EXECUTIVE SUMMARY

Concerns that human actions may be adding greenhouse gases to the atmosphere of the earth, thereby inducing artificial warming of the earth's climate, have stimulated a search for ways to mitigate these potential effects. The most important of the greenhouse gases is carbon dioxide (CO_2). There are three basic methods of reducing the total amounts of carbon dioxide added by human actions to the atmosphere. One way is to reduce levels of overall energy consumption, resulting in reduced burning of fossil fuels and associated releases of carbon. Second, forms of energy production that are less carbon-intensive, such as natural gas, might be substituted for forms that are more intensive, such as coal. Third, carbon can be prevented from entering or can be removed from the earth's atmosphere by a "carbon sequestration" or "carbon sink" strategy.

Trees and other plants absorb carbon in the process of growth. In addition to actions that might increase the total amount of carbon sequestered in plant life, it is also possible to remove carbon from power plant and other emission streams by chemical and mechanical means and then to sequester this carbon in the oceans or other storage places. Though there are numerous, significant uncertainties with respect to long-term sink capacity, some estimates have been made. Table 1 shows recent estimates of total potential for carbon sequestration associated with the major sink options within the boundaries of the United States.

Table 1. U.S. Annual Carbon Sequestration Potential, by Method

Method Of Sequestration	Sequestration Potential (MMTC per yr)	Percent of U.S. Kyoto Reduction Target
Agricultural Soils	88 – 232	15 - 40%
Biomass	136 – 218	24 - 38%
Carbon "Scrubbing" of Power Plant Emissions	347 – 417	60 - 72%
Forests	40 – 60	7 - 10%

To put the carbon reduction potentials in Table 1 in some context, the total net U.S. additions to the atmosphere equal about 1,550 million metric tons of carbon (MMTC) per year. The United States could comply with the greenhouse gas reduction targets set for it in the Kyoto Protocol by reducing carbon emissions by 577 MMTC per year from baseline levels currently projected for 2010. Hence, carbon sequestration in the United States alone could more than meet the Kyoto targets for the United States, if the Senate were to ratify the Treaty (which is not expected).

In most discussions of climate change policy issues, and in the actions of the Clinton Administration to date, policies to promote carbon sequestration or to enhance carbon sinks have received less attention than energy reduction and substitution. However, actions to increase the levels of total carbon sequestration may be a preferable option. Increasing world sink capacity may be less costly than other climate change mitigation strategies. It may offer a cost-effective response to climate change concerns, with fewer disruptions to existing patterns of energy consumption and production. As such, it may be politically more acceptable than other carbon reduction possibilities. Table 2 shows the estimated ranges of costs for the leading methods of carbon sequestration.

Table 2. Estimated Costs of Additional Carbon Sequestration, by Method

Method of Sequestration	**Cost (Per Ton)**
Agricultural Soils	$0 - ?
Biomass	$20 - $320
Carbon “Scrubbing” from Power Plant Emissions	$60 - $300
Forestry	$1 - $25

Some methods of carbon sequestration may have zero or minimal costs, once informational and other institutional barriers to innovation have been overcome. Others have costs less than $25 per ton of carbon, a common benchmark for cost-effective methods of energy conservation or substitution to reduce atmospheric carbon levels. Other methods of carbon sequestration have estimated present costs in the range of $50 to $100 per ton. Some economists have calculated that a carbon tax in excess of $100 per ton would be required to achieve shifts in energy production and consumption sufficient to comply with potential U.S. obligations under the Kyoto Protocol. Carbon sequestration may reduce atmospheric carbon levels at lower cost than other alternatives.

There are four basic methods for carbon capture and sequestration: agricultural, biomass energy, mechanical “scrubbing” removal of CO_2, and forestry.

Agricultural—Typically not mentioned in climate negotiations, changes in agricultural practices—including soil erosion management, land restoration and reclamation, conservation tillage, residue management, and crop rotation—offer the potential to sequester almost 50 percent of the annual U.S. mitigation target set in the Kyoto Protocol. Furthermore, altering farming techniques to increase sequestration can be achieved at minimal cost, often yielding increased profits. Altering farming practices, in addition, produces several environmental benefits, such as more productive soil, decreased soil erosion, and reduced non-point pollution from pesticides and nutrients.

Despite the many advantages of changing agricultural practices, several obstacles exist for their full implementation. First, farmers are often comfortable with current farming practices and changing techniques involves going against 100 years of research, learning, and “trial and error.” Also, shifting to different practices can add costs in the form of mistakes and precautionary methods. Second, one technique, conservation tillage, involves a substantial initial cost of a newly designed planter. Third, many of the techniques involve leaving crop residue on the land, which some farmers claim is not pleasing aesthetically. Lastly, federal legislation in the past has provided incentives for farmers to use the land in ways that decreased the sequestering ability of the soil.

Carbon sequestration can have other important advantages. The leading methods of increasing total carbon sequestered in agricultural soils would also reduce nitrogen, phosphorus and other runoff that is now contributing to water pollution in many parts of the United States. Increasing the total forested area in the United States, and worldwide, can provide wildlife habitat for many species and enhanced recreational opportunities. Avoiding deforestation in tropical areas– and thus acting to increase the total sink capacity of world forests – can be an effective way of enhancing worldwide plant and animal biodiversity.

Biomass Energy—Biomass energy offers another opportunity for agriculture to contribute to carbon sequestration. The potential exists because the combined effect of the original sequestration and the subsequent release of carbon would approximate to a zero net release of carbon into the atmosphere. The United States currently has the ability to produce 10,000 MW of generating capacity, and the potential may exceed 50,000 MW in 20-30 years. This would avert the release of 90 MMTC annually from the burning of conventional fossil fuels, which represents 16% of the cumulative reductions required under the Kyoto Protocol over the next ten years.

To be proven as a viable energy source, biomass must become economically feasible. Current costs of biomass range between $1.95 to $3.50 per million Btu, compared with $1.25 to $2.25 for natural gas and $0.90 to $1.35 for coal. Unless biomass technology improves, thereby reducing costs, government subsidies will be required to encourage the use of biomass as an energy source. However, despite these cost limitations, biomass provides further benefits beyond its use as a sequestration tool and energy source. Growing energy crops also puts idle lands and idle farmers back into production and creates jobs in rural communities. Furthermore, since biomass energy uses residues, it also helps alleviate the growing problem of waste disposal. In spite of these possible side benefits, biomass can result in several environmental problems such as decreased biodiversity and large land investments.

Another biomass sequestration tool would be to increase the biomass potential of the ocean through iron fertilization. Iron is thought to be the limiting factor in algal growth. The application of 500 kg of iron to the equatorial Pacific resulted in a thirty-fold increase in phytoplankton biomass. While research into iron fertilization is fairly new, several private organizations are studying this technique to increase fish harvest. In marine biomass and biomass energy, further research is needed to improve the economic viability and soften their possible impact on the environment.

Mechanical CO_2 Removal—Several existing technologies can separate CO_2 from the flue gas emitted during power plant operation. Current capture techniques include chemical absorption, adsorption, cryogenic processes, and membranes. These techniques could potentially capture 347 to 417 MMTC annually, which amounts to approximately 60-70% of annual emissions reductions to meet Kyoto. Currently, the major limiting factor to full implementation of capture technology is the potential cost, with estimates ranging between $60 and $250 per ton of carbon avoided.

Once the carbon is captured, there are several methods to sequester the emissions. The technology currently exists to inject CO_2 deep into the ocean, to depths of 1000-1500m. This technique has the largest storage potential, between 380,000 to 5,400,000,000 MMTC. The other use of this captured CO_2 is through terrestrial disposal, either by direct disposal or utilization. The options include: injecting it into aquifers and exhausted oil and gas wells; using it for enhanced oil recovery and coalbed methane production; replacing CO_2 currently produced for the chemical industry with captured flue gas CO_2; and artificially increasing the growth of aquatic plants to increase the transfer of CO_2 across the water surface (direct biofixation). The cost of these storage techniques range between $15 to $29 per ton of carbon avoided.

Outside of costs, technical uncertainty represents the biggest limitation of CO_2 storage. Substantial research needs to be employed to better understand the environmental impacts on the ocean ecosystem and the extent of time that the carbon remains stored when injected into the oceans and terrestrial areas. The United States is far behind other nations in funding research on technological sinks, having spent less than $100 million on CO_2 capture and storage since 1989, compared with $350 million spent by Japan since 1990. To advance this sequestration technique, this paper suggests a budget averaging $60 million per year for six years.

Forestry—By increasing total forest area, improving forest management, and by increasing urban forest cover, the United States could potentially sequester 64 MMTCE per year. Including the reductions in emissions from energy efficiency, due to reduced air conditioning and heating demands from forest cover, the total potential of forestry rises to 97 MMTCE annually (about 17% of Kyoto commitments). Such reductions can be achieved at relatively low costs, between $1 and $25 per ton, depending on the extent of sequestration sought and the forestry technique employed.

Several forestry methods can be employed to sequester carbon from the atmosphere. First, increasing total forest cover through reforestation and afforestation of marginal cropland and pastureland could potentially sequester 39 MMTCE per year (about seven percent of Kyoto requirements), at a cost of $9-$25 per ton. Second, expanding sink potential of existing forests through more intensive replanting and improved management practices could sequester between 9 and 23 MMTCE per year (two to four percent of Kyoto commitments), for $9-$30 per ton. Lastly, urban forestry—through replanting initiatives, better management, and improved shade—could sequester between 12 and 34 MMTCE per year, (about four percent of Kyoto commitments), at a cost of $0.20-$2.00 per ton.

Aside from carbon sequestration, forestry initiatives can also provide a number of environmental benefits, including improved water and air quality, increased wildlife habitat, and additional recreation opportunities in urban settings. Despite these advantages, forest projects have several limitations, such as land availability (which can largely impact the cost), susceptibility of monocultures to disease and pests, and loss of biodiversity due to single species planting.

The potential of the United States for complying with Kyoto obligations through carbon sequestration increases when worldwide carbon trading possibilities are taken into account. Carbon sequestration can often be accomplished at lower costs in other nations than in the United States. Three issues will largely impact international sink potential: offsets and credits; baselines, leakage, and other issues in carbon trading; and private brokering.

Offsets and Credits—Though agriculture, biomass energy, and technological sinks can be employed in other nations, forests are the focus of most discussion concerning international sink projects. Worldwide, there are about 800 million hectares of unforested land capable of sustaining forest cover that are currently unutilized for agriculture. An area this size could sequester 2800 MMTCE per year. This figure does not include deforestation prevention, which could result in large greenhouse gas reductions at an extremely low cost—typically less than $4 per ton.

To achieve sequestration in other nations, the United States would likely employ such mechanisms as Joint Implementation (JI), the Clean Development Mechanism (CDM), and international carbon trading. Current work is being done on JI through the U.S. Initiative on Joint Implementation (USIJI). As of March 1998, this program had accepted 32 projects (12 of which involved sequestration) that, if fully funded and implemented, will result in net emissions reductions of about 200 million metric tons of CO_2. CDM will play an integral role in sequestration projects, since most sink programs are established in developing countries. Most JI and CDM projects will be utilized to gain credit for an international carbon trading program. The structure of CDM, JI, and carbon trading programs will affect the quantity of sequestration programs outside the United States

Baselines, Leakage, and Other Issues in Carbon Trading – A successful carbon trading regime must accurately measure the offsets and credits to assure companies that they will received the reductions that they paid for. Currently, baselines are set on a case-by-case basis, and the potential for flaws is large because of the scientific uncertainty. Also, what the land use would have been prior to the sequestration project determines whether the project has resulted in an additional reduction in greenhouse gases. Difficulties in conceptualizing baselines include the boundaries of the project, the inclusion of forest soils and other vegetation in the sequestration calculation, deforestation baseline, and how much natural regeneration would occur without the project.

Leakage may occur as a result of afforestation and reforestation projects in side regions. There are three types of leakage that may occur. First, citizens may shift their activities to other areas that were not previously utilized. Second, project activities could result in a shortage of resources and therefore a higher price for the commodity. Lastly, a project that increases the energy intensity of a traditional non-energy intensive activity will see leakage occur due to construction effects. Current sequestration projects can provide insight into methods of dealing with leakage. Some projects provide guaranteed income as an incentive to farmers willing to shift from one type of land use to forestry production. Other projects have taken a more traditional approach of purchasing and protecting threatened forests through restricted, managed sustainable use.

Reporting and monitoring systems will also be important factors in determining the success of sequestration. While our understanding of the science of sequestration has improved in the last few years, undertaking a substantially accurate evaluation of carbon sequestration remains a complex task, with changes in sequestration not necessarily observable. Monitoring, on the other hand, is a matter of cost-effectiveness. If cost were not an issue, an elaborate monitoring regime could be developed that would help ensure the accuracy of the measurements. The success of reporting and monitoring systems hinges on the transparency of the project, the technical soundness, and the cost-effectiveness.

Private Brokering—One role for the government may be to aid in the conceptual development of the accounting system and then to oversee a private system which would make the actual calculations. Private firms are already filling this role without the formal consent of the government. These firms act as brokers between potential buyers and sellers and as marketers to other investors, either individuals or countries. In general, these brokerage firms identify projects that need funding and determine for each project how much carbon will be sequestered and at what cost.

Brokers address baseline, leakage, and verification and monitoring issues with different degrees of seriousness. To address the issue of leakage, these firms often incorporate demand-based mitigation activities, employment generation, equipment retirement schemes, and other methods. For monitoring and verification, these firms employ a wide variety of models, which can produce vastly different results using the same numbers. Therefore, establishing a consistent system will add credibility to the offsets and help to ensure a trading regime that will be acceptable to all parties.

Any sequestration program will have to evolve out of political discussions between domestic and international participants. How non-governmental organizations, federal governments, and local citizens perceive sequestration will largely determine the impact of sinks in future greenhouse policy. This role is being played out in domestic politics, the Clinton Administration, and proposals for early action credit.

Domestic Politics – The position of three domestic groups will sharply influence the role of sequestration in climate change policies. First, the environmental community has mixed support for sinks. Groups like the Nature Conservancy, American Forests, the Environmental Defense Fund, and World Resources Institute argue that sinks are a credible policy tool that can accomplish emissions reductions while also providing side-benefits such as improved water quality and the reversal of deforestation. Other environmental groups, including Ozone Action and Worldwatch Institute, believe that sinks are a way for U.S. industry and government to sidestep their respective responsibilities to reduce fossil fuel consumption. Yet another set of environmental groups, such as National Environmental Trust and Center for International Environmental Law, are withholding an official position until the details of sink policy are fully developed.

Second, business groups seem to support the use of sinks, but are firmly grounded in the need for climate change mitigation to do as little damage as possible to their bottom line. Groups such as American Petroleum Institute, Edison Electric Institute, the National Mining Association, and the American Forest and Paper Association support sink policy because they view it as a means to achieve emissions reductions without reducing domestic fossil fuel consumption. However, business groups, including the Business Council for Sustainable Energy, the American Farm Bureau Federation, and Global Climate Coalition, are either completely opposed to sinks or not actively pushing sequestration policy.

The third group of important political players in sink policy is members of Congress. There has been some support of sinks from such members as Senator Ron Wyden (D-OR), Senator Chafee (R-RI), and Senator Pat Roberts (R-KS). Senator Wyden is supportive of credit for early action and is interested in bringing a state level reforestation program to the national level. Senator Chafee has been one of the strongest and earliest supporters of carbon sequestration because he is interested in the co-benefits that sinks bring to the environment. Senator Roberts is quite optimistic that a large portion of the U.S. sink capacity is based in agriculture and is therefore interested in carbon sequestration without a government mandate.

The Clinton Administration—While the Administration is actively researching the role of sinks, the specific allocation towards sinks is not clearly evident in climate change budgets. The federal budget for climate change has risen from $4.12 billion in 1997 to $5.25 billion in 1999. Funding for climate change is allocated between a host of programs including U.S. Global Change Research Program, Climate Change Technology Initiative, and several international programs.

Federal agencies are also conducting research into the potential of sequestration as a climate mitigation tool. Currently, there are eight main agencies/departments that are devoting a portion of their funding to researching carbon sinks. The agencies are the Department of Energy, Environmental Protection Agency, Department of Agriculture, National Aeronautics and Space Administration, National Science Foundation, National Oceanic and Atmospheric Administration, Department of Interior, and the Smithsonian Institute.

Since the Geneva Convention in July 1996, the United States has taken a position on sinks in all of the major climate change negotiations and reports. The majority of focus concerning sinks has been in areas of forestry, such as reforestation and afforestation. Recently, the United States has been interested in the implications of other activities (Article 3.4) and wants soil carbon management, improvements in forest management, and conservation to be considered as acceptable sink programs. The outcome of this position will likely be evident in the upcoming IPCC Special 2000 Report.

Early Action Credit – One of the most important policy actions taken by the U.S. government to promote carbon sequestration is the development of an "early action" program. In 1994, the Department of Energy (DOE) established a Voluntary Reporting of Greenhouse Gases Program. Between 1994 and 1997, the number of sequestration projects filed grew nearly 400 percent. Of the sequestration projects, nearly 96% of the projects have involved forestry. Approximately one percent of the projects (two in total) has involved conservation tillage, and four percent are a mix of other sink projects. Clearly, early action programs have revolved around efforts to increase forest cover.

The DOE recognizes that estimating the sequestration effects of forestry activities is "especially challenging;" however, they allow entities to report in either of two estimation methods: standard or reporter-generated. The standard method allows the project coordinators to base their estimations on a table of tree species' ability to sequester carbon given other specific criteria. If the project does not fit the categories provided, the DOE suggests that the party develop their own analysis for a reporter-generated project. Because of these different estimation methods, making comparisons between projects is difficult. If DOE early action projects are to be incorporated into a future credit for early action program, it must identify further standard methods for comparing procedures.

Currently, DOE allows reporters to choose the baseline of their individual project. Entities are not required to report on specific reductions, which results in partial reporting of true emission impacts. Furthermore, DOE allows entities to report both domestic and international projects. Including international projects in a credit for early action program would be controversial. In light of the above considerations, DOE should establish a technical advisory committee to review and adjust the program to a level of standardization necessary for accommodating a credit initiative.

Recommendations

The future of sink policy is uncertain. The IPCC does not release its recommendations on sinks until May 2000, and currently many different groups are racing to establish the "facts" on sinks. However, even in light of this uncertainty, a climate change policy that incorporates sinks seems to be here to stay. After an in-depth analysis looking at the possible role of sinks as a carbon sequestration device, we have formed the following five overall conclusions**:**

1. The use of methods of increased carbon sequestration should become an integral part of a part of a balanced, diverse portfolio of U.S. climate change strategies.

Our findings indicated that there are many different sequestration methods that show a promising ability to increase their carbon sequestration capabilities. For example, there is more carbon stored in the soil than in the atmosphere, forests, and all vegetation combined. Thus agricultural sinks, enhanced by conservation tillage practices, could be an important strategy to mitigate global climate change. With only 37% of U.S. crops planted with conservation tillage in 1998, there is great potential for additional increases in carbon sequestration to 88-232 MMTC per year (Lal, 1998). With appropriate government policies, this potential might be realized at little to no cost to taxpayers and with considerable environmental co-benefits.

Other significant possibilities exist with biomass and forestry initiatives. Biomass, a renewable energy source, has great potential to increase carbon sequestration and to offset fossil fuel burning. Forestry initiatives, such as increasing forested acreage and improving management of forested lands, could substantially increase carbon storage in the United States and provide offsets for our carbon emission levels. In total, the carbon stored in U.S. vegetation and soils could be increased by as much as 64 MMTCE per year.

Finally, technological sinks represent a mitigation strategy that has the potential to sequester large amounts of carbon. With more research and experimentation, scrubbing technologies could be applied to all power plants in the U.S. and capture approximately 347 to 417 MMTC (20-30% of total U.S. CO_2 emissions per year).

An important point to remember is that these various sequestration opportunities would have many positive environmental and economic co-benefits. They may help reduce soil erosion, improve water quality and wildlife habitat, and increase recreational opportunities. Sinks can also help improve the quality of life, reduce heating and cooling costs, and create jobs.

2) ***The level of financial resources committed to study of sink alternatives should be increased substantially.***

In 1998, $4.6 billion of federal money was directly related or associated with global climate change. Millions of that was spent on sink-related research, but much more is needed to make sinks a viable, quantifiable, and completely legitimate mitigation strategy. Only $1 to $2 million per year is being spent on technologies for "scrubbing" carbon dioxide from power plant emissions, even though these technologies have much promise. In the United States, although much of climate change funding is not allocated for sink research specifically, many federal agencies are working on sink-related issues. Given the U.S. position, on both the international and domestic fronts, sinks should continue to play a major role in U.S. climate change policy and should receive more directed appropriations.

The government can play an important role in promoting carbon sequestration by changing its subsidy system and enforcing laws to promote practices that would capture carbon and benefit the environment. The federal government should also use incentives to encourage private citizens to develop their own small-scale carbon sinks. Private corporations could be encouraged to participate in sink research and development through regulatory and financial incentives. Leading research in many fields is often accomplished faster and for lower costs in the private sector. Collaborative pilot projects with various industries (utilities, oil and gas companies, etc.) should be encouraged. Finally, private sector involvement could also assure the longevity of sink research and help relieve pressures on the federal budget. In many areas, cost is the biggest obstacle to overcome before widespread sink options are available. If more funding is allocated and further research is carried out, the goal of U.S. leadership in sinks should be attainable.

3)The United States should commit significantly greater resources to research and development of the various technologies of carbon sequestration, including support for demonstration projects where appropriate.

Federal research and development with sinks is ongoing, but deserves increased funding to be considered a viable option for controlling greenhouse gas emissions and for future sustainable energy generation as well. Since one set of options will not solve the climate change problem, it seems logical to research all potential mitigation strategies so that a range of options will be available in the future. In all areas of sink research there is a clear need for more direction and more appropriations.

For example, broad extensive research is needed in all areas of biomass energy, including algae farms, ocean carbon cycles, and iron fertilization. In terms of technological sinks, the greatest limitation to capture implementation is its high cost. With further research focused on chemical absorption and membranes, these costs will likely decrease. Unfortunately, U.S. research efforts have been deficient. At its current pace, Japan will become the world leader in CO_2 capture and sequestration. An increased research budget should allow the United States to compete for leadership in this area.

4) The United States should develop an accurate and reliable method of accounting for changes in world sink capacity, including estimation of baselines and accounting for leakage due to substitution effects.

A carbon accounting system is one of the most controversial and difficult aspects of the carbon sequestration issue. There is a great deal of variability in estimates for carbon sequestration potential, mainly due to uncertainties in calculations. For example, within forestry, only a limited amount of scientific study has been conducted on the relationship between forest growth and carbon impacts. Initial estimates have a high margin of error due to the complexity of estimating sequestration emissions impacts, in determining valid methodologies, and in maintaining up-to-date reporting requirements for sequestration projects. Securing the proper expertise to deal with this complexity should be a priority.

One way of establishing accurate and reliable methods of carbon accounting is the use of third-party verification and auditing. In a global carbon trading regime, billions of dollars may someday be at stake. A vague, lax system of reporting and verification will draw criticism from many sectors, possibly disabling the entire scheme. Brokering companies and programs that consider the problems of leakage, verification, and baseline determination, and account for them in their project eligibility, will add an essential level of legitimacy to sinks as a viable climate change option.

Another possible way for the U.S. to establish an accurate and reliable method of accounting would be for the federal government to establish a technical advisory committee of experts for sequestration, potentially desegregating this committee into forest versus other expertise. The unbiased committee would then be responsible for reviewing all reported sequestration projects, performing a review of available studies on estimation methods, instituting a third-party verification stipulation, and reviewing and adjusting the program at regular intervals. This type of review/standardization should legitimize the programs and be able to accommodate a credit initiative for early action legislation. The hope is that a sound verification and monitoring system will increase the incentive for entities to report. The net effect, therefore, may actually be an increase in participation and could push voluntary action toward the level necessary to meet future binding requirements.

5) The United States should continue to support the incorporation of sinks into the Kyoto Protocol or any subsequent international climate change treaty, including allowing for a prominent role for sinks as part of any future international carbon trading regime.

The United States insisted that carbon sinks and other mechanisms such as JI, CDC, and emissions trading be included in the Kyoto Protocol. Since the United States will likely be one of the main investors, it should take the lead in improving and clearly defining the criteria for sink projects. Surprisingly, the United States has not taken a leadership role in devising carbon accounting systems and other elements of an institutional framework for implementing projects under these mechanisms. It would benefit the U.S. government to review the AIJ projects and formulate a methodology that would help keep baselines consistent, remove ambiguity in assumptions and mitigate uncertainties in carbon sequestration projects.

Carbon sinks will be an important element of future climate change negotiations. If the United States is to make a strong case for including sinks in any climate change legislation, it will have to increase research, spending, and development of policy options. Finally, the U.S. has become an authority on sink-related issues and should continue to lobby for all proven sink activities to be included in international reduction obligations. The United States must not lose sight of its interests or the interests of the other Parties. It should push for a timely increase of worldwide sink activities.