. All one needs to do is make a linear extrapolation from the observed rate of warming. Since 1976, the planet's surface has warmed at a remarkably constant rate of 0.17ºC per decade (IPCC, *Climate Change 2001*, p. 115). Consequently, if the "consensus" of climate models is correct, we may reasonably anticipate about 1.7ºC of warming during the 21st century.

Congress (or rather the nation's taxpayers) has spent billions of dollars on climate modeling research over the past 20 years. Unless that investment was a colossal waste, in which case climate models are still too primitive to guide policymaking, we are driven to the conclusion that alarm about global warming is not scientifically justified.

Now suppose a future Congress examines the climate model "consensus" in favor of linearity, draws the obvious inference from the observed rate of warming, and concludes that spending trillions of dollars to mitigate a modest warming by a few tenths of a degree makes no sense. If so, repealing a carbon tax will be politically more feasible than disengaging from treaty obligations or international trading mechanisms.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Please begin your response HERE. (no page limit) Opening the door to linkage is a peril to be avoided. See the previous answer.

Question 3. International Linkage
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit) Linkage is not desirable, because it dramatically increases the political difficulty of rescinding carbon suppression policies. See above.

Question 3. International Linkage
Submitter's Name/Affiliation: (Marlo Lewis/Competitive Enterprise Institute)

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Conectiv Energy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Question 3. International Linkage
Submitter's Name/Affiliation: Conectiv Energy

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

There is no question that designing a greenhouse gas trading program with a workable international trading component is a major challenge considering the significant differences that exist in governmental institutions and regulatory systems. Nonetheless, Conectiv Energy is strongly in favor of international linkage because of the potential benefits such a program would offer. The White Paper acknowledges one of these benefits when it states on Page 13 that *"…numerous studies have shown that a trading system that includes emission reductions in key developing countries such as China and India will have significantly lower costs than a system that excludes these low cost reductions."*

Aside from the obvious cost benefits provided by international linkage there are at least two additional benefits. The first has to do with the near-term reductions that can be achieved using current technology. Although current technologies provide some options for lowering emissions, new technologies are needed to stabilize greenhouse gas (GHG) emissions. Therefore, any trading scheme that does not allow for offsets between the U.S. and developing countries will result in significantly lower near-term reductions compared to a program that allows such offsets. Since the beneficial effects of GHG reductions are felt equally regardless of where they are made, it is in everyone's interest to not only allow offsets, but to actively encourage them. Doing so will maximize near-term reductions in GHG emissions, while allowing time for research & development activities to produce the technology breakthroughs that will be needed to achieve continuing reductions in the long term.

The second additional benefit of international linkage, in Conectiv Energy's view, is that of enhancing market liquidity. Liquidity in a trading system is a key ingredient to ensuring a viable market approach. Without sustained liquidity the market will generate improper pricing information, which would discourage participation. Linking a U.S. cap and trade system to similar systems in other countries will increase liquidity by increasing the number of market participants.

In summary, Conectiv Energy believes that any future GHG program should be designed to accommodate linkage with other trading programs, thereby allowing for offsets between U.S.-based sources and those in other countries where reductions may be obtained at a lower cost.

Question 3. International Linkage
Submitter's Name/Affiliation: (Congressional Budget Office)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Because emissions from anywhere in the world make the same potential contribution to warming, a mitigation program would minimize the costs of meeting any particular goal by placing the same price on emissions everywhere. Thus, if policymakers were to adopt cost-effectiveness as a guiding principle in controlling emissions, they would want to ensure that emission prices would be equalized across countries. One way to accomplish that goal would be to allow for the trading of emission credits or rights across international borders.

Nevertheless, international trading could raise or lower the domestic price of emissions and the overall costs of the domestic program, depending on what set of countries was included in the system and the relative stringency of participating countries' domestic programs. For example, if trading only involved developed countries, each with an emission target that required similarly proportionate reductions in baseline emissions, emissions trading would be likely to raise prices in the United States, benefiting owners of domestic emission credits but hurting fuel users. In contrast, if a trading system included developing countries such as India and China, and those countries had targets consistent with their projected baseline emissions, emissions trading could result in a dramatic decrease in the emission price in the United States.[27]

Further complications would arise if cap-and-trade systems in different countries had dramatically different rules. Significant variations among systems would be likely to significantly increase monitoring and enforcement costs. Even more complications in monitoring and enforcement would arise if a domestic trading system allowed for regulated entities to earn credits by sponsoring emission-reducing projects in countries that did not have any targets at all. Further, countries' ability to ensure that their emission target would be met could be limited if any participating country's system incorporated a safety valve, or limit on the maximum price, and if regulated entities in other countries were allowed access to credits available at the safety-valve price. For example, if the clearing price for emission allowances necessary to meet the cap in the European Union trading program was higher than a safety-valve price included in a U.S. trading program, then European firms could comply by purchasing U.S. allowances. If that was to occur, the emissions cap in the EU program would not be met.

27. See Congressional Budget Office, *The Economic Costs of Reducing Emissions of Greenhouse Gases: A Survey of Economic Models* (May 2003), p. 82.

Question 3. International Linkage

Submitter's Name/Affiliation: (Insert your Name/Affiliation here)

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Question 3. International Linkage
Submitter's Name/Affiliation: (Insert your Name/Affiliation here)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: (Insert your Name/Affiliation here)

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: (Insert your Name/Affiliation here)

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: (Insert your Name/Affiliation here)

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

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Question 3. International Linkage
Submitter's Name/Affiliation: Skiles W. Boyd/DTE Energy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Generally, it is expected that the broader the scope (the number of players), the greater the opportunity for cost efficiency and the hope for minimal disruption of the U.S. economy. However, there is no uniform international program today. Rather than compromise a U.S. program by trying to provide for linkage to existing international programs, the U.S. should establish the model for others to follow.

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

Question 3. International Linkage
Submitter's Name/Affiliation: Michael Parr, DuPont

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Question 3. International Linkage
Submitter's Name/Affiliation: Michael Parr, DuPont

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

It is crucial that any domestic GHG control system be designed to be as economically efficient as is reasonable while taking account of the differing sectoral price sensitivities and elasticities we have discussed elsewhere in this response. The global economy needs to be able to seek the lowest cost reductions consistent with achieving the overall level of reductions needed in an economically sustainable fashion. The issue of global climate change is such that the locations of any given emissions or reductions are immaterial; it is the net reduction that matters. GHG reduction systems also need to encourage the kind of technology transfer necessary to achieve the needed global reductions. In particular, as the greatest growth in global GHG emissions will occur in the rapidly developing economies of China and India any US system needs to be designed in a fashion that encourages those nations to participate in a global program and to allow reduction investments to flow to those economies.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael Parr, DuPont

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Expanded global market access has resulted in significant gains in economic efficiency in numerous areas in recent decades, including retail goods, information technology and manufacturing. There is no reason that the significant economic challenge of addressing global climate change should not also benefit from the efficiencies of such broad market access.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael Parr, DuPont

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Any US GHG reduction program should help to forge the development of a generally consistent global framework for climate change programs that would allow for efficient reductions and trading across nations. The consistency of any given national or regional program with the framework could then guide linkage decisions. The framework would address matters such as documentation of reductions and ownership of credits.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael Parr, DuPont

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
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.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

For the purposes of the following discussion, we define linking to mean that there is reciprocity among the systems, allowing for the full and unfettered trading of reduction credits.

In discussing whether a U.S. mandatory GHG trading program should be designed to allow for trading with other similar systems in place around the world, it is important not to divorce the discussion from a safety valve feature. **A safety valve should be instituted, even at the cost of linkage with other systems, since it would yield the far more important benefit of cost certainty.** Any mandatory cap-and-trade program established in the U.S. could have both features: a safety valve and linkage with other systems, provided that those other systems were based on the use of offsets. Linking with other trading systems alone, without a safety valve, could not offer cost certainty and might not offer relief from rising compliance costs of a domestic regime. The discussion below on interlinkages is overlaid with the assumption that a

safety valve feature is instituted; if that cannot be accommodated, then linkage should be avoided.

The White Paper highlights the benefits of including low-cost emission reduction opportunities in "key developing countries such as China and India," stating that such a system "will have significantly lower costs than a system that excludes these low cost reductions" (p. 13). However, these benefits could be more easily captured through provisions allowing for **offsets** for a wide range of project activities in such countries, and making these offsets additional to the initial allocation pool. This would have the effect of expanding the pool of available mitigation activities available below the safety valve price, and would likely spur the actual undertaking of projects instead of the purchase of reduction allowances. The U.S. should be able to avail itself of CDM credits or other international offsets even without formal linkages with foreign trading systems.

As noted earlier, linkage of similarly structured programs would be expected to yield economic benefits by increasing the size of the allowance pool and the number of participants. There are a number of issues that need to be addressed in a similar fashion for two or more systems to interlink and lead to benefits for the partners involved. These issues include: the stringency and nature of targets and timetables; safety valve; sources, sinks and GHGs covered; allowance distribution, treatment of new entrants and opt-in provisions; offsets; monitoring and verification; and compliance issues (banking, borrowing, penalties and enforcement). However, if not addressed properly, linking systems would lead to adverse impacts for some participants, and could make the achievement of targets more difficult by changing emissions levels. As Erik

Question 3. International Linkage
Submitter's Name/Affiliation: William L. Fang, Edison Electric Institute

Haites and Fiona Mullins noted in their study for EPRI, the International Energy Agency and the International Emissions Trading Association, "Linking Domestic and Industry Greenhouse Gas Emission Trading Systems" (Oct. 8, 2001) at pp. viii, vii-viii:

> When two emissions trading programs are linked, the market price will be higher than the pre-link price in one of the programs and lower than the pre-link price in the other program. This means that buyers in the high price program and sellers in the low price program benefit from the link. Conversely, sellers in the high price program and buyers in the low price program suffer financially as a result of the link. Thus, even though linking trading programs should yield a net economic benefit, some participants may be worse off. In addition, linking programs may highlight differences in treatment of similar firms and create pressure to alleviate the resulting competitive distortions.
>
> Linking domestic emissions trading programs can also change national emissions levels; one country is likely to be a net importer of allowances/credits while the other is a net exporter. This means that actual emissions are below the aggregate emissions cap/baseline in the net exporter country and that the participants in that program earn revenue from the sale of allowances/credits. Conversely, national emissions will be higher than the desired trajectory in the net importer country, which may make achievement of its national emissions limitation commitment for 2008-2012 more difficult. However, the imported allowances/credits reduce compliance costs and may help protect the competitiveness of domestic industry.
>
> Differences in the design of linked programs have the potential to result in higher total emissions, to limit the economic benefits of the larger market, or to raise equity issues. These issues can be addressed, but depending upon the differences between the programs the resolution could be complex and time consuming.
>
> * * * *
>
> Most of these issues [that could complicate links between two or more programs], such as concerns over the effectiveness of compliance enforcement, involve protection of the environmental objective – the combined emissions target of the programs being linked.

There would be ways of overcoming these obstacles. Mutual recognition agreements could be negotiated between regimes to ensure that allowances from both programs are mutually acceptable, which might also include establishment of a standard method for approval of

reduction credits or allowances. The two systems could also rely on commercial mechanisms to link them together.

> In general, the greater the similarity of the programs -- stringency of targets, distribution of allowances/credits, banking provisions, registry structure, etc. -- being linked, the fewer the issues that need to be addressed and the simpler it becomes to negotiate an agreement. This suggests that an agreement to link emissions trading programs is likely to lead to changes to the designs of the programs to increase their similarity. Where design features are not harmonised and have economic value, they will give rise to arbitrage trading.

Haites & Mullins, *supra*, at p. ix.

These points are borne out when examining how a U.S. system would link with either the European or Canadian systems.

- As noted earlier, a key feature of any U.S. system should be a safety valve. This feature, which would act as a price cap for emissions allowances, would hinder linkage with the **European Union (E.U.) emissions trading system (ETS)** since the net effect of the safety valve, if triggered, would create an unknown quantity of allowances at the safety valve price that would be far less expensive than the capped allowances available under the ETS system. As the White Paper states, such "disparities in the stringency of targets and in allowance prices could make linkage politically difficult" (p. 13).

- It is also unlikely that the E.U. would allow interlinkage with such a U.S. system due to the latter's less stringent nature, as exemplified by the E.U. decision not to allow interlinkage with the Regional Greenhouse Gas Initiative (RGGI) developed by seven Northeastern states since the RGGI targets are not as stringent as the ETS targets.

It is also unclear if a U.S. program would want to link with the ETS. The ETS exempts a number of energy-intensive industries, the transportation sector and households, which limits its effectiveness and ensures that it is not economy-wide. It is also unclear if implementation of Phase I of the ETS (under which allocations were based on business-as-usual projections) has done anything to affect emissions behavior in the covered nations, which continue to emit at rates well beyond their targets under the Protocol (see graphic 3 in the Appendix). Later this year, nations subject to the ETS will submit their national allocations plans for Phase II, under which allocations will be far less generous than under Phase I since they will have to match up with the Protocol targets. Several commentators have noted that the ETS is far more costly and complicated than historically successful emissions trading systems, such as the Clean Air Act title IV acid rain program:

> [T]he scope and complexity of the EU program is far greater than past efforts. . . .Table 1 [comparing U.S. SO_x and NO_x programs with E.U. ETS]. . .illustrates several ways in which the scope of the EU program is broader and more complex than past U.S. efforts.
>
> * * * *
>
> [T]he value of the emissions allowances in the EU ETS could be 20 times greater (or more) than those of past trading programs (see Table 1), making the process even more politically difficult.

J. Kruger & W. Pizer, "Greenhouse Gas Trading in Europe: The New Grand Policy Experiment," Environment, Vol. 46, No. 8 at 10, 13, 15 (Table 1) (Oct. 2004), *available at* www.energycommission.org.

Under Phase I, reduction permits have traded at approximately $25/ton of CO_2 for the last year, much higher than anticipated. Realizing that prices will have to rise significantly higher for E.U.

countries to meet their targets, some governments have suggested abandoning the ETS. Thus, linkage with the ETS might not be a desired feature initially in a U.S. program.

The White Paper also suggests possible linkage with the **Canada Large Final Emitter system**. However, this system will likely not be implemented until at least 2008, so it is unclear how it would function and whether it would be desirable to link with such a system. One key question regarding the Canadian system – assuming that it is indeed implemented – is how its price cap would function. According to various reports, the Canadian system will incorporate a price cap of $15 (CAN)/ton of CO_2, so that in the event market prices exceed that price, companies can buy whatever allowances they need at that price. The Canadian government would use that money to purchase CDM or other reduction credits in the market to offset those emissions and help Canada meet its Protocol target. However, allowances in the ETS are currently selling at almost twice that price, and there are no significant pools of CDM credits available from which the Canadian government could buy required reduction credits.

Of course, there is the even larger issue of whether Canada will ignore its Kyoto Protocol target and develop its own "made in Canada" plan, since the Conservative Party – who ran in part on a promise to withdraw from the Protocol – now controls the government.

Question 3. International Linkage
Submitter's Name/Affiliation: Environmental Defense

Question 3. International Linkage
Submitter's Name/Affiliation: Environmental Defense

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Yes. These include, among others:

- Significantly lower economic costs, as a result of access to tons of allowances and offsets in nations where the marginal costs of emissions control and carbon sequestration are much less than in the United States;

- Expanded export opportunities for innovative U.S. technologies and U.S. energy/environmental services expertise;

- Easing the regulatory burden on U.S.-based multinationals, that otherwise would have to comply with several unconnected administrative GHG-limit regimes;

- Broader realization of public health and environmental co-benefits, e.g. from fossil energy emission reduction investments in nations with antiquated technologies and markedly worse air quality or from investments in reducing emissions from deforestation in developing nations where such investments could yield significant biodiversity and watershed benefits.

Question 3. International Linkage
Submitter's Name/Affiliation: Environmental Defense

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

In deciding *whether* to link to systems in another country, the key question is: **Does the linked system meet U.S. minimum elements?** Does the other nation's emissions trading system comprise the essential elements needed to ensure fungibility of traded tons, i.e., to assure emitters and the public that a ton of reductions imported from abroad represents a real ton of reductions, and is, therefore, fully substitutable for a ton of reductions earned in the United States? The essential elements are:

(i) a cap on absolute (total) emissions. As currently constituted, the EU Emissions Trading Scheme (EU-ETS) would meet this criterion. The Canadian Large Final Emitters system would not, since, as currently constituted, it only limits emissions relative to economic productivity, and allows unlimited emissions if the price of traded tons reaches $15 CAN

(ii) a cap set at a level reasonably comparable to that in the United States, taking into account the amount of reductions needed globally to keep open possibilities for averting dangerous climate change.

(iii) reasonably comparable measuring, monitoring, and verification requirements.

(iv) a transparent allowance tracking and registry system to ensure that foreign allowances and offsets cannot be sold twice.

(v) openness of the linked system to "imports" of U.S. allowances and offsets.

Since 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," the following additional criteria should apply:

(vi) the foreign nation should have enacted mandatory legally enforceable requirements that emitters must limit emissions to allowable levels, and should have a transparent and effective domestic enforcement program.

(vii) in the absence of mandatory requirements and effective enforcement, then the U.S. should only allow linkage to the foreign cap-and-trade system after the other nation has demonstrated that it has achieved reductions in its total emissions. This is the model that could be used to encourage nations that wish to address emissions from deforestation in the developing world, a process launched at the Montreal climate treaty talks in December 2005, with the thoughtful participation of Senator Bingaman.

(viii) in the case of a foreign nation that has no cap on emissions and wishes only to sell project-based offsets, the U.S. must apply extremely rigorous requirements to ensure that the offsets represent real reductions (including: a transparent baseline, proof of additionality, demonstration of no leakage, permanence or insurance, and independent third-party verification), as well as serialization and registration, to ensure that offsets have not been sold twice. This is particularly important given the perverse incentive to inflate the baseline for project-based offsets in uncapped countries. Alternatively, the U.S. could only recognize Certified Emission Reductions from the Clean Development Mechanism.

The European Union's Emissions Trading System Linking Directive provides one model for linkage. However, because that Directive is being initially implemented in a way that limits linkage to project-based rather than full emissions trading, it unduly restricts transactions and drives costs up.

Question 3. International Linkage
Submitter's Name/Affiliation: Environmental Defense

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Linking could be readily implemented if: both nations have registries; both nations are trading in similarly denominated emissions "currencies" (CO_2-equivalent, absolute tons); and linkage is approved by national authorities on a transaction-by-transaction basis (not recommended), under a blanket authorization by which national authorities notify their sources that they will accept the foreign nation's allowances if tendered for domestic compliance or under a blanket bilateral agreement such as a mutual recognition agreement (MRA). In the case of an MRA, the MRA should include provisions governing mutual legal assistance in case of need for sharing of data, coordinated inspections, etc.

One key area where a coordinated mechanism must be established is in enforcement. Here the experience of the international accounting profession is instructive. For years, companies faced incompatible accounting standards in different part of the world, and enforcement was lackadaisical or non-existent. In policing GHG emissions and trading markets, a coordinating mechanism involving the EU, the U.S., and probably the rest of the OECD countries plus Russia, China, and India would have to be set up along the lines of the SEC or the IAS organization.

The nations should also have in place an institutional mechanism to ensure that private parties to not "oversell" national allowances and thereby force a nation to breach its national cap. A number of nations are developing "split level" arrangements by which domestic emissions allowances can be converted, with the approval of national authorities, into internationally tradable allowances, with corresponding entries in national registries so as to track compliance with national obligations.

Question 3. International Linkage
Submitter's Name/Affiliation: Richels & Wilson/EPRI

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Climate change is a global issue. The potential benefits of integrating a U.S. trading system with other climate policies, being implemented around the world, are huge – it fosters engagement and cooperation with other countries, it can potentially provide substantial savings in policy cost, and it does not weaken the environmental integrity of a program. Our response in this section highlights our research on the value of international trade.

The gains from international "where" flexibility can be quite large. Numerous studies have shown that global mitigation costs can be reduced substantially by allowing emission reductions to take place wherever it is cheapest to do so, regardless of geographical location. To date, most studies have focused on the Kyoto Protocol, but the results are qualitatively applicable to any approach involving multi-country reductions. The study reviewed here provides an example of the benefits of international trade in carbon emission rights.

The Kyoto Protocol includes several provisions allowing for a limited amount of "where" flexibility. These include emission trading and Joint Implementation (JI) among Annex I countries (OECD and Eastern Europe), as well as a Clean Development Mechanism (CDM) intended to facilitate cooperative emission reduction projects between Annex I and non-Annex I (developing) countries.

One study[1] compared the cost of three scenarios: 1) no international trading, 2) Annex I trading plus CDM, and 3) full global trading. Figure A3-1 in Appendix 3 illustrates the price of carbon emission rights to the United States in 2010 and 2020. In the most constrained scenario (no trading), the United States must satisfy its emission reduction requirements within its own boundaries. In this case, the price approaches $240 per ton of carbon[2] in 2010. In the Annex I plus CDM case, the value drops to slightly less than $100 per ton in 2010. As might be expected, the value of emission rights is lowest with full global trading, falling to $70 per ton in 2010. As the competition for emission rights increases, the price rises.

[1] Manne, A. and R. Richels, 1999: The Kyoto Protocol: A cost-effective strategy for meeting environmental objectives? *The Energy Journal*, special issue (May), 1-23.

[2] Some studies present costs of abatement in dollars per ton of carbon ($/ton C), others in dollars per ton of CO2 ($/ton CO2). Some use metric tons (tonnes) and others use short tons. To convert the figures presented in this response to $/ton CO2, divide by approximately four (e.g., $240/ton C is equivalent to $60/ton CO2).

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

The magnitude of the benefits would depend, of course, on the constraint. However, the example discussed on the previous page provides some insight into the size of the potential benefits. One way to view the costs of abatement is to show losses in terms of gross domestic product (GDP). Figure A3-2 in Appendix 3 displays the results of the analysis for the United States.[3] Losses are higher in the absence of trading, approaching $90 billion in 2010. This is approximately one percent of U.S. GDP. To the extent that trade is introduced, losses decline. Under the most optimistic option (full global trading), losses are approximately $20 billion in 2010. Again, the costs to the U.S. economy increase over time as the competition for emission rights bids up their price.

From Figure A3-2, it is clear that action to limit full where flexibility can entail significant economic costs. This could occur either through limiting the amount of offsets that a country can purchase or by international agreements which exclude some major emitters.

Also, we note that expanding the number of countries participating in an agreement will reduce overall costs, but the individual member costs may go up or down depending upon their relative costs of reductions.

Potential difficulties relate to increased complexity—due to additional regulations needed to implement linkage—and environmental integrity. Since the United States can unilaterally control what purchases are allowable, these environmental integrity issues can be limited. The long-term benefits of international trade, which measure in tens of billions of dollars as noted above, far outweigh these potential short-term difficulties.

[3] Manne, A. and R. Richels, 1999: The Kyoto Protocol: A cost-effective strategy for meeting environmental objectives? *The Energy Journal*, special issue (May), 1-23.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Linkage can be one way, allowing United States entities to use allowances from other systems to count towards compliance; or two-way, providing a full linkage with another trading system. The U.S. can unilaterally control the importation of emissions allowances, thereby controlling their quality. The principal issues will be 1) maintaining environmental integrity (e.g., by linking to systems with comparable monitoring and verification, similar "safety valves", etc.), and 2) minimizing additional transaction costs. There are a large number of details to consider in linking, which have been addressed in detail in a paper jointly developed by EPRI, the International Energy Agency, and the International Emissions Trading Association.[4]

Much can be learned from studying existing systems. For example, in a study[5] of the European Union Emissions Trading Scheme (EU-ETS),[6] the Electric Power Research Institute found that the development of the EU-ETS and its operation to date can provide useful insights for stakeholders that may be involved in the design of any future national or regional greenhouse gas (GHG) emissions trading program. These insights include:

- **Provide clarity, consistency, and adequate lead-time.** Policy makers can reduce market uncertainty and improve functioning of a new GHG emissions trading system by providing adequate lead time for firms to prepare for the start of the program, providing clarity about future regulatory requirements, avoiding different rules across jurisdictions, and making key policy decisions at the beginning of the program.
- **Cover all sectors and gases.** To maximize economic efficiency, increase available GHG abatement options, and reduce compliance costs, a GHG emissions trading program should include broad coverage of economic sectors and greenhouse gases.
- **Include compliance flexibility.** Allowing regulated firms to achieve compliance using "flexible" mechanisms, like GHG emissions reduction "credits" created by the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Implementation (JI) programs, can increase available GHG abatement options and reduce compliance costs.
- **Allow inter-temporal banking and borrowing.** "Banking" and "borrowing" of emissions allowances between compliance periods can provide market incentives for "over-compliance", and can help firms to optimize their operations over the entire time horizon of the trading program.

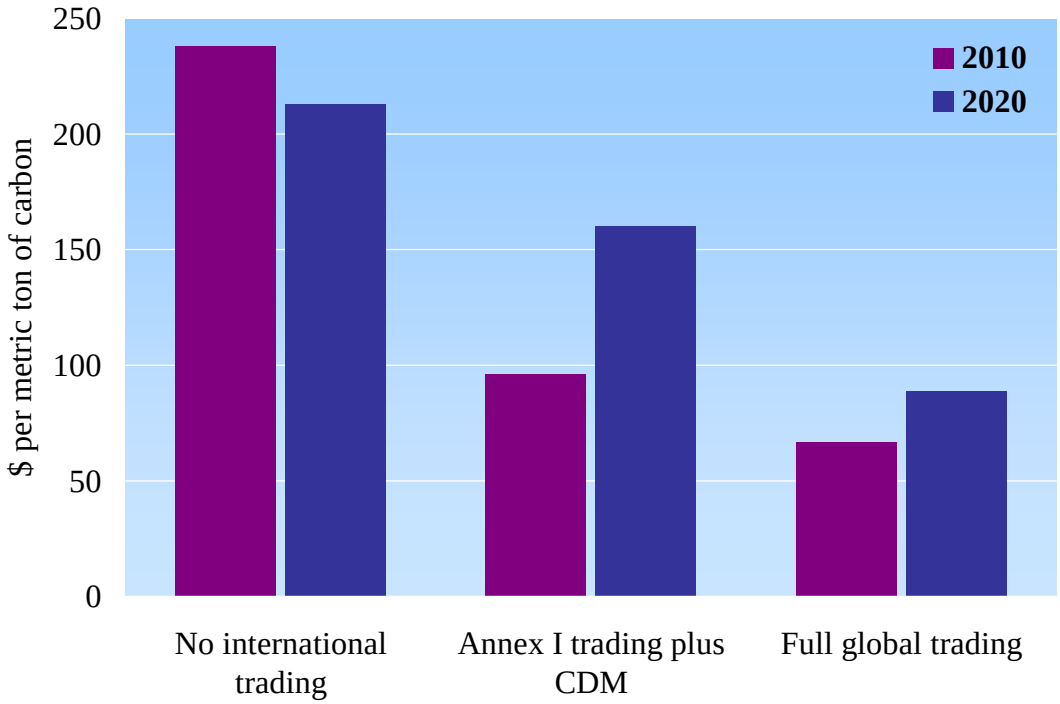
[4] Haites, E. and F. Mullins, 2001: Linking domestic and industry greenhouse gas emission trading systems. Report prepared for EPRI, the International Energy Agency (IEA), and the International Emissions Trading Association by Margaree Consultants.

[5] EPRI (Electric Power Research Institute), 2004: The EU emissions trading scheme: Key issues and future outlook. *Technical Update*, **1009924**, December.

[6] European Commission, 2004: *EU Emissions Trading: An Open Scheme Promoting Global Innovation to Combat Climate Change*. http://europa.eu.int/comm/environment/ climat/pdf/emission_trading2_en.pdf.

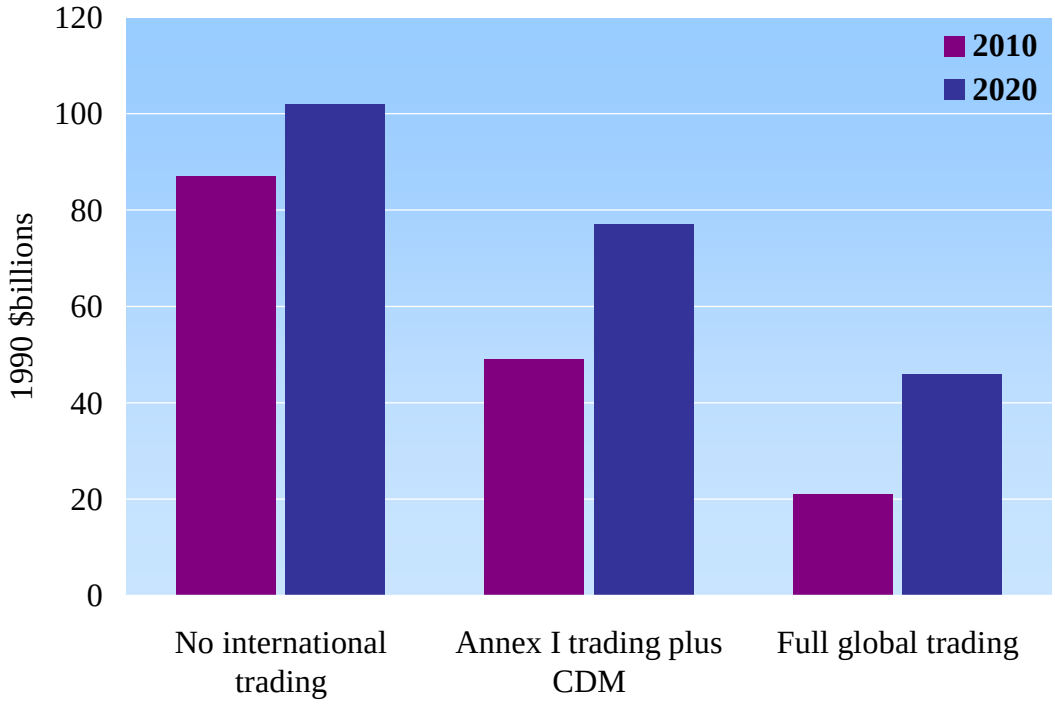
- **Encourage linking.** Linking emissions trading programs to similar programs in other nations and regions, and allowing different kinds of "credits" to be used for compliance purposes, can increase the benefits of emissions trading, but also may require a variety of difficult market design issues to be addressed.
- **Carefully consider incentives that allocations create.** Several EU countries adopted rules that disallow companies from re-allocating EU emission allowances granted to older, less efficient installations that are closed and replaced by new, more efficient ones. This approach should be avoided as it discourages companies from replacing older plants.

Figure A3-1. Incremental value of carbon emission rights in the United States under alternative scenarios for implementation of the Kyoto Protocol.



Source: Manne, A. and R. Richels, 1999: The Kyoto Protocol: A cost-effective strategy for meeting environmental objectives? *The Energy Journal*, special issue (May), 1-23.

Figure A3-2. Annual U.S. GDP losses under alternative scenarios for implementation of the Kyoto Protocol.



Source: Manne, A. and R. Richels, 1999: The Kyoto Protocol: A cost-effective strategy for meeting environmental objectives? *The Energy Journal*, special issue (May), 1-23.

Question 3. International Linkage
John W. Rowe/Exelon Corporation

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Global climate change is a worldwide problem that ultimately will require all nations to take action to reduce greenhouse gas emissions. Exelon believes that it is prudent, therefore, to design a U.S. system that would allow for trading with other nations' greenhouse gas cap-and-trade systems. Any trading of credits between U.S. and other nations' programs should only be allowed in cases where the traded credits are real, measurable, additional, and verifiable. International trading has the potential to allow for lower cost compliance, to the extent that such trading provides access to lower cost credits than are available in the U.S.

Exelon is also supportive of a U.S. program that allows for project-based emission offsets from international sources (in addition to domestic offset sources) provided that the offset projects are real, measurable, additional, and verifiable. Such international offsets could provide lower cost compliance options to regulated entities in the U.S. versus other alternatives.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

As a practical matter, in the short-term, the safety valve approach proposed by the National Commission on Energy Policy provides the U.S. with an assurance that costs of a U.S. climate change program will be contained and managed over time. In this sense, resolution of the international trading question does not need to be answered prior to commencement of a U.S. climate change program and resolution of this issue should not be the basis for delaying action on a U.S. based program.

As previously mentioned, however, longer-term, Exelon believes that the door should be left open to international trading as a potential means of allowing regulated entities in the U.S. to access lower cost international options where they exist. Efficiency and cost-benefits may also accrue to U.S. multi-national companies from international trading to the extent that such companies can work with internationally fungible compliance currencies and manage their U.S. and foreign nation compliance on more of a "portfolio basis," taking the most cost effective actions possible on their operating systems, whether overseas or in the U.S.

Question 3. International Linkage
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

A U.S.-only system may not lead to implementation of cost-effective reductions which have been widely identified and may not have any meaningful impact on global greenhouse gas emissions. An effective program must support international cost-effective reductions and include developing countries. Such a program should consider a variety of design elements necessary to address economic efficiency, competitiveness and compatibility[1].

[1] "Linking Domestic and Industry Greenhouse Gas Emission Trading Systems" Haites, E.; Mullins, F., October 8, 2001, Report prepared for EPRI, the International Energy Agency (IEA) and the International Emissions Trading Association

Question 3. International Linkage
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

The potential benefits of international cooperation through cohesive markets delivering the most expeditious and least cost benefits outweigh the concerns that arise when linking with other trading systems. However, we must have adequate assurance that other countries' trading systems are real, enforceable and permanent.

Question 3. International Linkage
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Climate change is a global issue and requires a global solution. All nations have a responsibility to participate in the solution. Therefore, it is desirable that there be an international market for GHG emission credits. However, just as with other markets, whether financial, commodities or materials, certain factors should be considered and evaluated in international markets before linkage with any domestic market in order to assure effective and fair trading.

- Market power – no single nation should have undue market power which can artificially affect pricing
- Market should be transparent with visible prices for all transactions
- Market should be designed for economic efficiency
- Market should have protections against market manipulation
- Market must have common, agreed-upon standards, controls and enforcement (or dispute resolution) mechanisms
- Must consider impact of constraints imposed by individual nations or blocs on risk to the United States and market effectiveness. (Price caps, baseline years, limitations on use of vintages)
- Market must have agreed-upon protocols for definitions of GHG allowances, verification of allowances and verification of ownership.

Question 3. International Linkage
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Linkage to other countries systems must be preceded by some process to ensure the enforceability of the reduction commitments.

Any linkage to other systems would also have to consider different currency translation and volatilities. This undoubtedly would add additional administration and complexity to system management.

Question 3. International Linkage
Submitter's Name/Affiliation: Daniel V. Steen/FirstEnergy Corp.

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

The most efficient market place would have a single set of rules and a single clearinghouse to manage market transactions. This would not only link the systems but would yield a single market system.

writer for “Business and the Environment”
formerly with Massachusetts Department of Telecommunications and Energy

3. Should the system be designed for international trading?

Absolutely, it should. Many are the opportunities to reduce carbon emissions in other countries more cheaply than can be done here. Such “offsets” should be verified. American rules should not be inconsistent with rules used by other nations.

Question 3. International Linkage
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

- If and when there is a cap and trade system in the US, the answer is yes.

- By connecting with other greenhouse gas trading systems around the world, the United States can achieve the greatest emissions reductions at the lowest cost. Because the location of greenhouse gas emissions is not a factor in their warming impact, a ton of emission reduction in India has the same environmental benefit as a ton of emission reduction in the United States. Yet the costs of achieving that ton of emission reduction may be far less in India than it would be in the United States.

- In addition, by making U.S. investors eligible to utilize credits generated in other countries, the United States can increase investment in emission-reducing projects and promote U.S. exports of environmentally friendly technologies.

- Finally, companies operating in a number of jurisdictions would face lower total costs if they could utilize excess allowances/credits from one jurisdiction for their needs in other jurisdictions.

Question 3. International Linkage
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

Clarifying Question 3a:

Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

- We believe that the benefits described in the previous response would outweigh the difficulties. The benefits will take the form of achieving greater environmental benefits at a lower cost to U.S. industry, and promoting U.S. exports.

- The difficulties may include creating a mechanism to ensure that property rights in emission reductions are acceptable to all parties. However, this challenge would not be unique to the United States, and by the time the United States enacts legislation, the European Union, Canada, Japan and many other nations might already have addressed this issue.

Question 3. International Linkage
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

Clarifying Question 3b:

If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

- The most important consideration in whether or not to link to another country's system should be the degree of confidence in GHG reduction credits authorized by that country. Specific characteristics required would be measures that:

    1. Create a clear property right in the greenhouse gas reductions

    2. Assure that the credits represent actual reductions of greenhouse gas emissions in the volume specified

    3. Document that the seller of credits has exclusive rights to those credits

Question 3. International Linkage
Submitter's Name/Affiliation: Stephen Ramsey/David Slump for General Electric Company

Clarifying Question 3c:

What sort of institutions or coordination would be required between linked systems?

- Linkage between the United States and other systems would probably require bilateral or multilateral agreements to ensure that the systems share the common characteristics outlined in answer to the previous question. This need not be carried out through a permanent body or institution.

Question 3. International Linkage
Submitter's Name/Affiliation: John Coequyt / Greenpeace US

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

A domestic trading system will be a powerful mechanism by which the United States can demonstrate its seriousness in tackling global warming. A trading system that is fully compatible with the emerging Kyoto system and with the European Union trading system would allow U.S. enterprises to fully capture the economic benefits and efficiency of access to an efficient global market. It would also permit the United States to regain its leadership on this issue: the Kyoto architecture is American architecture and represents a huge intellectual investment by U.S. companies, government and experts over more than a decade. A global trading system of which the United States is a part is the most obvious vehicle to draw in the large scale involvement of the large emitters in the developing world through the development of new innovative mechanisms such as national sectoral caps with no lose targets as an initial entry point. It is essential that the domestic trading system be compatible with the other national and international trading systems.

To facilitate linkage with other cap-and-trade systems the United States will be required to set up a compliance regime that is similar to the international systems, especially the ETS, a relatively straightforward task. It will also require the adoption of limits and timetables that are comparable to the level of commitments that have been made by other nations, especially the European Union and Japan. In practical terms this would mean that the U.S. could not set up a system that included a price cap, extensive use of offsets or any other mechanism that undermined the integrity of the system, because it would undermine all the systems connected to it.

The U.S. system should also be connected to the Flexible Mechanisms of the Kyoto Protocol – the Clean Development Mechanism (CDM) and the Joint Implementation (JI). The Flexible Mechanisms are important instruments for facilitating technology and capital transfer to developing countries and, as such, should be encouraged by the United States.

Trading across international borders and purchases of credits under the Flexible Mechanisms should not substitute for domestic action. The American system should generate the vast majority of the carbon reductions within the borders of the United States. It will be impossible to limit global warming to 2oC unless the United States takes immediate action to cap and reduce global warming gases within the United States borders. It is also in the long-term economic interest of the United States to transform our economy through innovation and change. If the United States were to simply buy credits to meet short-term targets, long-term action will be more costly and disruptive.

To drive technological change and innovation and hence to reap the longer term economic benefits within the U.S. borders while allowing for international cooperation it will be necessary to set both aggressive limits on global warming gasses and to limit the extent to which domestic

Question 3. International Linkage
Submitter's Name/Affiliation: John Coequyt / Greenpeace US

targets may be met through the so-called Flexible Mechanisms.

Question 3. International Linkage
Submitter's Name/Affiliation: John Coequyt / Greenpeace US

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

It is essential that they system be linked to the international systems set up under the Kyoto Protocol. These systems are basically "made in the USA," having been negotiated by the previous administration. It is essential that these markets function smoothly together and grow to promote widespread change.

Question 3. International Linkage
Submitter's Name/Affiliation: John Coequyt / Greenpeace US

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

This would depend on the scope of the US system and how this would relate to other domestic systems such as the European Union trading system. The main architectural points in common that would be needed include very similar emission reporting methodologies, registries and an ability to coordinate compliance issues where liability issues across system may arise.

Question 3. International Linkage
Submitter's Name/Affiliation: Hobson, Physics, University of Arkansas

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Most definitely! This is an important aspect of any U.S. trading system, because the problem is a global one.

Question 3. International Linkage
Submitter's Name/Affiliation: Hobson, Physics, University of Arkansas

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Hobson, Physics, University of Arkansas

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Hobson, Physics, University of Arkansas

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Kevin Fay, ICCP

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

ICCP has always supported the concept that "a ton is a ton is a ton" or that all verified emission reductions are equal. Therefore, we support the idea that a US GHG emission reduction program would be fungible in some way with other trading programs. For example, emission reductions from energy efficiency and carbon sequestration projects in other countries should be fungible in a US program. If not prohibited, the trading markets are likely to identify the most efficient means of making this happen. Although there are political and legal hurdles to adding international trading to a domestic system, at a minimum the domestic program should ensure that verification systems are comparable with international programs, with a goal towards legal compatibility in the future.

Question 3. International Linkage
Submitter's Name/Affiliation: Kevin Fay, ICCP

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

If a cap and trade system is adopted, it would appear that ultimate cost-effectiveness could be achieved by having the largest market within which to operate. The political benefits could, therefore, be significant. Leaving the door "open" to realize these benefits should outweigh the difficulties.

Question 3. International Linkage
Submitter's Name/Affiliation: Kevin Fay, ICCP

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Let the market decide until such time as a more formal political linkage is desired. The development of linkages with individual countries should avoid, if possible, requiring a legislative vote on each proposed linkage.

Question 3. International Linkage
Submitter's Name/Affiliation: Kevin Fay, ICCP

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

The most important aspects for linkage are assurances of comparable verification systems, appropriate clearinghouse structures to prevent double counting and to assure proper accounting, and effective legal protections to assure the rights of participants.

Question 3. International Linkage

Submitter's Name/Affiliation: Industrial Energy Consumers of America

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Creating a trading system just between developed countries means manufacturing industries will simply move their emissions to developing countries along with their jobs. This is not a solution.

The large emission increases are not coming from developed countries, they are coming from developing countries. Developing country emissions will soon be as large as that of developed countries. For example, China's growth in CO2 emissions from fossil fuels each year exceeds the total that the EU was supposed to reduce from 1990 to 2012.

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 a energy mix that is cost effective and less carbon intensive, implementing a developed country ghg trading system will not have a meaningful impact on reducing ghg emissions. Instead, it will raise energy costs and move more manufacturing jobs to developing countries.

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.

A global ghg trading system is not workable. It must be global and include major developing countries. 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 3. International Linkage
Submitter's Name/Affiliation: Industrial Energy Consumers of America

Clarifying Question 3a:

- **Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?**

Question 3. International Linkage
Submitter's Name/Affiliation: Industrial Energy Consumers of America

Clarifying Question 3b:

- **If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?**

Question 3. International Linkage
Submitter's Name/Affiliation: Industrial Energy Consumers of America

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Question 3. International Linkage
Submitter's Name/Affiliation: Ian Carter/IETA

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

IETA is very supportive of mechanisms to link any US system with other countries around the world. Greater linkage will mean a broader geographical scope of trading and more liquidity and encourage the most cost-effective reductions of greenhouse gases. This in turn will lower compliance costs for industry. For example linkages to offsets programs in developing countries will allow access to less expensive GHG reductions, already available to EU ETS participants under Clean Development Mechanism(CDM) and Joint Implementation (JI) provisions. Lack of such access could prove to be an important disadvantage for US industry. We believe the potential benefits of linkage are very large and outweigh the potential difficulties.

A substantial body of work has been done by IETA as well as other institutions on the issue of linking GHG trading schemes (see attached study by Haites and Mullins). The broad conclusion is that from a technical point of view the barriers to linking GHG schemes are not substantial and relate primarily to consistency in defining the currency. There are other issues that need to be monitored, with potential consequences for competition and environmental delivery. These include sources covered, emissions covered, the stringency of the overall target, monitoring, reporting, and validation requirements, registry provision, and penalties. (Discussion attached)

The process for linking, in the absence of an international multilateral agreement, could be structured as negotiated agreements between two or more parties to ensure mutual recognition such that any imported allowances or credits are acceptable as substitutes for those of the importing system.)

Question 3. International Linkage
Submitter's Name/Affiliation: Ian Carter/IETA

Attachment: Text of Discussion of Issues Related to Linkage

Sources Covered: The trading programs can differ in regards to the categories of emitters that are covered under a specific system. The difference in coverage would not raise issues of technical compatibility but it may give rise to equity and competitiveness concerns by all sources as well lead to increased emissions from excluded sources.

Emissions Covered: The Kyoto Protocol as designed identifies six greenhouse gas emissions that must be regulated,. Energy-related CO_2 emissions dominate the total emissions in most countries that have emissions reduction commitments. Differences in coverage do not pose any challenges when linking two emissions trading programs but they may raise concerns about comparable sources in the two regimes receiving a differential treatment.

Stringency of Overall Target: The stringencies of overall emissions may vary across programs for different reasons impacting the compliance costs for participants. Linking with domestic emissions systems where marginal abatement cost in one system is higher will increase the price for the combined system and providing the system with a higher abatement cost with an advantage. The concerns would not be in regards to compromising the overall environmental integrity nor regarding technical compatibility but more in regards to equity concerns.

Monitoring, Reporting, and Validation (MRV) Requirements: MRV is what measures and defines the commodity, ensuring that both systems are trading in the same commodities. Alternative MRV systems for greenhouse gases with differing levels of accuracy are available. Differences in MRV requirements should not affect the economic efficiency because trading decisions should not be affected by the cost of the monitoring system.

Registry Provisions: When two emissions trading systems are linked, it must be possible to move allowances or credits from one registry to another. If both programs choose to share a common approach to the way their respective registries may be structured future transfers of credits will be straightforward. If the two systems adopt differing registry structures credit transfers may still be possible but complications may arise due to incompatibility. This will involve higher administrative costs and possible induce accounting errors.

Penalties: Participants in different emissions trading systems are subject to penalties if they do not remit sufficient allowances or credits to cover their actual emissions. Penalties may include a financial penalty, a loss of allowances, or a combination of both. If a penalty is structured so that it is substantially higher than the market price it will ensure that the aggregate emissions target is always met even if the compliance cost becomes very large. If penalty is very different between the two emissions trading systems then the environmental integrity may be compromised by the combined system.

Question 3. International Linkage March 13, 2006
Submitter's Name/Affiliation: Lisa Beal/Interstate Natural Gas Association of America (INGAA)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

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 January 2006. 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. Emissions from natural gas pipelines are only are part of this already small contribution. 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 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.

Under such a program, INGAA generally supports linkage with market-based regulatory programs in other countries as one way to provide flexibility and reduce the cost of meeting the requirements. Linkage can also help multinational companies better manage their response and their compliance costs and provide better overall reduction results. This could potentially include linkage with international emission offset programs such as the Clean Development Mechanism (CDM) as well as linkage with international cap and trade program such as the EU Emission Trading System (ETS).

With that in mind, linkage should not be allowed to defeat important features of a possible U.S. program. For example, if linkage to other cap and trade programs is complicated by the U.S. use of a "safety valve", it is more important to maintain the safety valve than to provide linkage with other programs.

At the same time, all other current and proposed programs, including the EU ETS, Canadian Large Final Emitter program, Regional Greenhouse Gas Initiative and California use a sectoral approach that would seem to make linkage more compatible with a sector-focused U.S. approach.

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

3.) Should U.S. system be designed to eventually allow for trading with other greenhouse has cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Linking U.S. GGE credits to other nations is simply not desirable. In fact, it may be counter-productive in the sense that it may encourage foreign entities to buy our credits and not reduce their own emissions, effectively negating the value of our efforts.

Furthermore, the reliability of certain countries around the globe is questionable at best. Their ability to measure their own outputs can be crude or simply “optimistic.”

3. Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

RESPONSE: Representatives of the government of Canada have recently stated that the advisability of multi-nation trading is in question. The Canadian government further stated that they will pursue a home- grown Canadian strategy. We would suggest that the US follow this course.

Any efforts that the USG undertakes should concentrate on increasing efficiency and lowering the intensity of GHG emissions in the United States, and exporting technology to our trading partners.

Question 3. International Linkage
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Please begin your response HERE. (no page limit)

On page 13 you ask about linkage to foreign trading systems. This is a good idea though you need to be careful that the other system is working well. For instance, if Europe lets in all of Russia's hot air, the system will be next to meaningless. Allowing trading with a limit of 10% or so would seem to be an appropriate way to proceed. Allowing too much foreign trading will increase price uncertainty.

Question 3. International Linkage
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Please begin your response HERE. (no page limit)

Leaving doors open would not seem to be problematic.

Question 3. International Linkage
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit)

The criteria in McCain-Lieberman are good.

Question 3. International Linkage
Submitter's Name/Affiliation: Prof. Charles Kolstad, University of California

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: LEE LANE – CLIMATE POLICY CENTER

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Linking the US system to the EU ETS or other Kyoto systems would entail many severe disadvantages and no advantages. The key feature of the Bingaman Bill is the safety valve. The safety valve ensures that the cap-and-trade system will not require the economy to incur wasteful abatement costs to achieve emission reductions too soon and at too high a price. It also avoids what would otherwise be high costs associated with allowance price volatility. (Hubbard and Stiglitz) Thus, the safety valve enhances the chances that the benefits of the GHG system may exceed its costs.

The safety valve, however, is incompatible with the EU ETS. And the EU having proclaimed and repeatedly reaffirmed the goal of limiting global mean temperature to an increase of 2 degrees C, is clearly not going to accept a safety valve. Thus, there is an inescapable choice between international emission trading and the safety valve.

Trading with Kyoto system countries also entails opening the US system to the bogus hot air allowances. The large Russian and Ukrainian stocks of specious hot air allowances could indeed hold down the costs of meeting Kyoto's unrealistically stringent emission targets. In the Kyoto system, hot air allowances performed this function at the expense of requiring large income transfers from American industry to Russia and Ukraine. These transfers promised no environmental benefit and would have compromised the legitimacy of the entire system.

The safety valve provides cost control without these disadvantages. It requires no transfer payments to foreign governments. It introduces no artificial allowances.

Who would suffer from giving up the safety valve to permit international trading of allowances? Certainly, American industry and the cause of national competitiveness would suffer. Integrating the US with the EU-ETS would drive domestic allowance prices to the excessive levels that made Kyoto so disadvantageous to the US in the first place. It would also 'import' to the US the allowance price volatility that has already been a characteristic of the EU ETS.

Who would benefit? Companies that expect to receive an overly generous grant of emission allowances would might gain from integration of the US system and the EU ETS. Such companies would increase their windfall profits by selling excess allowances at the much higher allowance prices that would prevail if integration occurred. Most importantly, perhaps allowance traders would profit. For such interests allowance price volatility and the high transaction costs of international allowance trading are both profit opportunities.

The question that Congress should ask is whether these opportunities for private rent seeking are worth the sacrifice of national competitiveness.

Question 3. International Linkage

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

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Brief Response: If a cap-and-trade system is established, it must be part of a universal system to be effective. A "stand alone" system for one nation will fail to accomplish world-wide reduction.

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 3. International Linkage

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 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Response: If linkage is desirable, then participation of all nations is essential if we are to reduce world-wide GHG emissions.

Many economists believe that an international system will never be feasible.

The EU is busy capping-and-trading, but has not reduced GHG emissions.

Cap-and-trade only shifts emission sources.

Question 3. International Linkage

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 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Response: The EU system is generally recognized as the "central" linkage system. The United States can join the EU system with an established structure and practiced traders.

Question 3. International Linkage

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 3c:

- What sort of institutions or coordination would be required between linked systems?

Response: A United States agency to monitor the cap-and-trade process would be required to assure that the U.S. is a fair player in the world market.

Since the U.S. would be a newcomer to the market, we must assure that we enter the existing system with no special benefit or advantage.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael MacCracken/Climate Institute

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Generally yes, and the sector-based system of long-term emission rights (LTRs) with a back-up system of one-year permits as a safety valve could be readily interfaced with other systems. In particular, the electric generator sector component and the vehicle manufacturer component would be very easy to extend into other nations—including especially Canada and Mexico.

In addition, in that I propose a "**carrot and stick**" approach, the slowly rising economy wide tax on carbon could be readily interfaced with similar steps by other nations. This would not mean that the tax would be the same in all countries, but that steps could be taken to ensure that it would encourage, in effect, the same pace of effect as in other countries.

However, a really important consideration is to give a firm indication of the long-term control strategy that is going to be taken, and compromising this objective by undertaking frequent adjustments to match policies in other countries would really defeat the purpose of ensuring that industry and the public have a clear indication of the control path ahead so that they can plan and cost accordingly. To ensure that the US strategy gives industry and the public a consistent indication, I would tend to harmonize with other countries by choosing a system that would make it advantageous for them to actually join the US approach rather than the US moving to the types of short-term, piecemeal approaches that are getting set up in some other countries.

More generally, encouraging an international approach that is of the cap-and-trade type needs to be at the heart of what the US pushes for internationally. Negotiations on seemingly arbitrary and differing fixed caps among nation-states, as was negotiated and incorporated into the Kyoto Protocol, has the effect of creating arbitrary barriers and inflexibilities that seems likely to make implementation more expensive than it should need to be. What is needed is for all of the nations to set an aggressive pace. To make this happen, the nations collectively need to set an overall cap (with an increasingly expensive safety valve) and then let international industry be given the means and responsibility of meeting this cap in as innovative and cost-effective a manner as an open market system can generate (and this could well be at very low cost if enough options for industry are left on the table). The LTR approach that I propose creates the long-term cap that is needed, and the flexibility provided by LTRs would allow the trading necessary to be effective and economical. For example, were all vehicles being used in the developed world (wherever they were manufactured) covered by the system, vehicle manufacturers would be able to decide on the most effective choice for their particular company (and their customers)—whether it was most cost effective to improve gas mileage in the US or somewhere else, to buy back low mileage cars from the poor in Mexico in order to sell more cars in France, or to switch freight from trucks to rail in order to be able to build more large cars, or whatever. What is important would be that the market rather than government would do the evaluation and decide.

With respect to developing nations, equity would seem to demand that their total emissions not be capped at this point. I do not think this will result in a problem because: (a) the system I would propose would require that the products they export (e.g., as a result of outsourcing) into

the developed (or capped) world would have to be covered by the emissions control system, and (b) for the developing nations to remain competitive, they will not be able to simply waste energy as their standard-of-living (and so salaries) rise; the developing nations will have to be using energy as efficiently as possible and so will be seeking to purchase the most energy efficient technologies that they can, meaning exports from the developed world. Incidentally, I would also require that exports from the developed world be covered by the emissions cap system so that when the developing countries eventually are brought under the cap umbrella, there would not be a significant bump in the system. While this might raise the cost of products exported to the developing world, this effect would likely be limited.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael MacCracken/Climate Institute

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Industry would most benefit from a long-term plan—and if it is long-term, then the plan will need to involve significant reductions in emissions over time. For this reason, while a short-term plan would likely allow easier interfacing with other countries, a long-term plan would likely be most advantageous for US industry and for the consumer. Given that other countries have generally not yet actually adopted a long-term plan, it will end up being easier for them to adjust to our plan than vice-versa, presuming we implement an aggressive enough plan; the long-term emissions rights (LTRs) program that I propose should attract the interest of other nations in a viable long-term program.

Question 3. International Linkage
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Please begin your response HERE. (no page limit)

No. As you proceed in obtaining information on the many questions posed in your White Paper, we urge you to carefully study the experience of the 1970s when the government attempted to use regulatory instruments to manage energy markets and promote alternatives to fossil fuels. While that experience does not perfectly parallel the system you envision, it is both instructive and a source of humility and realism. We believe that you have seriously underestimated the difficulty in making a "cap and trade" system efficient and cost-effective.

The American public and our economy have been impacted by the high oil, natural gas, and product prices that we have been experiencing for well over one year. Unfortunately, there does not appear to be any near-term prospect for them returning to prior levels. Hence the economy has and is receiving a strong price signal that is changing behavior and which will be more efficient and cost-effective in affecting emissions that any "cap and trade" program.

Question 3. International Linkage
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: William O'Keefe, George C. Marshall Institute

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Walter Misiolek/University of Alabama

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Response: Most definitely. Adoption of a system designed to allow trading between US firms and other entities around the world would reduce compliance costs for American producers, reduce impacts on the American economy, and encourage the development of programs of similar design in other nations and world regions.

The recent literature in environmental economics argues that establishing a number of regional cooperation agreements could be more successful than a single global treaty in achieving global reductions in greenhouse gasses.[1] The EU ETS and Canadian LFE systems share common design features with the US acid rain program. A US greenhouse gas program designed along similar lines would solidify this regulatory approach as the design of choice among developed nations, which could provide a stimulus for other nations to develop similar programs.

Development of a US program focusing on large final emitters has important advantages independent of linkages with other regional and national programs. However, the opportunities for integration with other existing programs offer important additional advantages for US firms in terms of reducing their compliance costs by facilitating simple, direct trading mechanisms that would not require elaborate oversight regimes and trading rules, which would impede trades.

The US acid rain program has demonstrated the efficiency advantages of an unencumbered trading program for emissions allowances. Development of a US system that could be integrated with the Canadian LFE system could lead to a North American emissions control framework among NAFTA partners. Such a system could be facilitated by the North American Commission on Environmental Cooperation. Development of a North American regional program similar in design to the EU ETS program would be an important step toward eventual integration with the EU ETS program. The wider trading opportunities for US firms that would be afforded by linkages with the Canadian and EU systems would work to their advantage and would reduce cost impacts on the American economy. Additionally, development of a common design structure among western developed economies would provide a model for developing economies. Firms within those economies would become advocates for development of systems of similar design that would allow open trading of emissions allowances with their North American and European counterparts. The common design would also facilitate political processes in developing countries to adopt a program compatible with the shared US/Canadian/EU design. The benefits from developing a program that could eventually lead to a number of integrated regional world systems are very large and should not be set aside without careful thought very good reason.

[1] See for example Asheim et al, Regional Versus Global Cooperation for Climate Control, *Journal of Environmental Economics and Management*, 51 (2006) 93-109.

Question 3. International Linkage
Submitter's Name/Affiliation: Walter Misiolek/University of Alabama

Question 3. International Linkage
Submitter's Name/Affiliation: Missouri River Energy Services

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

If a mandatory greenhouse gas emission reduction system were established, Missouri River Energy Services believes that a program should be designed to leave open the possibility of trading with greenhouse gas system in other countries.

It is important to realize that, as units of local government, public power systems do not have the same opportunities as private entities for greenhouse gas emissions offsets. For instance, state investment restrictions would likely preclude reforestation in developing countries. Recognition of this fact, and efforts to provide needed flexibility, are essential for public power system's not to be disadvantaged in any control regime.

Question 3. International Linkage
Submitter's Name/Affiliation: Craig Montesano/National Mining Association

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Internationally, the United States must continue to lead the move to technology-based solutions that will reduce the rate of growth in global emissions while enhancing national security and promoting economic growth and social advancement. NMA believes that the following principles are essential for any international climate agreements going forward:

- Identification and reduction of barriers to the implementation and transfer of climate technology with a focus on identifying and addressing investment, intellectual property rights and other barriers that may impede technology transfer.

- A balanced approach that recognizes the economic, national security, sustainable environment and standard of living needs of each country.

- Respect for the sovereignty of individual countries.

- Measuring progress based on greenhouse gas intensity rather than on emission caps for those agreements to which the United States is a party.

Question 3. International Linkage
Submitter's Name/Affiliation: National Environmental Trust

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Any U.S. program to regulate GHG must be designed to facilitate and encourage a seamless transition into the international carbon trading system

Many believe that cap-and-trade programs are economically superior to more traditional command-and-control approaches at protecting public health and the environment because the emissions target—established via the pollution cap—is achieved at a minimum economic cost through the trading of the allowances. A cap on emissions is set and then allowances are issued for that amount. The allowances are allocated to sources in the allowance market. Those who can reduce their emissions for the least cost will opt to reduce emissions beyond the number of allowances they hold and sell the excess allowances to sources with higher control costs. In the end, costs across all sources are equalized and the total cost of attaining the "pollution cap" is minimized. The larger the market, the greater the opportunity for innovation and least-cost reductions. The goal of a U.S. cap-and-trade system for carbon pollution is to reduce pollution levels down to the level of the pollution cap in the least costly manner possible.

Given the increasingly global nature of U.S. national markets and economic transactions, it is crucial that U.S. businesses be afforded the opportunity to participate in the international carbon marketplace. A decision to handicap U.S. business participation in the world carbon market will deprive U.S. business interests of competitive advantages and significant economies of scale while increasing prices at home and distorting markets abroad.

There is no compelling policy reason to deprive U.S. businesses of the least costly and most economically-efficient carbon reductions available. Furthermore, the current international carbon trading market is largely tailored after the U.S. Clean Air Act Acid Rain emissions trading program and was so structured at the insistence of the Clinton Administration. A decision to isolate the U.S. carbon market from the international marketplace, by inadvertence or design, cannot be supported by any compelling policy rationale.

It is therefore crucial that U.S. companies participate in this broader market. However, this participation will not be possible if the U.S. domestic carbon trading system is fundamentally incompatible with the global trading system. For instance, if enacted, the NCEP recommended model would not allow the U.S. to join the global trading market. This is so because the NCEP "soft cap" (i.e. no absolute limitation on emissions as long as emitters are willing to pay $7 a ton for any amount emitted over the "cap") allows unlimited increases in carbon emissions and undermines the international "hard cap" system (i.e. the absolute ceiling on emissions cannot be exceeded if "allowance" payments are made). The effect would be that an allowance reflecting a ton of carbon "reduced" in the U.S. will have a different market value then an allowance that represents an actual ton reduced in the global trading system. Reconciling these valuation disparities will significantly frustrate the ability of U.S. companies to have their domestic allowances recognized in the global market and visa-versa.

Question 3. International Linkage
Submitter's Name/Affiliation: National Environmental Trust

The more insidious impact of a U.S. carbon trading system with such a "soft cap" that allows unlimited emissions growth would be the corrosive effect it would have on ongoing international negotiations to forge agreement on a second round of mandatory reduction requirements for the post-2012 compliance period under the Kyoto Protocol. If Kyoto Protocol nations perceive that the emerging U.S. program will not actually reduce net emissions (but merely temper the rate of growth), nor allow U.S. integration into the international carbon trading markets, then there will be tremendous reluctance to commit to further meaningful reductions under the Kyoto Protocol. The effect of such a development on future efforts to combat global warming and the international (and emerging domestic) carbon market would be destabilizing and possibly devastating.

Question 3. International Linkage
Submitter's Name/Affiliation: (Arline Seeger & Hunter Prillaman / National Lime Association)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

The U.S. greenhouse gas program should be coordinated with the programs of other nations. The United States should pursue measures that encourage international technology transfer and development.

To the extent a U.S. program involves trading, trading should be international if it can be achieved without undue disruption of the U.S. economy. Costs and burdens of greenhouse gas emission reductions should be distributed across the economy, including the world economy. However, the United States must avoid the problems that have already emerged in trading systems in other countries, and should only participate in international trading if it is consistent with the goals and structure of the U.S. program. For example, in Europe, the allocation system is inequitably structured to benefit the power industry, with a devastating effect on energy-using industries (including the European lime industry). The United States should not allow the trading systems of other countries to drive the development of the U.S. program, but should look for ways to coordinate the systems without harming the U.S. economy.

Question 3. International Linkage
Richard Rosenzweig/ Natsource LLC

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Richard Rosenzweig/ Natsource LLC

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

There are significant benefits to linking a U.S. greenhouse gas (GHG) program to other cap-and-trade systems which would outweigh the potential difficulties. However, key issues need to be carefully considered in linking the programs (see following paragraphs). Linking to a program such as the EU Emissions Trading Scheme (EU ETS) would provide additional incentives to U.S. covered sources to achieve domestic emission reductions that could be sold in either domestic or international markets. If the U.S. linked to a program in which marginal costs of abatement were lower than in the U.S., linking could also lead to significant compliance cost savings for U.S. covered sources. Linking would make the emissions market deeper and more liquid, and would allow for better price discovery. It would also facilitate efficient emission reductions within and between companies with operations in multiple countries. Finally, it would set the precedent for future linking efforts, and would help create a more liquid, efficient GHG market in which emission reductions are implemented where they are most cost-effective, and in which overall costs of meeting targets are minimized. In the 1990s, the U.S. was one of the leading supporters of emissions trading as a cost-effective means of meeting emission reduction objectives, and of the creation of efficient global GHG markets to address climate change. The U.S. can set an important example for future efforts by linking to international markets.

Question 3. International Linkage
Richard Rosenzweig/ Natsource LLC

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

The benefits of linking a U.S. GHG cap-and-trade program to another program, and potential obstacles to such linking, would vary depending upon the design features of the U.S. program and the other program in question. Therefore, the process for deciding whether and how to link to a specific system would need to begin with a detailed review of the design features of each program, and a consideration of differences between programs that could pose obstacles for linking and/or that could reduce the benefits of linking.

The table below summarizes some of the key differences between the proposal for a U.S. trading program introduced by Senator Bingaman in 2005, legislation by Senators McCain-Lieberman to create a trading program, and the EU Emissions Trading Scheme.

Table 1: EU ETS vs. U.S. emissions trading programs: Comparison of main features

	Bingaman Proposal	McCain-Lieberman Proposal	EU ETS
GHG covered	Broader coverage than McCain-Lieberman, because all upstream sources are covered.	85% of national GHG emissions.	CO_2 emissions from the combustion of fossil fuels (approximately 45% of emissions are covered).
Trading system	Mandatory trading program for all upstream sources plus downstream sources of process emissions; program's overall annual targets based on emissions intensity targets, but sources are assigned absolute emissions targets.	Mandatory cap-and-trade system for large emitters in the energy sector and selected industrial sectors, and for upstream suppliers of transport fuels, based on absolute emissions targets.	Mandatory cap-and-trade system for large emitters in the energy sector and selected industrial sectors, based on absolute emissions targets.
Tradable units	U.S. allowances; allowances for eligible early reductions (i.e. prior to 2010); payment at the safety valve price; allowances for eligible offset project activities, but not allowances, offsets or credits that are issued by a foreign country; and credits for 1) long-term geologic CO_2 sequestration, 2) use of covered fuels as feedstocks, 3) exports of covered fuels, and 4) destruction or export of HFCs, PFCs, SF_6 or N_2O.	U.S. allowances; tradable allowances from another nation's market; a registered net increase in sequestration; a registered GHG reduction (i.e. eligible offset); or a credit against future reductions.	EU allowances (EUAs), CERs and ERUs (excluding nuclear power and LULUCF projects)
Trading periods	Initial targets set for 2010 – 19.	Initial targets set for 2010 – 15.	Phase 1: 2005 – 2007. Phase 2: 2008 – 2012.

	Bingaman Proposal	McCain-Lieberman Proposal	EU ETS
Allocation of permits	Total allocation in 2010 equal to forecasted GDP multiplied by emissions intensity target equal to 2.4% below 2009 forecasted intensity; each subsequent year the intensity target is reduced by 2.4%; the grandfathered percentage starts at 91% in 2010, and decreases to 87% in 2020.	All covered sources receive free allowances roughly equal to their year 2000 emissions.	Responsibility of Member States (phase 1: mostly free allocation based on historical emissions).
Sanctions	Penalty equal to three times the safety valve price for that year for each allowance not submitted. Failure to pay penalty would result in civil penalties of not more than $25,000 per day of violation.	Penalty equal to three times the market value of a ton of GHG emissions.	Penalty of EUR 40 (phase 1) and EUR 100 (phase 2) and obligation to cover deficit in subsequent period.
Monitoring, reporting and verification	Monitoring and reporting standards and rules to be developed; annual reporting.	Monitoring and verification standards to be developed; annual reporting.	Monitoring of each installation, verification by independent entities
Price cap	Price cap ("safety valve") price of US $7 per metric ton CO_2e in 2010, increasing 5% per year thereafter.	No price cap.	No price cap.

The proposed U.S.-based trading programs share some features of the EU ETS, but differ from the EU ETS and each other on a number of key issues. The following discussion briefly highlights some of the key differences between the programs, and the implications of these differences in the context of linking. Natsource has provided analysis on these issues, and can develop further analysis exploring different policy options to address them. Many of the challenges of linking can be addressed through various policy options.

Eligible compliance instruments

Senator Bingaman's proposal would allow for use of several GHG reduction types which would not be allowed under the EU ETS. It also would allow for safety valve payments, which raises other issues (see separate discussion on price caps below). Importantly, Senator Bingaman's proposal would not allow for use of "credits or allowances issued by a foreign country." Therefore, reductions created by the project-based mechanisms incorporated in Articles 6 and 12 of the Kyoto Protocol (KP) would not be eligible for compliance.

The McCain-Lieberman proposal would allow "allowances from another nation's market" to be used for compliance. McCain-Lieberman does not appear to allow for the use of reductions created by the project-based mechanisms incorporated in Articles 6 and 12 of the KP, but would allow for use of the following reduction types: registered increases in sequestration, eligible domestic offsets, and credits against future reductions (i.e. "borrowing"). None of these reduction types would be eligible under the EU ETS.

Differences between programs regarding eligible compliance instruments may create concerns that an instrument which is not eligible for compliance in the U.S. will be able to enter the U.S. trading system via the linked system, and vice versa. For example, upon receiving payment from an EU installation for a U.S. allowance, a U.S. firm could use the proceeds to purchase a registered increase in sequestration. If such sequestration credits are priced lower than U.S. Allowances and EU Allowances, linking the systems would increase the amount of sequestration tons purchased by U.S. firms relative to a no-linking scenario. Thus, EU installations would effectively be able to use U.S. sequestration tons for compliance, and the EU's restrictions could thereby be circumvented.

In addition to raising issues relating to compatibility of eligible compliance instruments, linking a U.S. system to the EU ETS would create challenges for the EU's ability to comply with its target under an international regime. The EU would need to consider the possibility that any purchases of U.S. GHG instruments would not be eligible for its compliance with its national target. This would be true if the U.S. linked its program with Canada's Large Final Emitter program that is underdevelopment.

Lastly, there are questions regarding whether the U.S. programs, in their current form, would be open to linking. The McCain-Lieberman bill would accept allowances from another nation's market, but Senator Bingaman's approach would not do so in its current form.

Use and implementation of price caps

The proposal developed by Senator Bingaman allows covered entities to make a payment at the safety valve price in lieu of submitting a compliance instrument. The safety valve price will be $7 per metric ton CO_2e in 2010, increasing 5% per year thereafter. The safety valve would effectively cap compliance costs under the program at the safety valve price.

This price cap could pose a significant obstacle to linking with the EU ETS. In the case of the proposal developed by Senator Bingaman, if safeguards are not implemented, U.S. firms could sell all of their allowances to EU buyers and comply for $7/ton. One possible approach for minimizing this arbitrage would be to limit use of the price cap to the difference between a U.S. firm's emissions and its emissions target.[1]

In practice, the price cap would segment the market. It would immediately place EU buyers on different footing from U.S. buyers, as the U.S. Government would not provide $7 compliance instruments to the EU buyers in order to lower their compliance costs. Presumably, EU buyers, who would not have access to the price cap, would be able to buy U.S. allowances offered at prices higher than the price cap (assuming that prices in the EU market will be higher than $7). This segmentation would reduce the economic efficiency benefits of the system as a whole. U.S. sellers may be able to sell allowances to EU buyers at levels higher than their (the U.S. sellers') marginal costs of abatement, since prices in the EU segment of the U.S. market would tend to converge upward toward EU prices. This upward price convergence, in turn, could lead to

[1] This option was recommended in Blyth and Bosi, "Linking Non-EU Domestic Emissions Trading Schemes," International Energy Agency, 2004.

greater use of the price cap in the U.S., and fewer emissions reductions than in a no-linking scenario.

Stringency of targets and "comparability of effort"

The McCain-Lieberman legislation proposes targets that are similar to the EU ETS in terms of stringency. However, in its current form Senator Bingaman's proposal incorporates considerably less stringent targets. This could raise concerns over comparability of effort. The McCain-Lieberman proposal sets caps at 2000 levels from 2010-15.

The overall target in Senator Bingaman's approach in 2010 would be equal to forecasted GDP multiplied by an emissions intensity target equal to 2.4% below 2009 forecasted intensity. Each subsequent year the intensity target would be reduced by 2.4%. This would mean that in 2019, the emissions intensity target would be approximately 22% below 2009 emissions intensity levels, which appears to be a substantial reduction. However, if U.S. GDP grows by an average of 3.2% per year between 2010 and 2019 (the average rate from 1995-2004[2]), the total allocation under this proposal would be 7.5% higher than 2009 levels in 2019.

In 2008-12, in order to meet national emission reduction targets and the EU's overall target under the Kyoto Protocol of 8% below 1990 levels in 2010, most EU Member States will set emission reduction targets for EU ETS sectors at levels between 1990 and 2000 levels.

The fact that Senator Bingaman's approach would be less stringent than the EU ETS would raise concerns in Europe that: 1) U.S. firms would not undertake emission reduction efforts comparable to those in the EU, and that this is inequitable; 2) U.S. firms would be able to profit from significantly less stringent standards by selling excess reductions to EU firms; and 3) EU firms would make significant use of lower-priced U.S. allowances to meet compliance requirements rather than implementing internal emission reductions.

Compliance penalties

The EU ETS imposes a penalty for non-compliance of €40/ton in 2008-12 and €100/ton in 2008-12. Firms that fail to meet compliance requirements are also required to pay back their compliance shortfall (in tons) in the subsequent year. The McCain-Lieberman proposal has a fairly stringent financial penalty for non-compliance (three times the market value of a ton of GHG emissions), but does not have an environmental penalty involving "payback" of tons. The proposal developed by Senator Bingaman incorporates a price cap of US $7 per ton in 2010, and imposes a penalty for non-compliance equal to three times the safety valve price for that year for each allowance not submitted. It does not impose environmental penalties. The availability of the safety valve would allow firms to pay a fairly low-cost penalty to the Government rather than meeting compliance requirements.

Linking the EU ETS to the Bingaman program likely would raise concerns that linking would undermine the environmental integrity of the EU ETS system, since it could be argued that the

[2] U.S. Bureau of Economic Analysis, "Gross Domestic Product," http://www.bea.gov/bea/dn/nipaweb/SelectTable.asp?Popular=Y (accessed February 20, 2006).

Question 3. International Linkage
Richard Rosenzweig/ Natsource LLC

U.S. program would not meet its target level of emissions due to the availability of the safety valve. In addition, it is likely that linking the EU ETS to the U.S. program would result in an increase in U.S. emissions compared to a no-linking scenario. If EU ETS prices are higher than U.S. prices (which appears certain if the U.S. program had a $7 safety valve), EU buyers would purchase U.S. allowances, pushing U.S. prices up to the safety valve price, and leading to greater use of the safety valve for compliance and therefore higher emissions.

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

The central element of implementing a linking arrangement would be for the relevant governments to confirm in law or regulation that allowances in the other program would be recognized for compliance under the domestic trading program. However, before this final stage is reached, it likely that the key ministries responsible for implementing the trading programs would engage in discussions to identify key issues that must be resolved in order to link the two systems. The EU is reportedly engaged in similar discussions with the Regional Greenhouse Gas Initiative in the Northeastern U.S., Norway, Canada, Australia and Switzerland.[3]

Other elements which would need to be coordinated in order to link systems include the linking of registries which track trading of emissions instruments in and out of countries and covered sources' accounts. By the time a U.S. trading program is implemented, there will have been significant experience with the development and implementation of registry systems in countries that are signatories to the Kyoto Protocol.

[3] Point Carbon, Carbon Market Europe, March 3, 2006, via www.pointcarbon.com.

Question 3. International Linkage
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Yes. Global solutions should be sought for global problems. Linkage to other programs supports the goal of encouraging all countries to participate in emission reduction programs. There are economic advantages to providing more market opportunities to U.S. entities that cut or offset greenhouse gas emissions. Under the current Kyoto Protocol, the U.S. cannot sell offsets to participating members because the U.S. is not a party. In New Mexico we are working with our agricultural community to establish GHG emission offsets to potentially be sold on the Chicago Climate Exchange. An international carbon program would provide our agricultural community with the opportunity to sell agricultural offsets to a broader market at the best price possible.

Question 3. International Linkage
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Yes. The challenge with international linkages would be developing a program that assures that all emission reductions are real and verifiable, which would require some standardization of protocols for monitoring, reporting and compliance. Currently, many states are developing their own GHG emission reporting requirements and registries. It has not been difficult to develop these with an eye toward standardization in the future. In that same vein, it makes sense to try and develop a national program that leaves the door open for international linkages.

International linkages can also help to ensure that the costs of GHG reductions do fall disproportionately on countries that take action. Also, finding reductions in other markets could also provide the least-cost reduction options for U.S. companies.

Question 3. International Linkage
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Sandra Ely/New Mexico Environment Department

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Like the Kyoto countries, there would need to be recognition of the program, and common reporting protocols and trading system.

Question 3. International Linkage
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Question 3. International Linkage
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

A U.S. cap-and-trade system should be designed to eventually allow for trading with other countries' global warming cap-and-trade systems. The proposed safety valve mechanism, however, poses a serious impediment to U.S. participation in international trading systems.

Economic research shows that linking national cap-and-trade systems improves the overall efficiency of trading because larger markets are more liquid and more efficient at allocating resources towards cost-effective emissions reductions. Linking markets leads to macro-economic benefits because participants have a broader range of emission reduction opportunities and that should therefore lower the overall cost of compliance.

If the U.S. system employs a safety valve mechanism, however, linkage with other systems will not be possible. The market price of CO_2 in the European Union's emissions trading scheme, for example, is already higher than the proposed U.S. safety valve. If trading were allowed between the EU and the U.S., a major distortion would occur. European firms (acting directly or through brokers) would seek to purchase U.S. lower-priced allowances. Their demand would almost immediately drive the U.S. allowance price to the safety valve level, triggering the "printing" of more American allowances. European demand for newly-minted U.S. safety valve allowances would continue until the EU price dropped to the same level. The net result would be to flood the world market with far more allowances – and far less emission reduction – than anticipated even under the NCEP recommendations.

Much like other forms of trade barriers, a safety valve distorts the free flow of allowances in an international trading system. The distortions described here are similar to those that occur when a country attempts to fix the price of its currency and avoid letting its currency find its appropriate exchange rate based on market forces.

Even if the U.S. law permitted international emissions trading, it is very unlikely that other countries would allow their systems to link with the U.S. if it contained a safety valve that produces an artificially low price for allowances. Thus, markets will remain split and the benefits of international trading will not be achieved.

Question 3. International Linkage
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Question 3. International Linkage
Submitter's Name/Affiliation: David Doniger, Natural Resources Defense Council

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

The national registry system under the Kyoto Protocol was designed for just this purpose. It is, in fact, based directly on the computer-based allowance tracking system developed by the U.S. EPA to facilitate trading in the acid rain program.

Assuming we did not have the distortion of a safety valve, and assuming the U.S. reached agreements with other countries to permit international trading, the U.S. could readily adopt a domestic registry that would interlink with other nation's registries and allow trading on the same seamless basis as under the acid rain program.

Question 3. International Linkage
Submitter's Name/Affiliation: (Whitman/NRECA)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

The global nature of climate change requires a global response. This is especially evident in that the greenhouse gas emissions of developing countries such as China and India are growing at a far greater pace than that of the US, and together will overtake US emissions by 2010. An effective global policy response will require participation and mitigation commitments, implemented concurrently, by all countries.

As noted in the committee's white paper, a US policy that recognizes emission reduction activities anywhere in the world can have significantly lower costs than a system that restricts mitigation activities to the US, to a single economic sector, or a single greenhouse gas. NRECA believes that it is important to invest first in the US, supporting America's economic competitiveness and that of our rural communities. At the same time, NRECA would not want to preclude participation in the mitigation efforts of other countries. Indeed, NRECA has an active International Program with the potential for assisting countries in Latin America, Asia, and Africa with the carbon-efficient development of their rural electric industries.

Since the US would have to be a Party to the Kyoto Protocol to participate in greenhouse gas mitigation markets in Canada or the European Union, the US should look beyond this to new, dynamic international efforts. Title XVI of the Energy Policy Act of 2005 will facilitate sustainable international development and voluntary, technology-based partnerships like the Carbon Sequestration Leadership Forum and the Asia-Pacific Partnership on Clean Development and Climate. These types of activity will put developing countries on more environmentally sustainable development paths and lessen their vulnerability to climate change. In general, promoting economic growth and development both here and abroad will provide the resources necessary to develop new technologies and address climate change.

Question 3. International Linkage
Submitter's Name/Affiliation: Orion Energy Systems, LTD

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Yes. In combination with the realities of the success of the U.S. financial markets and their integration into the global financial markets, it seems reasonable to assume that once again the US has an opportunity to take advantage of its world leadership when it comes to developing open and free markets, albeit regulated by necessity.

We cite the Chicago Climate Exchange and the fact that its primary auditor is currently the National Association of Securities Dealers (NASD) that audits member's baselines and annual emissions and will utilize its state of the art market surveillance technology to monitor CCX trading activity against fraud and manipulation. We see no reason that the U.S. market's experience and regulatory model could not as well serve as the emerging market for GHG emission credit and offset activity.

The same standardization of rules and requirements for global financial markets should serve as a model for international emissions trading.

Question 3. International Linkage
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Pew Center Response

Yes. The ability to link to other programs is critical in order to minimize mitigation and transaction costs, and to harmonize obligations under various systems. Companies whose obligations differ in the many nations in which they operate will have a much harder time complying with the requirements. For this reason it is crucial not only to link programs, but also to minimize the differences between relevant aspects of the programs as they are developed.

This position is corroborated by the extensive and ongoing discussions the Pew Center has had with member companies of the Business Environmental Leadership Council (BELC) and other domestic and international corporations about U.S. and international greenhouse gas (GHG) markets. Those that have expressed an opinion unanimously support designing U.S. cap and trade to allow for linkage to other national and regional trading systems. They cite several reasons.

- Most note that a well-functioning global trading market is perhaps the most critical mechanism for minimizing the long-term costs of GHG reductions for firms and society as a whole.
- Among cost-containment approaches, the linking of global GHG markets is among the least distortionary.
- Generally, larger trading volume and greater liquidity of GHG allowances will result in clearer, more stable prices. More stable prices will allow firms to project future prices more accurately and provide the certainty to plan and invest appropriately for the future (for example, in breakthrough technologies).
- Globalizing GHG markets supports the goal of encouraging all countries, including China and India, to participate in making real and verifiable reductions. (Companies note that offsets originating in large emitter developing countries will be among the lowest cost reductions and can be combined with export opportunities for U.S. firms.)

Note that the Northeast Regional Greenhouse Gas Initiative (RGGI) will accept EU and Clean Development Mechanism (CDM) allowances if certain price triggers are reached, but that under the Kyoto Protocol the EU can not accept RGGI allowances because the United States is

Question 3. International Linkage

Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

not a party to Kyoto. RGGI analyses indicate that international agreements that enable two-way linkages would be economically beneficial.

Question 3. International Linkage
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Pew Center Response

In order to link a U.S. program with other systems, reductions would have to be considered real and verifiable by the respective systems. Deciding whether to link would involve evaluating the inventory, methodologies, monitoring protocols and compliance mechanisms of the other systems, and as well as the design of these programs to make sure that the environmental effect of a given reduction is roughly equivalent across the two programs. In addition, care should be taken to design a U.S. program that other countries will be interested in linking with. In particular, mechanisms that alter the environmental integrity of the program (e.g., a low safety valve) would make reductions in one program not necessarily equivalent to reductions in another, jeopardizing the ability to link the two.

Federal legislation will need to address the state and regional GHG cap-and-trade programs now under development, some of which may be linked to each other and to other countries. As with any area of federal policy in which the states have taken the lead, Congress will have to decide on the extent to which the federal program will defer to pre-existing state programs, for example, governing allowance allocation.

Question 3. International Linkage
Submitter's Name/Affiliation: Eileen Claussen/Pew Center on Global Climate Change

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Pew Center Response

Because the validity and verifiability of reductions is critical for trading, measuring, monitoring, and compliance mechanisms would need to be comparable. While this may or may not require a central overseeing body, a shared platform on which to carry out the trades – such as an agreement to use a common monotoring and reporting protocol – would be required.

While elements within each country differ, Kyoto signatory countries, including the EU, Canada and Japan, have trading systems that are inherently linked by means of the treaty requirements. Requirements stipulate that each country needs to develop a consistent national system for estimating emissions and removals of GHGs by their common definition of trading units – Assigned Annual Units (AAUs), Joint Implementation (JI) credits and Clean Development Mechanism (CDM) credits – and by the requirement that an international transaction log (ITL) be established. This shared platform will enable the tracking and the issuance of credits, cancellation, retirement and carry-over to the commitment periods following 2012. In essence, Kyoto parties are linked because they share common definitions, common requirements and a common platform for trading.

William Pizer, Senior Fellow, Resources for the Future

Question 3: Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

There is no question that in a system exclusively designed to reduce emissions now, linkage with other systems would provide overall gains to both systems. However, two caveats are in order.

Even with an exclusive focus on emission reductions, and a clear overall gain to both systems, there are likely to be losers and winners within each system – perhaps far more significant than the overall gain. Price increases in a low price system benefits allowance holders and hurts anyone purchasing allowances or sitting downstream of a purchaser. Price declines in a high price system have the reverse effect, benefiting buyers and hurting sellers. Therefore, the overall gain from linking and equalizing prices must be weighed against internal distributional consequences.

Of course, linking systems with basically the same price would avoid such effects and, indeed, harmonizing prices before linking might be viewed as a useful first step.

Note that this ignores technical issues about whether one system has a safety valve, banking, borrowing, and other features that might not be fully compatible across systems.

Beyond this distribution question, it is also important to recognize that near-term emission reductions are only one piece of the climate policy objective – the larger goal is technology development and deployment to reduce emissions and mitigation costs in the future. To this end, the gains from linking must be weighed against how equalizing price across systems affects these larger policy objectives.

Question 3. International Trading
Submitter's Name/Affiliation: Jeff Sterba, PNM Resources

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

* * *

Like many other utilities, PNM is more knowledgeable about U.S. domestic proposals and voluntary programs than international activities. In looking beyond the U.S. for purposes of responding to this question, PNM observes that there may be some benefit to understanding GHG emissions reductions programs currently being pursued in other countries to determine what might work best in the U.S. (and what might not work at all).

With respect to the specific question on whether a U.S. system should be designed to eventually allow for trading with other GHG cap-and-trade systems around the world, PNM believes the priority should be to develop a viable, cost effective domestic program and as a secondary matter to look to the international arena for linkage. We would, however, encourage a provision to allow U.S. companies to invest outside the U.S. to obtain verifiable offsets. The benefits of reducing GHG emissions in the atmosphere will be the same no matter what country the emissions reductions occur. To the extent it is more cost-effective for utilities and other regulated entities to invest in projects that reduce GHG emissions in other countries it should be allowed.

While there could be significant value in pursuing an approach to link whatever system is finally adopted in the U.S. with other GHG cap-and-trade systems, we observe that the Canadian and European Union systems have taken different approaches and there is little opportunity for trading between these systems at least at present.

Question 3. International Linkage

Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

PCA believes that any U.S. system should be designed to facilitate the transfer of emission allowances among other mandatory programs in place around the world.

Question 3. International Linkage
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

PCA believes that potential benefits outweigh the potential difficulties.

Question 3. International Linkage
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Such discussions could be held among parties to the UN Framework Convention on Climate Change (UNFCCC), which is different than those nations that are parties to the Kyoto Protocol.

Question 3. International Linkage
Submitter's Name/Affiliation: Andy O'Hare, Portland Cement Association

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

This will be somewhat dependent on the ultimate design of the framework of the program, though as suggested above, the UNFCCC could provide a platform for coordination.

Question 3. International Linkage

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

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

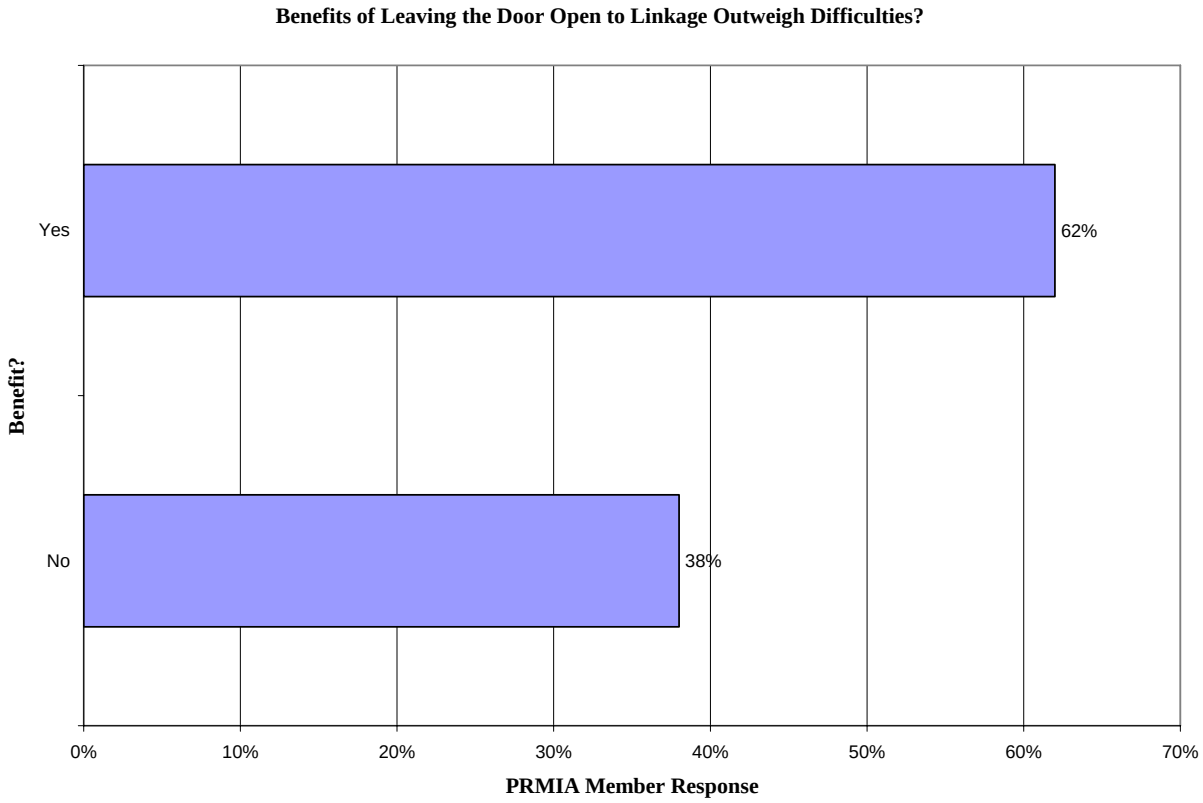
Please see answers to clarifying questions below.

Question 3. International Linkage

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

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?



Question 3. International Linkage
Submitter's Name/Affiliation: Professional Risk Managers International Association (PRMIA)

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Adopt the Kyoto Protocol and clean development mechanism. (Mason Wallick, Singapore, Singapore, Project Engineer, R. W. Beck, Inc)

Any and all countries should be linked. It does not hurt the U.S. if any country will become an ally in this topic. The U.S. should maintain an open door policy. (Andrew Warshaw, New York, U.S.A., General Member, PRMIA)

Carbon exchange arbitrage: equivalent based on ?/$ exchange rates (Florie Mazzorana, Paris, France, Director, ZELYA Energy)

Conditionally share clean energy technologies. Trade agreement based on environmental condition, just for example, if a nation had heavily depended on coal/heavy oil based power plants, then no trade with their particular energy-consuming industrial products. (Steve Yu, Kitchener / Ontario, Canada, Financial Business Analyst, Manulife Financial)

Consultation with industry in both countries (Michael Grossmann, RI, US, Manager, Atos Consulting)

KYOTO PROTOCOL HAS EXCELLENT RULES! (Ricardo Vanegas, Valencia, Spain, Financial Engineer, Free-Lance Worker)

Need to be discussed (Wilson Yeung, Hong Kong SAR, China)

Piggy back on existing trade agreements (Barney Spratt, Atlanta, GA, USA, PE, Spratt & Associates)

Question 3. International Linkage
Submitter's Name/Affiliation: Professional Risk Managers International Association (PRMIA)

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

A bilateral governmental working group (Michael Grossmann, RI, US, Manager, Atos Consulting)

An international organisation similar to UN but located outside of the US. (Mustafa Cavus, London, UK, Risk Manager)

Establish a related organization worldwide (Wilson Yeung, Hong Kong SAR, China)

The United Nations would be a major institution to promote the linkage of these systems. Additionally, a government agency at the federal level would need to be developed to coordinate linkage. (Andrew Warshaw, New York, U.S.A., General Member, PRMIA)

UN (UNIDO), World Bank. (Steve Yu, Kitchener / Ontario, Canada, Financial Business Analyst, Manulife Financial)

United nations THROUGH KYOTO COMITTEE, maybe? (Ricardo Vanegas, Valencia, Spain, Financial Engineer, Free-Lance Worker)

Question 3. International Linkage
Submitter's Name/Affiliation: Caroline Choi, Progress Energy Corporation

In responding to the questions raised, Progress Energy 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.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Currently Progress Energy does not favor formal linkage with other GHG reduction systems. Linkage of similarly structured programs would be expected to yield economic benefits by increasing the size of the allowance pool and the number of participants. However, there are a number of issues that need to be addressed for two or more systems to link and lead to benefits for the partners. These issues include: the stringency of targets and timetables, the nature of the cap (intensity-based or absolute emissions targets) and a safety valve; sources, sinks and GHGs covered; allowance distribution, treatment of new entrants and opt-in provisions; offsets; monitoring and verification; and compliance issues (banking, borrowing, penalties and enforcement). If not addressed properly, linking systems would lead to adverse impacts for some participants, particularly when the market price of emissions varies significantly between systems. This is especially true if one system, such as that in the U.S., has a safety valve and the other, such as that in the E.U., does not.

Question 3. International Linkage
Submitter's Name/Affiliation: Puget Sound Energy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Puget Sound Energy Response

A new American system does not need to be attuned to existing regimes in Canada and Europe. Countries that are participating in the Kyoto Protocol have different goals, allocation methods, and trading regimes than that proposed by NCEP and this Senate proposal. In addition, the proposed safety valve provision would allow markets outside the United States to take advantage of low-cost permits if the markets were connected.

Question 3. International Linkage
Submitter's Name/Affiliation: Puget Sound Energy

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Puget Sound Energy Response

No, at this time the complexities of linking with other countries would be great.

Question 3. International Linkage
Submitter's Name/Affiliation: Puget Sound Energy

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Puget Sound Energy does not have a position on this question.

Question 3. International Linkage
Submitter's Name/Affiliation: Puget Sound Energy

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Puget Sound Energy does not have a position on this question.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Please begin your response HERE. (no page limit)

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

The science remains unsettled with respect to the role man has played, or is playing in global warming. If we are going to "do something" about global warming, if first must be determined what, if anything, can be done to reduce or stop global warming and if it will be worth the cost. If the U.S. determines that it will act to reduce global warming by reducing greenhouse gas emissions, it must focus on technology as the key driver in accomplishing this goal.

Nations, like the U.S., that are leading users and innovators in technology have the strongest economies. Developing countries, of course, do not have the expertise with technology and therefore cannot look to this option to reduce emissions. Mandatory cap and trade programs like Kyoto, McCain-Lieberman, and Bingaman place the U.S. at a competitive disadvantage with other nations such as China and India who already have a competitive advantage in a range of key areas. The U.S. can provide leadership by example, and through an approach, that encourages other countries and engages them on a more cooperative basis. It is doubtful that few, if any, nations will agree to an approach that put them at a competitive disadvantage.

It is dangerous and naive to link our energy use to an international rationing system. Energy prices in Europe are historically higher than the U.S., and any type of link will have a damaging impact on our economy. 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?

Furthermore, most nations that have signed onto Kyoto have either not met their target, or are profiting from selling allocations to other countries. The treaty has not done anything to meet its stated purpose. The Asia Pacific Partnership, the Hagel-Pryor amendment, and the Bush Administration's policies are alternatives that will encourage countries to develop and invest in technology to reduce emissions.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

It is dangerous and naive to link our energy use to an international rationing system. Energy prices in Europe are historically higher than the U.S., and any type of link will have a damaging impact on our economy. 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?

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

A voluntary approach that encourages the development of technology (and global cooperation) to reduce emissions is the best approach to reduce emissions of carbon dioxide. The Asia Pacific Partnership and the Hagel-Pryor Amendment provide the incentives and the mechanism to reduce emissions.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Ultimately the most economically efficient GHG reductions are going to need to be adopted worldwide. But it may not be necessary to "design" a US system if there are already systems in place that are performing effectively. If a US system is designed it is strongly recommended that differences between allowance trading markets be transparent as this would help ensure as level a regulatory playing field as possible. An integrated marketplace should be similar to any commodities market, fully integrated with standardized verification systems. It is critical that a US GHG program be designed to allow (not just eventually) but immediate trading.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

As we stated at the beginning, if we are to effectively address Climate Change, it must eventually include all world economies. The door must remain open for linkage to other international programs.

Question 3. International Linkage
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

The answer is a simple one. If linkage would increase the economic efficiency and ultimate effectiveness of global climate change regulation, then the link needs to be not only allowed, but also incentivized.

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Question 3. International Linkage
Submitter's Name/Affiliation: Michael J. Murray, Director of Legislative Policy, Sempra Energy

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Most nations have commodities institutions but many lack comprehensive regulatory structures for regulating GHG emissions. Nevertheless it is possible to develop incentive mechanisms which encourage compliance by choice through energy efficiency and low cost technologically advanced options. International commodity trading mechanisms can stimulate the process but will require verifiable inventories, simplistic monitoring methods and transparent accounting. Absent those, no market-based system would work, and the incentives for technology development would be corrupted.

Question 3. International Linkage
Submitter's Name/Affiliation: Hone & Edward / Shell

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Yes.

Addressing climate change is a global issue that will require action by all countries. An open architecture approach, which encourages a global carbon market through linking with other systems, is the most positive way forward. The incentive offered by a global price for CO2 through accessible commodity instruments will encourage a wider number of participants to seek reductions. This will result in a lower overall cost for a given goal.

Question 3. International Linkage
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

While Southern Company strongly endorses the concept of a voluntary, technology-based and carbon intensity-based approach to the global climate change issue, it believes that any mandatory greenhouse gas reduction legislative proposal should be designed so that it does not preclude the possibility of linking a mandatory program in the United States with other programs throughout the world. This linkage could be as simple as accepting allowances/credits from other programs, or could include more complex linkages that include reciprocal acceptance of allowances from the other system.

The global nature of the greenhouse gas emission issue makes the reduction, avoidance or sequestration of emissions in any part of the world just as valuable as the reduction of emissions within the United States. The main benefit of linking similarly structured emissions trading programs is increased economic efficiency. Linking trading or reduction programs should yield economic benefits overall due to the creation of a market with a larger number of participants with an increased diversity of sources and emissions control costs. However, close linkage with reciprocal acceptance of allowances from other systems is likely to create winners and losers, relative to no linkage. There are a number of issues that would affect who the winners and losers are, including the stringency of targets and timetables; the existence of a safety valve; what sources, sinks and greenhouse gases are covered; the manner of allowance distribution, treatment of new entrants and opt-in provisions; the existence and use of offsets; monitoring and verification; and the treatment of compliance issues (banking, borrowing, penalties, and enforcement). If this linkage is not undertaken carefully, linking systems could lead to adverse impacts for the U.S., and could make the achievement of individual domestic targets more difficult by changing national emissions levels. In particular, linking a U.S. system with a system where allowance prices are higher than they are in the U.S. will result in higher allowance prices and higher compliance costs in the U.S. than if the two systems were not reciprocally linked.

As was discussed in our comments on an offset credit system, if the domestic U.S. program were to additionally allow for linkage to international greenhouse gas emission reduction projects, it could also serve as an incentive for other major trading partners to participate in efforts that would lower greenhouse gas emissions worldwide that would not otherwise have been realized.

Question 3. International Linkage
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Any mandatory program for carbon control will be complex, difficult and expensive to implement, whether it is global in nature or focused only on domestic actions. The need to consider actions on climate in a global context for environmental, economic and equity reasons outweigh any inherent difficulties that will arise from a linked program's design and implementation. Therefore, the door should be left open to linkage, so that there is at least an attempt to work through the potential difficulties.

Question 3. International Linkage
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

The way linkage is addressed is fundamental to any program design and needs to be considered and taken into account at the outset. Climate change is a global issue and ways must be developed to allow actions that consider the environmental, economic, trade, security and equity issues involved. Forums such as the G8 and the Asia-Pacific Partnership on Clean Development and Climate are good places to have these discussions.

Question 3. International Linkage
Submitter's Name/Affiliation: (Chris M. Hobson/Southern Company)

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Coordination is needed to ensure the development and deployment of technologies to lower the carbon intensity of economies. It would be desirable to use forums that are already focusing on this approach, such as the G8 and the Asia-Pacific Partnership on Clean Development and Climate. These forums are focused on clear, measurable technological results and are not currently burdened with time-consuming debates about rules and regulations. "Linkage" can occur through cooperative agreements like these, rather than through binding treaties. Experience is showing this approach to be desirable.

Question 3. International Linkage
Submitter's Name/Affiliation: Nigel Purvis, Jimmie Powell and Cathleen Kelly, The Nature Conservancy

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

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 any cap and trade program should be designed to leave open the possibility of linkages with carbon trading programs in other countries, particularly those in Canada, the European Union and Japan, should such a system emerge there. Linking a U.S. carbon trading program to a foreign trading scheme will likely improve market liquidity and lower overall emissions reduction costs for a minimal increase in administrative burden.

Question 3. International Linkage
Submitter's Name/Affiliation: Nigel Purvis, Jimmie Powell and Cathleen Kelly, The Nature Conservancy

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

The Nature Conservancy believes that the benefits of leaving open the possibility of linkages with carbon trading programs in other countries, particularly those in Canada, the European Union and Japan, far outweighs the potential difficulties involved. Linking a U.S. carbon trading program to a foreign trading scheme will likely improve market liquidity and lower overall emissions reduction costs for a minimal increase in administrative burden.

Overall, The Nature Conservancy believes that the challenges presented from differences in program design or implementation could be addressed and overcome in the administration of the program.

Question 3. International Linkage
Submitter's Name/Affiliation: Nigel Purvis, Jimmie Powell and Cathleen Kelly, The Nature Conservancy

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

The Nature Conservancy believes that the Congress should authorize the President to recognize foreign emissions credits from programs that meet standards adopted by the Congress. Before declaring that foreign emissions credits (such as E.U. emissions credits) are recognized for compliance with U.S. laws, the Congress should require that:

1. The foreign system has an adequate, rigorous system of verification and enforcement.
2. The linkage does not reduce the level of emissions reductions required under U.S. law.
3. The economic or environmental benefits of linking emissions trading programs clearly outweigh any increase in administrative burden or cost.

The Congress should also instruct the President to negotiate agreements with foreign governments where U.S. emissions reduction credits are recognized by foreign entities and vice-versa, provided that they meet Congressional standards adopted under U.S. climate regulations. These bilateral emissions trading agreements should take effect without further Congressional review.

Question 3. International Linkage
Submitter's Name/Affiliation: Nigel Purvis, Jimmie Powell and Cathleen Kelly, The Nature Conservancy

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

For full two-way trading, the Nature Conservancy believes an independent entity would be required to coordinate emissions credit trading between U.S. and foreign carbon markets. Such an institution would be responsible for ensuring that all trades across jurisdictions complied with the relevant discount factor (if any) and were not double counted as emissions reductions in both the United States and abroad.

Alternatively, the United States could unilaterally allow one-way carbon trading between a foreign emissions trading program and the U.S. carbon market. In such a system, the U.S. Congress would allow regulated entities to present credits from pre-approved foreign emissions trading programs (such as the European's Union's Emissions Trading Program) to meet the requirements domestic climate change regulations. The United States would want to establish a process to ensure that all credits traded were real and verified emissions reductions that were not double counted. The major benefit of this program would be that it requires no international negotiations, only modifications to U.S. law.

The first step in the process would be for the Congress authorize the President to immediately recognize foreign emissions trading allowances (such as E.U. emissions credits) for compliance with U.S. law provided that:

4. The foreign system has an adequate, rigorous system of verification and enforcement.
5. The linkage does not reduce the level of emissions reductions required under U.S. law.
6. The economic or environmental benefits of linking emissions trading programs clearly outweigh any increase in administrative burden or cost.

Question 3. International Linkage
Submitter's Name/Affiliation: Margo Thorning, American Council for Capital Formation

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Response to White Paper Question 3 by Dr. Margo Thorning, Senior Vice President and Chief Economist, American Council for Capital Formation

Answer: Many cap and trade proponents would like to develop a system that would link the US to other countries including the European Union's Emission Trading System or the Canadian Large Final emitter system. However, as a new study by Dr. David Montgomery of CRA International shows, a global emission trading system is not workable. (See pages 65-79 at http://www.iccfglobal.org/research/climate/climate-change-book.html.)
Emission trading will work only if all the relevant markets exist and operate effectively; all the important actions by the private sector have to be motivated by price expectations far in the future. Creating that motivation requires that emission trading establish not only current but future prices, and create a confident expectation that those prices will be high enough to justify the current R&D and investment expenditures required to make a difference. This requires that clear, enforceable property rights in emissions be defined far into the future so that emission rates for 2030, for example, can be traded today in confidence that they will be valid and enforceable on that future date.

The international framework for climate policy that has been created under the UNFCCC and the Kyoto Protocol cannot create that confidence for investors because sovereign nations have different needs and values. Therefore, it seems likely that the ETS system, which the EU is trying to implement, will fail to spread to other parts of the world and will eventually be replaced with a more practical approach to climate change policy.

Another difficult challenge in the linking of international GHG trading systems stems from the large potential wealth transfers. For example, if global emissions were 25 billion metric tons CO2 (approximately today's level of total emissions), valuing those emissions at $20/Mt CO2 (below recent CO2 prices in the EU-ETS) implies a global market value of $500 billion/year. This would then have to be allocated among countries, to say nothing of allocating them within countries. It would be a huge and complex political process to allocate that amount of resources (wealth) among the countries of the world. Any allocation process will result in "winners" and "losers" and the best judge has always been the free market rather than governments.

Perhaps an even more difficult problem in making an international allocation system work stems from widely divergent population trends that would require continuous renegotiation of caps and allocations among countries. For example, over 2002-2025, population growth in the US (21%), India (29%), and China (11%) vastly exceed populations change in Western Europe (1%) and Japan (-3%) (Energy Information Administration projections from the *International Energy*

Outlook 2005.) These divergent population trends raise serious practical questions about the political viability of linked trading systems, whatever their theoretical desirability.

Question 3. International Linkage
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

TXU is opposed to the mandatory regulation of greenhouse gas emissions, whether in the form of a carbon tax, a cap-and-trade program or any other type of mandatory emissions controls. We believe that there would not be any real environmental benefits from such a program and that mandatory controls would have adverse effects on the nation's economy, and on jobs, lifestyles, and financial well-being.

We question the entire premise and effectiveness of a mandatory, market-based greenhouse gas program in the United States. The most famous and extensive example of this model is the Kyoto Protocol, and this treaty has not resulted in any meaningful emissions reductions among its parties. Even if Kyoto's average emissions reductions target of 5.2% below 1990 levels among industrialized countries were achieved, this result would have almost no effect on climate change. We wonder why the United States Congress would consider adopting this flawed model. TXU strongly opposes the mandatory control of greenhouse gas emissions and prefers a voluntary, technology-based approach to address climate change.

By placing a cap on carbon without ensuring our global competitors and other major emitters also do so, the United States is merely setting itself up for economic disaster. A cap on U.S. emissions will not significantly address the problem of climate change and will harm our economy in the process. The lack of a global cap will ensure that industry will relocate offshore to jurisdictions that currently do not regulate greenhouse gases. Global emissions would almost certainly *increase* under this scenario compared to the status quo because carbon emissions intensity in developing countries is significantly higher than in the United States. Technology and processes are less efficient in these areas, even when U.S. companies employ the majority of their own standards and equipment.

The problem of climate change deserves a global solution. The U.S. should not engage in selective regulation of economic sectors unless the rest of the developed and developing world imposes the same requirements. All countries must participate by regulating emissions—all countries must pay the price to receive the benefit.

Question 3. International Linkage
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

Linkages among national cap-and-trade systems should be created if that will facilitate and reduce the costs of abating emissions. However, a non-global and non-comprehensive approach will not produce any significant environmental effect and will harm the domestic economies of those nations that choose to self-regulate.

Given all of these factors, TXU believes that the best way to address climate change is to adopt a voluntary, technology-based approach that involves both developed and developing countries. We support the efforts of the six-nation Asia-Pacific Partnership for Clean Development and Climate which provides incentives for the development of clean technologies and for developing countries to begin to abate their emissions. The developing world is growing at a breakneck pace and its greenhouse gas emissions are expected to overtake that of the developed world within twenty years. The developing world must be a part of the solution, and if they continue to refuse to adopt mandatory caps, then a technology-based approach is the only viable solution.

Question 3. International Linkage
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

TXU strongly believes that the most appropriate method to deal with the problem of global climate change is to involve both developed and developing countries with a voluntary, technology-based approach. The Asia Pacific Partnership for Clean Development and Climate provides a promising "linkage" approach and offers a greater likelihood that developing countries will reduce their greenhouse gas emissions than under any existing or foreseen cap-and-trade system. Developing nations are highly unlikely to undertake binding commitments to reduce their emissions so the only way to achieve any measurable reductions from this growing and significant portion of global emissions is to implement a program whereby more efficient and emissions reducing technologies are deployed throughout the world.

Because of the environmental and economic inefficacy of a mandatory cap-and-trade program existing in only a few countries, TXU opposes any U.S. cap on greenhouse gas emissions and favors the current voluntary and research-based approach adopted by the Administration.

Question 3. International Linkage
Submitter's Name/Affiliation: Shawn Glacken, TXU Corp.

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

TXU believes that the approach adopted by the United States, Japan, China, Australia, South Korea and India with the Asia-Pacific Partnership for Clean Development and Climate provides a model for a future global system. This approach will successfully harness the talents, creativity, ambition and financial and human resources to research, develop and deploy new technologies to address the problem of global climate change. Industrialized country governments will participate by helping to fund, prioritize and deploy these technologies, and developing country governments will ensure that these technologies are adequately disseminated throughout their economies. Global carbon emissions intensity will drop far faster under this approach than under any mandatory cap-and-trade system that omits more than half of the world.

A voluntary, technology-based approach is the only viable methodology for tackling global emissions. Countries that adopt domestic caps may assuage their guilt but seem to be ignoring the fact that their unilateral emissions reductions are doing very little to address the global nature of climate change. Domestic economies are thus impaired for naught.

TXU encourages the Committee to consider the real costs and benefits of a cap-and-trade program, even one based on emissions intensity. The program should be compared to the attractive alternative of the Asia-Pacific Partnership. We believe the Partnership will yield more significant environmental benefits than the cap, and will actually stimulate the global economy in the process, rather than damage it.

Question 3. International Linkage
Submitter's Name/Affiliation: Union of Concerned Scientists

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

There are potential significant advantages to both U.S. companies and the environment to designing a U.S. cap-and-trade system that can be linked to systems in other countries. The advantages to industry include lowering the cost of complying with their domestic obligations through the use of credits from other countries, as well as the ability to integrate emissions reduction strategies within individual companies to comply with their obligations in the U.S. and other countries. The advantage to the environment is that lowering the compliance cost of initial emissions reduction obligations increases the political feasibility of obtaining the deeper cuts in emissions that will be needed to achieve reasonable atmospheric stabilization goals.

It should be noted that the European Union has stated that it will link its Emissions Trading System only with countries that have ratified the Kyoto Protocol. If a U.S. system was developed that was roughly equivalent in terms of stringency of effort, as well as other elements such as monitoring and verification, it is likely that this position would be modified to allow linkage even absent U.S. ratification of Kyoto. But there are several aspects of the proposal put forward last year by Senator Bingaman (the Climate and Economy Insurance Act of 2005) that could make such linkages more difficult:

- The use of an intensity-based approach to setting emissions targets, as opposed to the absolute limits set in Europe and other industrialized countries;
- The fact that the limits set in the bill would slow the projected increase in U.S. emissions, but not lead to reductions below current levels, much less reductions from the 1990 baseline used by other industrialized countries;
- The use of a price cap, set at a very low level ($7 per metric ton), which means that companies would likely meet at least part of their obligations by buying allowances from the federal government that don't represent actual reductions in carbon emissions. By comparison, the current price of allowances on the European carbon market is about $30 per ton.

The issues involved in linking a U.S. system with activities in developing countries such as India and China are somewhat different, given that these countries have not taken on absolute emissions limits. There are certainly cost advantages to U.S. companies in being able to use investments in developing country projects to meet part of their domestic obligations. It is important, however, to ensure the environmental additionality of such project-based reductions, which is not a simple exercise, as experience with the Kyoto Protocol's Clean Development Mechanism has demonstrated. It would be essential that any such use of developing country project-based credits be compatible with the evaluation and certification standards being used in the CDM.

Question 3. International Linkage
Submitter's Name/Affiliation: Union of Concerned Scientists

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Union of Concerned Scientists

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name/Affiliation: Union of Concerned Scientists

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Please begin your response HERE. (no page limit)

Question 3. International Linkage
Submitter's Name: Sean Casten and Kenneth Colburn
Submitter's Affiliation: United States Combined Heat and Power Association

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

In a word, yes. Greenhouse gases are unique amongst pollutants because their impacts are truly global. A ton of carbon emitted in the United States affects climate on a global basis, just as a ton emitted in other parts of the world affect US climate. Since multinational corporations – who must be responsive to local laws at their disparate operations – will bear the brunt of the responsibility for carbon reduction, economic efficiency provides a strong argument for linking all global cap and trade markets. If carbon markets are not linked, emitters will have an incentive to shift their operations to jurisdictions with lower costs of greenhouse gas reduction, rather than globally reduce their greenhouse gas footprint. This could effectively create a "race to the bottom" where emissions move to low cost markets, possibly at the expense of absolute reductions.

This issue of "leakage" – in the parlance of cap and trade systems – is very real, and of the utmost importance to minimize. Linking US cap-and-trade markets to other global markets provides an important way to minimize this potential. Generically, a primary goal of any carbon market ought to be the recognition that "a ton is a ton is a ton". Regardless of technology, market sector or geography, a ton of carbon emitted or reduced has equivalent global impacts and therefore ought to have an equivalent financial value within the context of any cap and trade system. Allowing financial trading of carbon credits amongst all global greenhouse gas markets helps ensure that this goal is realized, even in cases where measurement, verification, and permanence uncertainties may warrant discounting or differing "exchange rates" for greenhouse gas transactions.

Conceptually, the linking of systems between countries should be easy, reflecting commonly accepted carbon quantification protocols, registration or serialization (to avoid double counting) of reductions, standardized financial transactions, and appropriate legal processes (contracts, risk, recourse, etc). Procedurally, however, these tools evolve only as the markets which they serve emerge, so it is not surprising that adequate measurement and verification protocols, common registries, transaction processing, and legal processes are not yet universal. These tools are advancing rapidly outside the U.S., however, and the most effective way for us to advance both tool development and U.S. interests in the processes and procedures being developed (much of it intellectual property) is for the U.S. to get fully engaged in a global cap and trade carbon market. Once appropriate carbon quantification, accounting, and legal structures are developed and accepted, the actual coordination of different cap and trade systems will easily be accomplished through existing financial markets.

Question 3. International Linkage
Submitter's Name: Sean Casten and Kenneth Colburn
Submitter's Affiliation: United States Combined Heat and Power Association

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

We have no further comments beyond those outlined above at this time.

Question 3. International Linkage
Submitter's Name: Sean Casten and Kenneth Colburn
Submitter's Affiliation: United States Combined Heat and Power Association

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

We have no further comments beyond those outlined above at this time.

Question 3. International Linkage
Submitter's Name: Sean Casten and Kenneth Colburn
Submitter's Affiliation: United States Combined Heat and Power Association

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

We have no further comments beyond those outlined above at this time.

Submitter: Raymond Bracy, Vice President for Corporate Affairs, Wal-Mart Inc. 702 SW 8th St., Mitchell Building Bentonville, AR 72716-0130 E-mail: Raymond.bracy@wal-mart.com Ph: 479-277-0938

RESPONSE OF WAL-MART TO QUESTION 3: Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

Wal-Mart believes that a U.S. cap-and-trade program for GHGs should leave open the opportunity for integrating with other cap-and-trade programs around the world and should further leave open the potential for the creation of a U.S. carbon market that would become a leading exchange for the trade of GHG credits. Wal-Mart appreciates the myriad questions that would have to be answered to effectuate these linkages and to foster a vibrant GHG market in which the U.S. is an active participant. Wal-Mart will be happy to work with Congress to develop legislative language that will not foreclose opportunities for global participation.

Like many other large U.S.-based companies, Wal-Mart is a global company, with a presence in 16 countries including the United States. Wal-Mart acts globally on environmental issues by gathering ideas from divisions and units everywhere and undertaking efforts to reduce emissions world-wide. Importantly, Wal-Mart is actively developing programs to transfer technologies to its suppliers world-wide, including in China, so that a greater number of companies may increase efficiency and reduce emissions. From Wal-Mart's perspective as a global company, it makes sense to encourage activity throughout the world that will lead to reduced greenhouse gas emissions. Wal-Mart believes that linkages with international greenhouse gas programs can serve to increase incentives to reduce greenhouse gas emissions.

Question 3. International Linkage
Submitter's Name/Affiliation: Carter Lee Kelly/Waste Management, Inc.

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

WM was the first environmental services sector company to join the California Climate Action Registry, and is also a founding member of the Chicago Climate Exchange (CCX), the nation's first voluntary industry market for trading of GHG reduction credits. WM has committed to a 1% per year reduction in its climate change baseline gas emissions from 2003 through 2006 as part of its participation in CCX. WM viewed the CCX program as an opportunity to learn how to operate under a cap and trade program. In exchange for voluntary GHG reductions, we have been able to develop and implement methods for inventorying GHG emissions and reductions, and calculate, document and verify them so that we can present credible, understandable information to the public and to potential buyers of our credits.

CCX is a microcosm of a market trading system where we can learn how to market and sell our emissions reductions credits to other entities. In turn we have been able to share what we learn with policymakers who are contemplating or establishing voluntary and even mandatory programs around the country including California, New Mexico, Arizona, Massachusetts, and the Northeast Regional Greenhouse Gas Reduction Initiative. Should Congress design a mandatory, market-based GHG cap and trade system, it should look to the successful CCX system, which is multi-sector, transparent, rules-based and verifiable, as a system model or as the trading platform for a national cap and trade program.

Another key issue that Congress should address in designing a national GHG program is the existence of state and regional GHG programs and the need for transition policies to ensure that entities that have invested in GHG emissions reductions receive full credit for their beneficial actions. Congress should ensure that those entities already making voluntary reductions will be recognized and receive full credit for early action.

In developing a cap and trade program, Congress should include a robust, flexible GHG offsets program that achieves real, surplus, and verifiable emissions reductions in all six gases. A flexible offsets program offers the most cost-effective means to promote diverse compliance options. Flexibility should extend to the location of the offset projects (anywhere in the world), the type of offset projects (any that are surplus and verifiable), and the amount of offsets a regulated entity can use to achieve compliance with emission limits (unlimited).

WM and the municipal solid waste (MSW) management industry have already made great strides in reducing their impacts on the environment by reducing the release of GHG emissions. As the Committee continues its deliberations on the elements of a national greenhouse gas program, we urge the Committee to develop GHG inventory and offsets policies that recognize:

- Modern landfills destroy methane through landfill gas collection and landfill cover systems; and landfill gas to energy systems are significant sources of renewable energy;

- Waste-to-energy and open-loop biomass plants provide renewable "green" energy, offsetting emissions from fossil-fuel derived electricity, and offsetting methane emissions from uncontrolled landfills;

- The recycling industry generates significant GHG emissions reductions and energy savings by beneficially reusing glass, paper, aluminum and other materials; and

- Modern landfills are sources of significant GHG emissions reductions through sequestration of large volumes of carbon.

Congress should ensure that any national GHG program it develops attribute carbon sequestration in landfills to the point source where sequestration occurred—the landfill. A number of international and domestic protocols including the Intergovernmental Panel on Climate Change (IPCC), the U.S. Environmental Protection Agency (EPA), the Oregon Climate Trust, and the California Climate Action Registry recognize carbon storage in landfilled material as a sink in calculating carbon emissions inventories. These protocols recognize that when wastes of a biogenic origin are deposited in landfills and are not completely decomposed, the carbon that remains is effectively removed from the global carbon cycle, or sequestered.

For example, the EPA has published reports that evaluate carbon flows through landfills to estimate their net greenhouse gas emissions.[1],[2] The methodology EPA employed recognizes carbon storage in landfills. In these studies of municipal solid waste landfilling, EPA summed the GHG emissions from methane generation and transportation-related CO_2 emissions, and then subtracted carbon sequestration (treated as negative emissions). The projected national average of net GHG emissions for landfills was minus 0.02 MTCE/Wet Ton, showing that landfills are "carbon sinks" (USEPA 1998, Exhibit 7-6).

These same methodologies that recognize carbon storage in landfills are also employed by EPA in calculating the greenhouse gas emissions related to landfilling hardwood, yard trimmings and food scraps for the Inventory of U.S. GHG Emissions and Sinks.[3] In EPA's inventory for 2003, landfills are reported to have nationwide methane emissions of 131.2 Tg CO_2 equivalents (Table 8-1). For the same year, reductions (storage) of carbon dioxide in the form of landfilled hardwood and landfilled yard trimmings and food scraps are reported to amount to 155 Tg CO_2 equivalents (Table 7-5) and 10.1 Tg CO_2 equivalents (Table 7-1) respectively. This

[1] USEPA 1998. Greenhouse Gas Emissions From Management of Selected Materials in Municipal Solid Waste. EPA 530-R-98-013

[2] USEPA 2002. Solid Waste Management And Greenhouse Gases A Life-Cycle Assessment of Emissions and Sinks, 2nd Edition. EPA530-R-02-006

[3] USEPA 2005. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2003. EPA 430-R-05-003

demonstrates that by using EPA procedures and attributing carbon storage to the landfill, the national greenhouse gas footprint for landfills in 2003 was estimated to be minus 33.9 Tg CO_2 equivalents, or a net carbon sink. We also note that in both instances, the national average net emissions for the landfill sector were well below the "de minimis" level (3%) that the DOE 1605(b) guidelines use to allow reporters to exclude from their inventories, emissions that are comparatively small.

Life-cycle analyses of waste management practices offer further support for the premise that landfilling biogenic carbon can result in net greenhouse gas reductions. EPA's Municipal Solid Waste Decision Support Tool (referenced in WM comments on Question Two), a life-cycle analysis tool that was developed to help communities optimize the environmental benefits of their waste management practices, as well as to support the EPA Climate Leaders program, includes a calculator for estimating the carbon storage potential of landfills.

Although carbon storage in forests, soils and landfills clearly has a strong influence on inventorying net GHG emissions, the exact accounting methods that should be used have not yet been addressed uniformly across protocols, as scientific and policy questions remain to be resolved. Nonetheless as we have noted, EPA currently includes estimates of carbon storage in landfills in its national GHG inventory. What is problematic for the waste management sector is that EPA has chosen to account for carbon storage of landfilled materials under the forestry sector rather than the waste sector in its national inventory reporting. Congress should ensure that any GHG program it designs attempts to allocate net carbon emissions to the point sources at which they are achieved.

The IPCC review of EPA's draft 2004 U.S. GHG Inventory takes EPA to task for similarly diverging from the point source approach, and recommends that EPA account for carbon storage of landfilled biomass in the waste sector rather than the sector associated with forestry, thus ensuring that estimates are fully and directly connected with the model on landfill emissions (UNFCCC Secretariat 2005). While the IPCC rules do not currently address carbon storage in landfills, this issue is being considered in the development of new guidelines for 2006. Among the items being evaluated is the appropriateness of accounting for carbon storage associated with hardwood products disposed in landfills within the waste sector rather than the forestry sector. [4]

In the course of evaluating the carbon flows within landfills, most methodologies discuss the inherent uncertainties and difficulties in developing a detailed landfill emission profile. IPCC, EPA and academic studies alike, delineate the uncertainties associated with modeling estimates of waste composition and mass, methane generation potential, gas collection efficiency and methane oxidation that occurs in daily, intermediate and final landfill cover. These measurement difficulties coupled with the acknowledgement that carbon sequestration renders many landfills as carbon sinks, has resulted in many domestic and international protocols and programs either ignoring landfills as insignificant sources of GHG emissions, or treating landfills as sources of

[4] Pingoud, K. et al., "Approaches for Inclusion of Harvested Wood Products in Future GHG Inventories Under the UNFCCC, and their Consistency with the Overall UNFCCC Inventory Reporting Framework," *IEA Bioenergy* (July 13, 2004). http://www.joanneum.ac.at/iea-bioenergy-task38/publications/

emissions reductions. We respectfully recommend that Congress do the same as it contemplates a national market-based GHG cap and trade program.

Question 3. International Linkage
Submitter's Name/Affiliation: Jonathan Pershing, World Resources Institute

Should a U.S. system be designed to eventually allow for trading with other greenhouse gas cap-and-trade systems being put in place around the world, such as the Canadian Large Final Emitter system or the European Union emissions trading system?

In this response we present a rationale for the following:

1. Linking emission trading systems is desirable where possible, but can be done successfully only where a number of conditions are satisfied.

2. These conditions are principally those of mutual confidence. Market participants need to have faith in the relevant monitoring, verification and legal regimes in each system. There is no need for an overlying institutional structure.

3. These criteria suggest that linking with emission trading systems in developed countries such as the European Union and Canada is both desirable and, depending on the design features chosen in a U.S. system, feasible. Conversely, for the foreseeable future the emergence of cap-and-trade systems in countries such as China and India that can be linked to a system in the U.S. is both implausible and potentially undesirable. The use of project-based mechanisms, however, may allow low-cost emission abatement options in these countries to be exploited.

Clarifying Question 3a:

- Do the potential benefits of leaving the door open to linkage outweigh the potential difficulties?

Linking with other emission trading systems is *a priori* highly desirable.

The same principle applies to emission trading as to other kinds of trade: the more the better. In particular, there are two main reasons to lean towards linking a U.S. emission trading system with foreign counterparts:

1. Economic

Many studies show that a wider group of participants in an emission trading system will tend to reduce the cost of meeting a given emission reduction target. This cost saving will be greatest where the participants face very different marginal abatement costs. For example, when the U.S. Ozone Transport Commission (OTC) designed a cap-and-trade program for NOx emissions, the primary target for regulation was electricity generators (the largest stationary source of emissions). The OTC decided to also include industrial facilities such as petroleum refineries and pulp and paper mills. These sources displayed flexibility in a wide range of compliance strategies.[1] Industrial sources became net sellers of allowances, suggesting that they had lower marginal control costs than electricity generators. By including industrial sources, the NO_x trading program was more flexible, achieved greater reductions in emissions, and lowered the overall program costs.[2]

Linking emissions trading systems internationally is likely to produce significant cost savings. The reason for this is straightforward, and underlies the rationale for all trade: different participants will face different costs of making cuts in the short, medium and long terms. Furthermore, these differences are extremely hard to identify in advance. The experience of the European Union is salutary: before implementing its Emission Trading System (ETS), the EU undertook an exhaustive analysis of marginal abatement costs across a huge range of industry sectors in a multi-year study that cost millions of Euros. The sectors it predicted as making major contributions to emission abatement (e.g., Germany's coal sector) have been overtaken by facts on the ground (rising natural gas prices) while other sectors have identified cheaper cuts than forecast. Inclusion of more players in more sectors helps to increase innovation while keeping costs down.

2. Political

Climate change is a global problem requiring international collaboration in finding solutions. The emergence of a clear U.S. policy that actively links to trading systems elsewhere will go a long way to reestablishing the U.S. as a leading participant in implementing climate solutions. Linking emission trading systems will also tend to equalize the abatement costs faced by American companies with those of their competitors in other participating countries such as

Europe and Japan, thus significantly reducing competitiveness concerns.

It is worth noting that the legislation implementing the EU emission trading system very specifically leaves the door open to links with other emission trading systems. Furthermore, the EU explicitly removed any reference to the Kyoto Protocol in its relevant text (the so-called "Linking Directive"[3]), thus signaling its willingness to link to any similar system that might emerge in the U.S.

Clarifying Question 3b:

- If linkage is desirable, what would be the process for deciding whether and how to link to systems in other countries?

Linking is possible even between quite different emission trading systems. The most important issues are not ones of strict harmonization but of mutual confidence.

The nuts and bolts of a market-based system are the monitoring and reporting of emissions inventories by the companies participating; the verification of these inventories by credible third parties; and recourse to a credible legal system that will enforce emission limits and punish fraud. These institutional underpinnings are, in one form or another, essential for any traded market. However, in the case of emission trading this importance is magnified because the very commodity being traded owes its existence to government mandate. If companies suspect that enforcement of the emission caps will be weak or that any government will be tempted to flout the rules by issuing surplus allowances, the incentive to use trading as a means of making cleaner investment decisions will be greatly diminished.

These factors are vital for establishing a functional market-based system, but in the U.S. and other developed countries some factors can be taken for granted. Linking to the EU ETS for instance means linking to a system in which the monitoring and verification are robust and the legal enforcement of caps is likely to be reliable. These conditions are less likely to be found in some developing countries or economies in transition (see discussion of "Emission trading systems in developing countries" below.)

Where this mutual confidence exists, most specific features of the systems do not need to be harmonized in order for a successful linking to be possible. The systems can cover different sectors, include different gases and employ different monitoring methodologies.

There are a few **essential** components that either need to be harmonized, or will be de facto harmonized automatically if systems are linked. These include compliance penalties, price caps and a common unit of exchange. If the two systems cover countries that engage in cross-border trade in electricity with each other, this imposes some design constraints.

There are some features for which harmonization is **helpful but not essential.** Differences in these features between systems can add significantly to cost and complexity, but do not preclude linking. Notable among these is the use of intensity targets.

Finally, some features present no technical difficulty but are so important that some degree of harmonization might prove **politically necessary.** The most significant issue here is the stringency of the regime.

Features that must be compatible:

Compliance

The most important aspect of two linked trading systems that needs to be coordinated is the compliance regime. In a linked system that combines different compliance regimes, the most lenient regime effectively applies to all.

The simplest way of applying an incentive to comply with emissions targets is to set a financial penalty for non-compliance. The EU ETS applies a financial penalty of 40 Euro (rising to 100 Euro from 2008) for each ton of CO_2 not covered by an EU allowance, as well as restitution of the excess emissions with an equivalent cut the following year.[4] If the EU were to link its scheme with one in which the penalty was only 10 Euro, then traders would ensure that emissions were matched with allowances in the EU and any non-compliance would migrate to the more lenient regime. In effect, the non-compliance penalty for the entire system would be 10 Euro.

This is fairly simple to see in the case of a fixed price penalty, but the complexity rises greatly for other forms of compliance and incentive mechanisms. In the case of the UK ETS,[5] participants who opted into the program were given an 80% reduction on their payments under the "Climate Levy" (a carbon tax). The penalty for non-compliance is the forfeiture of that reduction. In the case of the Danish CO_2 Quota Act, which only covers the power sector, a non-compliance financial penalty of DKK40 (around $6) per tonne of CO_2 applies, a relatively small sum. However, a Danish company in non-compliance also becomes ineligible to bid for government contracts – a far greater incentive to ensure compliance. However, while these compliance mechanisms may be effective within a single country and its trading system, they have no effect on companies in other countries. Therefore, if trading systems are linked, these compliance mechanisms do not cross over.

Price Cap

In the interest of limiting the cost of an emissions trading system, a debate arises over whether to use price caps on allowances prices. In the case of linked ETS, the lowest price cap that applies in any of the systems will effectively apply to all of them. The reason for this is similar to that for compliance penalties above: an efficient trading system will tend to equalize the price for all participants, and the option to buy more allowances at a given price will prevent the market price from rising above that level across the system. Consequently, price caps would have to be harmonized by policy makers; otherwise, the market would essentially harmonize the price caps automatically.

Traded electric power

Power generation can be covered in an emissions trading system either directly (by applying emission caps to generators) or indirectly (by allocating emissions to the consumers of the

electricity). A common way of dealing with power sector emissions is necessary if there is cross-border trade of electricity between the countries covered by the trading systems. This is necessary to avoid double-counting the emissions: once at the point of generation, and again at the point of consumption. Thus, trading systems in the U.S. and Canada, which have significant cross-border flow of electricity, would need to treat electricity in the same way, but the EU and the U.S. could afford to have separate approaches.

Features for which harmonization is helpful but not essential:

Beyond the short-list of essentials, there is a large number of features that can differ between linked systems. These differences may affect economic efficiency and/or environmental integrity, but do not necessarily preclude linkage. These have been explored extensively elsewhere,[6] but we highlight some of the most prominent issues here:

Use of absolute emission targets

In particular, a system based on intensity targets can trade with one based on absolute emission caps, but doing so adds greatly to complexity. The UK has experience with such linking, and this was due to the need to incorporate industry agreements based on intensity within a new emission trading system. A "gateway" was put in place to prevent inflation of emissions in those sectors covered by absolute caps. In order for trading between the two groups to take place, intensity performance is first converted into absolute tons of CO_2. These tons can then be traded, but the gateway prevents a *net* flow of emissions from the intensity-based sector into the sector covered by an absolute cap. These intensity-based metrics are being phased out in the UK.

Inclusion of project offsets

It is possible to exclude certain project types from one system that are allowed in another. For instance, the EU system allows the trading of credits from the Kyoto Protocol's Clean Development Mechanism (CDM), but this would not automatically mean that these credits could be traded into a U.S. system. In practice, however, an exclusion of the credits in a U.S. system would be notional only, as CDM credits could be used in the EU to "free up" allowances that could be traded into the U.S. system. Harmonization would thus increase transparency and efficiency, but not fundamentally affect prices or environmental integrity.

Registries

An electronic registry is needed to track the ownership of allowances within the trading system. Multiple registries can serve this function, but the more harmonization between them the better. However, it is worth noting that the EU member states are employing a number of different registries. Certainly, linking two trading systems would not require the merging of their registry.

Features that may be politically necessary:

Stringency

The relative stringency of the targets in each system does not affect the technical performance of the system but may preset a political obstacle to linking systems. In principle, linking two systems with widely diverging allowance prices could provide economic benefits to players in both systems. However, if the result of linking two systems is that there is a large net financial flow in one direction (and flow of allowances in the other direction), this may be politically challenging for both the "buyer country" and the "seller country."

For the buyer country, the political challenge may seem counterintuitive. After all, for companies in the more ambitious and expensive system their cost of compliance will go down (they will get cheaper allowances from the seller country). However, emission trading makes costs explicit, and experience in the EU suggests that governments attribute the costs to the emission trading system itself. Where these financial flows are from one country's companies to their international competitors, the system may be (negatively) perceived as a form of international subsidy. Also, the environmental community in the "buyer country" is likely to see the linking as undermining the integrity of their system.

For the seller country, the potential backlash to linking is clear. On its own, the seller country enjoys a relatively low cost of allowances – a reflection of the low stringency. As in any emissions trading system, some percentage of the regulated companies will choose to rely on the market and buy allowances as their primary strategy for compliance. If the system is linked to a more stringent and expensive trading program, however, the more stringent program will immediately begin drawing allowances from the other until the prices reach equilibrium. As a result, some of the companies in the less stringent system will be faced with higher compliance costs, and these costs may get passed on to their consumers. On the other hand, companies who were positioned to be sellers in the less stringent system would get a higher price for their allowances.

Clarifying Question 3c:

- What sort of institutions or coordination would be required between linked systems?

Linking emission trading systems needs very little in terms of process or supervision.

Assuming that the basic conditions of linking are met and there are no insurmountable political obstacles, the process itself is simple. The regulatory authority responsible for each system needs only to agree to recognize the allowances of the other for the purposes of fulfilling commitments with in its own system. This recognition does not even have to be mutual. This has already been proposed in the RGGI system: participants in RGGI are permitted, under certain circumstances, to surrender EU allowances against their obligations.[7] For this, no formal approval from the EU is necessary since any legal or natural person can hold EU allowances. A call to an emissions broker will be enough to secure a supply of allowances. Since anyone can buy EU allowances, the EU did not itself have to be involved in this decision. However, efficiency and political cooperation will be best served in the future by mutual recognition.

In the period to 2012, the recognition of U.S. allowances in the EU (or any other party to the Kyoto Protocol) is more complex. The EU ETS contributes directly to the compliance of EU countries with their Kyoto targets. EU allowances are "tracked," or mirrored, by so-called "assigned amount units" (AAUs), the emissions trading currency under the Kyoto Protocol. Allowances bought from a U.S. system would not provide such AAUs and would compromise the ability of EU countries to meet their obligations under the Kyoto Protocol. In the longer term this problem need not apply.

As this suggests, linking emission trading systems does not imply the creation of new governing bodies or other oversight. The essential ingredient is confidence in each country's monitoring, verification and legal systems. In practice this is likely to restrict such linking in the first instance to systems in OECD countries, but this can be evaluated on a case-by-case basis. In practice, a simple memorandum of understanding between the respective regulating bodies could be all that is necessary.

Emission trading systems in developing countries

The white paper by Senators Domenici and Bingaman refers to "a trading system that includes emission reductions in key developing countries such as India and China" as a desirable objective. This formulation covers a number of potential options, but here we will briefly discuss the application of market-based system in these countries. There is little prospect of implementing an ETS in either India or China for the near future, although there are clear prospects for engaging with these countries on meaningful emission reductions[8]. The barriers to implementing an ETS in China or India are technical, institutional and political.

From the technical point of view, emissions in developing countries are growing at a pace too

rapid and unpredictable to form the basis for enacting a Kyoto-style "cap" on national emission levels.[9] For example, models project that India's emissions in 2025 will be somewhere between 73 and 225 percent above today's levels. In China, the difference between the low and high estimates of emissions growth (50 and 181 percent, respectively) amounts to 1,025 million tonnes of carbon, a quantity that exceeds the combined current emissions of India, South Korea, Mexico, South Africa, and Brazil.[10] Under conditions of such uncertainty, at what conceivable level would a country "cap" its emissions? Formulating caps under this level of uncertainty amounts largely to a guessing game with enormous environmental and economic consequences.[11] The uncertainty problem, however, is much less acute in industrialized countries (many of which are already implementing fixed targets under the Protocol), where underlying economic conditions are more stable and can be more accurately forecasted.[12]

Second, the institutional, legal and technical capacities discussed above may not exist in many developing countries. New laws and regulations that cover the entire economy may be needed. Countries must have the ability to exercise regulatory control over their private and public entities and must apply appropriate sanctions in cases of non-compliance.[13] Perhaps most significantly, credible emission caps require quantitative precision, and thus high-quality monitoring tools and robust national GHG inventories that are developed in accordance with international standards. This would be a major challenge as, to date, almost all developing countries have reported difficulty in compiling their emissions inventories under the United Nations Framework Convention on Climate Change.[14]

Politically, India and China have made clear on numerous occasions[15] that they are not prepared to take on emission caps. It is true that one reason for this has been the reluctance of the U.S. to commit to reductions itself, but even a shift in US policy should not be expected to change policy in India or China in the near term. These countries point to their far lower levels of economic development and far lower per-capita emissions[16] as a reason for this reluctance. Most hopes for engaging them in an ETS spring from the idea of allocating surplus allowances (so-called "hot air") as an inducement. Experience with this approach, which was used to bring Russia and other post-Soviet economies into the Kyoto Protocol, is not promising. The political prospect of "reaching" climate goals by making large financial transfers to Russia is not one that appeals to many Kyoto Parties, and it is unlikely to be much more tempting in the case of China.

It is important to stress that this does not mean that emission abatement potential in these countries cannot be harnessed. In many cases, project offsets similar to the Clean Development Mechanism of the Kyoto Protocol can realize low-cost emission abatement and the credits can be used to lower compliance costs in an ETS. For larger-scale changes in developing country development pathways, policy reform is necessary. For such reforms, a carbon price may not be the most useful signal, and other methods of policy-focused engagement are more promising.[17]

Implications for a U.S. federal system

There are both political and efficiency reasons to design a system with an eye to potential linkage to other systems. Some decisions made in the design of a domestic US system can help or hinder the potential for such linkages. A simple compliance system based on financial penalties and the use of absolute emission targets are examples of features that make linking easier. Successful linkage will depend in large part on mutual confidence in the monitoring, verification and legal capacities underpinning each system. This will tend to make links to other industrialized systems more promising. It is doubtful whether such systems in major developing countries such as China and India are a realistic near-term prospect.

[1] Compliance strategies included switching to cleaner fuels, modifying production processes, replacing boilers, modifying combustion, installing control technologies, and retiring or deferring units. U.S. Environmental Protection Agency (EPA). 2004. Industrial Source Participation in the OTC NOx Budget Program. Washington, DC: U.S. EPA Office of Air and Radiation.

[2] Aulisi, A., Farrell, A.F., Pershing, J., and VanDeveer, S. 2005. Greenhouse Gas Emissions Trading in U.S. States: Observations and lessons from the OTC NOx Budget Program. Washington, DC: World Resources Institute.

[3] 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

[4] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission trading within the Community and amending Council Directive 96/61/EC.

[5] See http://www.defra.gov.uk/environment/climatechange/trading/uk/pdf/trading-rules_rev2.pdf for the rules of the UK ETS. These rules were given statutory force in the Waste and Emissions Trading Act 2003.

[6] Haites, E., Mullins, F., 2001. Linking Domestic and Industry Greenhouse Gas Emission Trading Systems, EPRI, International Energy Agency (IEA) and International Emissions Trading Association, Paris

[7] To be precise, using outside credits such as EU allowances is only permitted if the market price for carbon averages more than $7 per allowance over a 24 month period.

[8] In 2005 WRI undertook a substantial analysis of policy-based approaches to cutting emissions in developing countries. See Bradley, Rob & K.A. Baumert. 2005. *Growing in the Greenhouse: Protecting the climate by putting development first*. Washington, DC: World Resources Institute, *available at*: http://climate.wri.org/growingingreenhouse-pub-4087.html

9.*See* Yong-Gun Kim & Kevin A. Baumert, *Reducing Uncertainty Through Dual-Intensity Targets*, *in* BUILDING ON THE KYOTO PROTOCOL: OPTIONS FOR PROTECTING THE CLIMATE 109, 129 (Kevin A. Baumert et al. eds., 2002) ("Negotiating emission controls is challenging precisely because of pervasive uncertainties: Countries do not actually know what they are agreeing to.").

10 Data in this section are from Navigating the Numbers, a comprehensive effort undertaken by WRI to evaluate a wide range of indicators, as well as their implications for target-setting. *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.

11.With respect to the environmental outcomes, guessing wrongly on a target level would have considerable implications. If the target is set too loosely it will have no environmental benefit. Such a target might even weaken the environmental outcome of the treaty in the event that excess emission allowances are transferred to other countries through Kyoto's international emissions trading provisions. In other words, the environment might be better off if the country had never taken a target to begin with. On the other hand, if the target is set too stringently (i.e., too few emissions are allowed), it may constrain economic development or, alternatively, lead to treaty non-compliance or target renegotiations. Given their aversion to risk, developing country governments are likely to avoid emission targets that have the potential to adversely affect economic growth, even if that potential is remote. *See generally* Kim & Baumert, *supra* note 9.

12.Baumert et al., *supra* note 10.

13.Willems S. & Baumert K., 2003, *Institutional Capacity and Climate Actions*, OECD/IEA, Paris, at 25–26.

14.U.N. Framework Convention on Climate Change, Subsidiary Body for Implementation, 17th Sess., New Delhi, India, Oct. 23–29, 2002, *Fourth Compilation and Synthesis of Initial National Communications from Parties Not Included in Annex I to the Convention*, 28, U.N. Doc. FCCC/SBI/2002/16 (Oct. 1, 2002) (noting that almost all Parties reported difficulties stemming from the lack of quality data, lack of technical and institutional capacity, and problems related to methodologies), *available at* http://unfccc.int/resource/docs/2002/sbi/16.pdf.

[15] These positions were restated most recently in the addresses of China and India to the G8 Summit at Gleaneagles in July 2005.

[16] In 2002 the average American emitted 6.9 times more CO_2 than the average Chinese, and 18 times more than the average Indian. Climate and other relevant data are freely available online through WRI's Climate Analysis Indicators Tool: http://cait.wri.org

[17] See for instance Bradley & Baumert, *supra* note 8.