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EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D. C. 20503

November 5, 1999

GENERAL COUNSEL

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MEMORANDUM FOR DESIGNATED AGENCY HEADS
(SEE ATTACHED DISTRIBUTION LIST)

FROM: Robert G. Damus *RD*
General Counsel

SUBJECT: Proposed Executive Order Entitled "Greening the Government Through
Leadership in Environmental Management"

Attached is a proposed Executive order entitled "Greening the Government Through
Leadership in Environmental Management" that was prepared by White House Council on
Environmental Quality.

On behalf of the Director of the Office of Management and Budget, I would appreciate
receiving any comments you may have concerning this proposal. If you have any comments
or objections, they should be received no later than close of business Wednesday, November
17, 1999. Please be advised that agencies that do not respond by the deadline will be recorded
as not objecting to the proposal.

Comments or inquiries may be submitted by telephone to Mr. Mac Reed (202-395-
3563) or Carla Stone (202-395-9177) of this office or faxed to (202-395-7294).

Thank you.

Attachments - Distribution List
Proposed Executive order

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Executive Order

**GREENING THE GOVERNMENT THROUGH LEADERSHIP
IN ENVIRONMENTAL MANAGEMENT**

By the authority vested in me as President by the Constitution and the laws of the United States of America, including the Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. 11001-11050) (EPCRA), the Pollution Prevention Act of 1990 (42 U.S.C. 13101-13109) (PPA), the Clean Air Act (42 U.S.C. 7401-7671q) (CAA), and section 301 of title 3, United States Code, it is hereby ordered as follows:

PART 1 - PREAMBLE

Section 101. Federal Environmental Leadership. The head of each federal agency is responsible for ensuring that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision-making and long-term planning processes, across all agency missions, activities and functions. Consequently, environmental management considerations must be a fundamental and integral component of federal government policies, operations, planning and management. The head of each federal agency is responsible for meeting the goals and requirements of this order.

PART 2 - GOALS

Sec. 201. Environmental Management. Through development and implementation of environmental management systems, each agency shall ensure that strategies are established to support environmental leadership programs, policies and procedures and that agency senior level management explicitly and actively endorse these strategies.

Sec. 202. Environmental Compliance. Each agency shall comply with environmental regulations by establishing and implementing environmental compliance audit programs and policies which emphasize pollution prevention as a means to both achieve and maintain environmental compliance.

Sec. 203. Right-to-Know and Pollution Prevention. Through timely planning and reporting under EPCRA, federal facilities shall be responsible members of their community by informing the public and their workers of possible sources of pollution resulting from facility operations. Each agency shall strive to reduce or eliminate harm to human health and the environment from releases of pollutants to the environment. Each agency shall advance the

national policy that, whenever feasible and cost-effective, pollution should be prevented or reduced at the source. Funding for compliance programs shall emphasize pollution prevention as a means to address environmental compliance.

Sec. 204. Release Reduction: Toxic Chemicals and Criteria Pollutants. Through innovative pollution prevention, facility management and acquisition and procurement practices, each agency shall reduce its reported Toxic Release Inventory (TRI) releases and off site transfers of toxic chemicals by ten percent annually or 40 percent by December 31, 2006. Consistent with Executive Order 13123, each agency shall reduce the release of criteria air pollutants attributed to facility energy use by 30 percent by December 31, 2010.

Sec. 205. Use Reduction: Toxic Chemicals and Hazardous Substances and Other Pollutants. Through identification of proven substitutes and established facility management practices including advanced procurement practices and pollution prevention, each agency shall reduce its use of selected toxic chemicals, hazardous substances and pollutants or its generation of hazardous and radioactive waste streams by 50 percent by December 31, 2006.

Sec. 206. Reductions in Ozone-Depleting Substances. Through evaluating present and future uses of ozone-depleting substances and maximizing the use of safe alternatives each agency shall develop a plan to phase out the procurement and use of all non-excepted Class I ozone-depleting substances by December 31, 2010.

Sec. 207. Environmentally and Economically Beneficial Landscaping. Each agency shall strive to promote the sustainable management of federal facility lands through the implementation of cost effective, environmentally sound landscaping practices and programs to reduce adverse impacts to the natural environment. Each agency shall eliminate the use of Organophosphate and Carbamate pesticides in landscaping activities no later December 31, 2000.

PART 3 - PLANNING AND ACCOUNTABILITY

Sec. 301. Annual Budget Submission. Each agency's annual budget submission to the Office of Management and Budget (OMB) shall specifically request funding necessary to achieve the goals of this order. OMB shall issue guidelines to assist agencies in developing appropriate requests that support sound investments in environmental management and pollution

prevention. Each agency's budget request to OMB in support of this order shall be within its planning guidance level.

Sec. 302. Application of Life Cycle Assessment. Each agency and its facilities shall apply life cycle assessment and environmental cost accounting principles to meet the goals and requirements of this order. Such analysis shall be considered in the process established in the OMB Capital Programming Guide and OMB, Circular A-11. The Environmental Protection Agency (EPA) in coordination with OMB and the workgroup established in section 306 of this order, shall provide technical assistance to agencies in developing life cycle assessment and environmental cost accounting assessments under this Part.

Sec. 303. Pollution Prevention Return-on-Investment Programs. Each agency shall develop and implement a pollution prevention program that compares the life cycle operating costs of treatment and/or disposal of waste and pollutant streams to the initial investment costs of eliminating or reducing such wastes at the source. Each agency shall request investment funding and implement those source reduction projects that payback the original investment within three years, or otherwise offer substantial environmental or economic benefits.

Sec. 304. Pollution Prevention to Address Compliance. Each agency shall ensure that its environmental regulatory compliance funding policies promote the use of pollution prevention to achieve and maintain environmental compliance at the agency's facilities. Agencies shall adopt a policy to preferentially use pollution prevention projects and activities to correct and prevent non-compliance with environmental regulatory requirements. Agency funding requests for facility compliance with federal, state and local environmental regulatory requirements shall emphasize pollution prevention through source reduction as the means of first choice to ensure compliance, with reuse and recycling alternatives having second priority as a means of compliance.

Sec. 305. Policies, Strategies and Plans.

(a) Within 12 months of the date of this order, the head of each agency shall ensure that the goals and requirements of the Greening the Government Executive Orders are incorporated into existing agency environmental directives, policies and documents affected by the requirements and goals of this order. Where such directives and policies do not already exist,

the head of each agency shall, within 12 months of the date of this order, prepare and endorse a written agency environmental management strategy to achieve the requirements and goals of the Greening Government Executive Orders. Agencies are encouraged to include elements of relevant agency policies or strategies developed under this part in agency planning documents prepared under the Government Performance and Results Act of 1993, Public Law 103-62.

(b) By March 31, 2002, each agency shall ensure that each of its facilities develops a written plan which sets forth the facility's contribution to the goals established in this order. The plan should reflect the size and complexity of the facility. Where pollution prevention plans have been prepared for agency facilities, an agency may elect to update those plans to meet the requirements and goals of this section.

(c) To facilitate compliance with this order, the Federal Acquisition Regulation (FAR) Council shall develop acquisition policies and procedures for contractors and/or concessioners to supply agencies with all information necessary for compliance with this order. Once the appropriate FAR clauses have been published, agencies shall use them in all applicable contracts. In addition, to the extent that compliance with this order is made more difficult due to lack of information from existing contractors, including contracts with concessioners, each agency shall take practical steps to obtain the information needed to comply with this order from such contractors or concessioners.

Sec. 306. Interagency Environmental Leadership Workgroup. Within four months of the date of this order, EPA shall convene an Interagency Environmental Leadership Workgroup with senior-level representatives from all executive agencies and other interested independent government agencies affected by this order. The Workgroup members will assist EPA in developing policies and guidance required by this order and facilitate implementation of the requirements of this order in their respective agencies. Workgroup members shall coordinate with their Agency Environmental Executives (AEE) designated under section 301(d) of Executive Order 13101 and may request the assistance of their AEE in resolving issues that may arise among members in developing policies and guidance related to this order. If the AEE's are unable to resolve the issues, they may request the assistance of Chair of the Council on Environmental Quality.

Sec. 307. Annual Reports. Each agency shall submit an annual progress report to the Administrator on implementation of this order. The first report is due on October 1, 2001 to cover calendar year 2000 activities, and subsequent reports are due on October 1, of each year covering activities in the previous calendar year. These reports shall include a description of the progress that the agency has made in complying with all aspects of this order, including the use of pollution prevention to achieve environmental requirements. A copy of the report shall be submitted to the Federal Environmental Executive (FEE) by EPA for use in the biennial Greening the Government Report to the President prepared in accordance with Executive Order 13101. Within nine months of the date of this order, EPA, in coordination with the workgroup established under section 306 of this order, shall prepare guidance regarding the information for the annual report.

PART 4 - PROMOTING ENVIRONMENTAL MANAGEMENT and LEADERSHIP

Sec. 401. Agency and Facility Environmental Management Systems.

(a) Within 18 months of the date of this order, each agency shall conduct an agency-level environmental management system self assessment based on the Code of Environmental Management Principles for Federal Agencies developed by EPA (61 Federal Register 4062) and/or other appropriate existing environmental management system standards. Each assessment shall include a review of agency environmental leadership goals, objectives and targets. Where appropriate, the assessments may be conducted at the service, bureau or other comparable level.

(b) Within 24 months of the date of this order, each agency shall implement environmental management systems through pilot projects at selected agency facilities based on the Code of Environmental Management Principles for Federal Agencies and/or other appropriate existing environmental management system standards. By December 31, 2005, each agency shall implement environmental management systems at all appropriate agency facilities based on facility size, complexity and the environmental aspects of facility operations. The facility environmental management system shall include measurable environmental goals, objectives and targets which are reviewed and updated annually. Once established, environmental management system standards shall be incorporated in agency facility audit protocols.

Sec. 402. Facility Compliance Audits.

(a) Within 12 months of the date of this order, each agency that does not have an established regulatory environmental compliance audit program shall develop and implement a program to conduct facility environmental compliance audits and begin auditing at its facilities within 6 months of the development of that program.

(b) Agencies with an established regulatory environmental compliance audit program, may elect to conduct environmental management system audits in lieu of regulatory environmental compliance audits at selected facilities.

(c) Facility audits shall be conducted periodically, but generally not less than every three years from the date of the initial or previous audit. The scope and frequency of audits shall be based on facility size, complexity and the environmental aspects of facility operations. As appropriate, each agency shall include contractor and concessioner activities in facility audits.

(d) Each agency shall conduct internal reviews and audits, and take such other steps, as may be necessary to monitor its facilities' compliance with sections 501 and 504 of this order.

(e) Each agency shall consider findings from the assessments or audits conducted under this Part in program planning under section 301 and in the preparation and revisions to facility plans prepared under section 305 of this order.

(f) EPA shall provide technical assistance in meeting the requirements of this Part by conducting environmental management reviews at federal facilities and developing policies and guidance for conducting audits and implementing environmental systems at federal facilities.

Sec. 403. Environmental Leadership and Agency Awards Programs.

(a) Within 12 months of the date of this order, the Administrator shall establish a "Federal Government Environmental Leadership Program" to promote and recognize outstanding environmental management performance in agencies and facilities.

(b) Each agency shall develop an internal agency-wide awards program to reward innovative programs and individuals showing outstanding environmental leadership in implementing this order. In addition, based upon criteria developed by EPA in coordination with the workgroup established in section 306 of this order, federal employees who demonstrate outstanding leadership in implementation of this order may be considered for recognition under

the White House awards program set forth in section 803 of Executive Order 13101.

Sec. 404. Management Leadership and Performance Evaluations.

(a) To ensure awareness of and support for environmental requirements of this order, each agency shall include training on the provisions of the Greening the Government Executive Orders in standard senior level management training as well as training for program managers, contracting personnel, procurement and acquisition personnel, facility managers, and other personnel as appropriate.

(b) To recognize and reinforce the responsibilities of facility and senior Headquarters program managers, regional environmental coordinators and officers, their superiors and to the extent practicable and appropriate, others vital to the implementation of this order, each agency shall include successful implementation of pollution prevention, community awareness and environmental management into its position descriptions and performance evaluations for those positions.

Sec. 405. Compliance Assistance.

(a) Upon request and to the extent practicable, EPA shall provide technical advice and assistance to agencies to foster full compliance with environmental regulations and all aspects of this order.

(b) Within 12 months of the date of this order, EPA shall develop a compliance assistance center to provide technical assistance for federal facility compliance with environmental regulations and all aspects of this order.

(c) To enhance landscaping options and awareness, the United States Department of Agriculture (USDA) shall conduct research on the suitability, propagation, and the use of native plants for landscaping. Information generated as a result of this research shall be disseminated and made available to all agencies and the general public by USDA in conjunction with the center under subsection (b). In implementing Part 6 of this order, agencies are encouraged to develop model demonstration programs in coordination with USDA.

Sec. 406. Compliance Assurance.

(a) EPA, in consultation with other agencies, may conduct such reviews and inspections as may be necessary to monitor compliance with sections 501 and 504 of this order. Agencies

are encouraged to cooperate fully with the efforts of EPA to ensure compliance with those sections.

(b) Whenever the Administrator notifies an agency that it is not in compliance with section 501 or 504 of this order, the agency shall provide EPA a detailed plan for achieving compliance as promptly as practicable.

(c) The Administrator shall report annually to the President and public on agency compliance with the provisions of sections 501 and 504 of this order.

Sec. 407. Improving Environmental Management. To ensure that Government-wide goals for pollution prevention are advanced, each agency is encouraged to incorporate its environmental leadership goals into its Strategic and Annual Performance Plans required by the Government Performance and Results Act of 1993, Public Law 103-62, starting with performance plans accompanying the FY 2002 budget.

PART 5 - EMERGENCY PLANNING, COMMUNITY RIGHT-TO-KNOW AND POLLUTION PREVENTION

Sec. 501. Toxics Release Inventory/Pollution Prevention Act Reporting.

(a) Each agency shall comply with the provisions set forth in section 313 of EPCRA, section 6607 of PPA, all implementing regulations, and future amendments to these authorities, in light of applicable EPA guidance.

(b) Each agency shall comply with these provisions without regard to the Standard Industrial Classification (SIC) or North American Industrial Classification System (NAICS) delineations. Except as described in subsection (d) of this section, all other existing statutory or regulatory limitations or exemptions on the application of EPCRA section 313 to specific activities at specific agency facilities apply to the reporting requirements set forth in subsection (a) of this section.

(c) Each agency required to report under subsection (a) shall do so using electronic reporting as provided in EPCRA section 313 guidance.

(d) Within 12 months of the date of this order, the Administrator shall review the impact on reporting of existing regulatory exemptions on the application of EPCRA section 313 at federal facilities. Where feasible, this review shall include pilot studies at federal facilities. If the review

indicates that application of existing exemptions to federal government reporting under this section precludes public reporting of the release or offsite transfer of substantial amounts of toxic chemicals, EPA shall prepare guidance, in consultation with the workgroup established under section 306 of this order, amending application of the exemptions at federal facilities. The guidance shall ensure those releases are reported consistent with the goal of public access to information on releases and transfers of toxic chemicals to the environment. The guidance shall be submitted to the Agency Environmental Executives established under section 301(d) of Executive Order 13101 for review and endorsement. Each agency shall apply any guidance to reporting at its facilities as soon as practicable but no later than reporting for the next calendar year following release of the guidance.

(e) EPA shall coordinate with other interested federal agencies to carry out pilot projects to collect and disseminate information about the release and other waste management of chemicals associated with the environmental response and restoration at their facilities and sites. The pilot projects will focus on transfers and releases associated with environmental response and restoration at facilities and sites where the activities generating wastes do not otherwise meet EPCRA section 313 thresholds for manufacture, process or otherwise use. Each agency is encouraged to identify applicable facilities and voluntarily report under subsection (a) of this section the releases and other waste management of toxic chemicals managed during environmental response and restoration, regardless of whether the facility otherwise would report under subsection (a). The releases and other waste management associated with environmental response and restoration voluntarily reported under this subsection will not be included in the accounting established under sections 503(a) and (c) of this order.

Sec. 502. Release Reduction: Toxic Chemicals and Criteria Pollutants.

(a) Beginning with reporting for calendar year 2001 activities, each agency reporting under section 501 of this order shall adopt a goal of reducing the agency's total releases of toxic chemicals to the environment and off-site transfers of such toxic chemicals for treatment and disposal by at least ten percent annually or 40 percent by December 31, 2006. Beginning with activities for calendar year 2001, the baseline for measuring progress in meeting the reduction goal will be the aggregate of all releases and off-site transfers of toxic chemicals for treatment and disposal as reported by all of the agency's facilities under section 501. The list of toxic chemicals applicable

to this goal is the EPCRA section 313 list as of December 1, 2000. If an agency achieves the 40 percent reduction goal prior to December 31, 2006, that agency shall establish a new baseline and reduction goal based on agency priorities.

(b) Where an agency is unable to pursue the reduction goal established in subsection (a) for certain chemicals that are mission critical and needed to protect human health and the environment, that agency may request a waiver from EPA of the requirement in subsection (a). Waiver requests must provide an explanation of the mission critical use of the chemical and a description of efforts to identify a less harmful substitute chemical or alternative processes to reduce the release and/or transfer of the chemical in question. EPA may grant such a waiver for no greater than two years. An agency may resubmit a request for waiver at the end of that period. The waiver under this section shall not alter requirements to report under section 501 of this order.

(c) Within 12 months of the date of this order, each agency shall develop and support goals to reduce the release of criteria air pollutants attributed to its facilities energy use by 30 percent by December 31, 2010, consistent with Executive Order 13123.

Sec. 503. Use Reduction: Toxic Chemicals, Hazardous Substances, and Other Pollutants.

(a) Within 18 months of the date of this order, each agency shall develop and support goals to reduce the agency's total use of the priority chemicals on the list under subsection (b) or alternative chemicals and pollutants the agency identifies under subsection (c) by at least 50 percent by December 31, 2006.

(b) Within nine months of the date of this order the Administrator, in coordination with the workgroup established in section 306 of this order, shall develop a list of not less than 15 priority chemicals used by the federal government that may result in significant harm to human health or the environment and that have known, readily available, less harmful substitutes. These chemicals will be selected from listed EPCRA section 313 toxic chemicals and, where appropriate, other regulated hazardous substances or pollutants. In developing the list, the Administrator shall consider: (1) environmental factors including toxicity, persistence and bio-accumulation; (2) availability of known, less environmentally harmful substitute chemicals which can be used in place of the priority chemical; (3) availability of known, less environmentally harmful processes which can be used in place of the priority chemical; and (4) relative costs of alternative chemicals or processes.

(c) If an agency uses less than five of the priority chemicals on the list developed in subsection (b), the agency shall develop, within 12 months of the date of this order, a list of not less than five chemicals which may include priority chemicals under section (b) or other toxic chemicals, hazardous substances and/or other pollutants the agency uses or generates, the release, transfer or waste management of which may result in significant harm to human health or the environment.

(d) If an agency is unable to reduce its use of the priority chemicals on the list in subsection (b) or develop a list of alternative chemicals and other pollutants under subsection (c), the agency shall develop, within 12 months of the date of this order, a list of not less than five priority hazardous or radioactive waste streams generated by its facilities. Within 18 months of the date of this order, the agency shall develop and support goals to reduce the agency's generation of these wastes by at least 50 percent by December 31, 2006. To the maximum extent possible, such reductions shall be achieved by implementing source reduction practices.

(e) The baseline for measuring reductions for purposes of achieving the 50 percent reduction goal in subsections (a) and (d) for each agency is the first calendar year following the development of the list of priority chemicals under subsection (b).

(f) Each agency shall undertake pilot projects at selected facilities to gather and make publically available materials accounting data related to the toxic chemicals, hazardous substances and/or other pollutants identified under subsections (b),(c), or (d).

(g) Within 12 months of the date of this order, the Administrator shall develop guidance on implementing this section in consultation with the workgroup established under section 306 of this order. EPA shall develop technical assistance materials to assist agencies in meeting the 50 percent reduction goal of this section.

Sec. 504. Emergency Planning and Reporting Responsibilities. Each agency shall comply with the provisions set forth in sections 301 through 312 of EPCRA, all implementing regulations, and future amendments to these authorities, in light of any applicable guidance as provided by EPA.

Sec. 505. Reductions in Ozone-Depleting Substances.

(a) Each agency shall ensure that its facilities: (1) maximize the use of safe alternatives to ozone-depleting substances, as approved by EPA's Significant New Alternatives Policy (SNAP) program; (2) consistent with subsection (b), evaluate the present and future uses of ozone-depleting

substances, including making assessments of existing and future needs for such materials, and evaluate use of, and plans for recycling, refrigerants and halons; and (3) exercise leadership, develop exemplary practices and disseminate information on successful efforts in phasing out ozone-depleting substances.

(b) Within 12 months of the date of this order, each agency shall develop a plan to phase out the procurement and use of all non-excepted Class I ozone-depleting substances by December 31, 2010. Plans should target cost effective reduction of environmental risk by phasing out Class I ozone depleting substance applications as the equipment using those substances reaches its expected service life. Exceptions to this requirement are all aircraft, space vehicles, specialized uses in law enforcement, and military applications, including weapon systems and related war-time support equipment and facilities.

(c) Agencies shall amend their personal property management policies and procedures to preclude disposal of ozone depleting substances removed or reclaimed from their facilities or equipment, including disposal as part of a contract, trades, and donations, without prior coordination with the Department of Defense (DoD). Where the recovered ozone-depleting substance is a critical requirement for DoD missions the agency shall transfer the materials to DoD. DoD will bear the costs of such transfer.

PART 6 - LANDSCAPING MANAGEMENT PRACTICES

Sec. 601. Implementation.

(a) Within 12 months from the date of this order, each agency shall incorporate the Environmentally and Economically Beneficial Practices guidance (60 Federal Register 40837) developed by the Federal Environmental Executive (FEE) into landscaping programs, policies and practices.

(b) Each agency shall eliminate the use of Organophosphate and Carbamate pesticides in landscaping activities at their facilities to be replaced by reduced risk alternatives, as soon as practicable, but no later December 31, 2000.

(c) Within 12 months of the date of this order, the FEE shall form a workgroup of appropriate federal agency representatives to review and update that guidance as appropriate.

(d) Each agency providing funding for non-Federal projects shall furnish funding recipients

with information on environmentally and economically beneficial landscaping practices and work with the recipients to support and encourage application of such practices on federally funded projects.

Sec. 602. Technical Assistance and Outreach. EPA, the General Services Administration (GSA), and USDA shall provide technical assistance on environmentally and economically beneficial landscaping practices to agencies and their facilities.

PART 7 - ACQUISITION AND PROCUREMENT

Sec. 701. Limiting Procurement of Toxic Chemicals, Hazardous Substances, and Other Pollutants.

(a) Within 12 months of the date of this order, each agency shall implement training programs to ensure that agency procurement officials and acquisition program managers are aware of the requirements of this order and its applicability to those individuals.

(b) Within 24 months of the date of this order, each agency shall determine the feasibility of implementing centralized procurement and distribution (e.g. "pharmacy") programs at its facilities for tracking, distribution and management of toxic or hazardous materials and, where appropriate, implement such programs.

(c) Under established schedules for review of standardized documents, DoD and GSA, and other agencies, as appropriate, shall review their standardized documents and identify opportunities to eliminate or reduce their use of chemicals included on the list of priority chemicals developed by EPA under section 503(b) of this order, and make revisions as appropriate.

(d) Agencies shall follow the policies and procedures for toxic chemical release reporting in accordance with the FAR section 23.9 effective as of the date of this order and policies and procedures on federal compliance with right to know laws and pollution prevention requirements in accordance with FAR section 23.10 effective as of the date of this order.

Sec. 702. Environmentally Benign Adhesives. Within 12 months after environmentally benign pressure sensitive adhesives for paper products become commercially available, each agency shall revise its specifications for paper products using adhesives and direct the purchase of paper products using those adhesives, whenever technically and economically practicable. Agencies should consider products using the environmentally benign pressure sensitive adhesives approved

by the U.S. Postal Service (USPS) and listed on the USPS Qualified Products List for pressure sensitive recyclable adhesives.

Sec. 703. Ozone-Depleting Substances. Each agency shall follow the policies and procedures for the acquisition of items which contain, use, or are manufactured with ozone-depleting substances in accordance with FAR section 23.8 effective as of the date of this order.

Sec. 704. Environmentally and Economically Beneficial Landscaping Practices.

(a) Within 18 months of the date of this order, each agency shall have in place acquisition and procurement practices, including provision of landscaping services that conform to the guidance referred to in section 602 of this order, for the use of environmentally and economically beneficial landscaping practices at their facilities. At minimum, such practices shall be consistent with the policies in section 601 of this order.

(b) In implementing landscaping policies, each agency shall purchase environmentally preferable and recycled content products, including EPA-designated items such as compost and mulch, that contribute to environmentally and economically beneficial practices.

PART 8 - EXEMPTIONS.

Sec. 801. National Security Exemptions. In the interest of national security, the head of any agency may request from the President an exemption from complying with the provisions of any or all provisions of this order for particular agency facilities, provided that the procedures set forth in section 120(j)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 U.S.C. 9620(j)(1)), are followed, with the following exceptions: (a) an exemption issued under this section will be for a specified period of time that may exceed one year; (b) notice of any exemption granted under this section, including a succinct statement of the reasons for the exemption, will be published in the Federal Register; (c) notice of any exemption will not be provided to the Congress; and (d) an exemption under this section may be issued due to lack of appropriations, provided that the head of the agency requesting the exemption shows that necessary funds were requested by the agency in its budget submission and agency plan under Executive Order 12088 and were not contained in the President's budget request or Congress failed to make available the requested appropriation. To the maximum extent practicable, and without compromising national security, each agency shall strive to comply with the purposes, goals, and implementation

steps in this order. Nothing in this order affects limitations on the dissemination of classified information pursuant to law, regulation, or Executive Order.

PART 9 - GENERAL PROVISIONS.

Sec. 901. Revocation. Executive Order 12843 of April 21, 1993, Executive Order 12856 of August 3, 1993, the Executive Memorandum on Environmentally Beneficial Landscaping of April 26, 1994, and Executive Order 12969 of August 8, 1995 are revoked.

Sec. 902. Limitations.

(a) This order is intended only to improve the internal management of the executive branch and is not intended to create any right, benefit or trust responsibility, substantive or procedural, enforceable at law by a party against the United States, its agencies, its officers, or any other person.

(b) This order applies to federal facilities in any State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, the Northern Mariana Islands, and any other territory or possession over which the United States has jurisdiction. Agencies with facilities outside of these areas, however, are encouraged to make best efforts to comply with the goals of this order for those facilities.

(c) Nothing in this order alters the obligations under EPCRA, PPA, and CAA independent of this order for government-owned, contractor-operated facilities and Government corporations owning or operating facilities or subjects such facilities to EPCRA, PPA, or CAA if they are otherwise excluded. However, each agency shall include the releases and transfers from all such facilities to meet the agency's responsibilities under part 5 of this order.

(d) Nothing in this order shall be construed to make the provisions of CAA sections 304 and EPCRA sections 325 and 326 applicable to any agency or facility, except to the extent that an agency or facility would independently be subject to such provisions.

Sec. 903. Community Outreach. Each agency is encouraged to establish a process for local community advice and outreach for its facilities relevant to aspects of this and other related Greening the Government Executive Orders. All strategies and plans developed under this order shall be made available to the public upon request.

PART 10 - DEFINITIONS

For purposes of this order:

Sec. 1001. General. Terms which are not defined in this part but which are defined in Executive Orders 13101 and 13123 have the meaning given in those Executive Orders. For the purposes of Part 5 of this order all definitions in EPCRA and PPA and implementing regulations at 40 CFR Parts 370, 371, and 372 apply.

Sec. 1002. "Administrator" means the Administrator of the EPA.

Sec. 1003. "Environmental cost accounting" means the modification of cost attribution systems and financial analysis practices specifically, (a) to directly trace environmental costs that are traditionally hidden in overhead accounts to the responsible products, processes, facilities or activities and, (b) to consider environmental costs that are typically overlooked or excluded (e.g., costs of materials lost in waste streams, environmental management costs and costs associated with long-term potential liabilities).

Sec. 1004. "Facility" means any buildings, installations, structures, land, public works, equipment, and other property owned or operated by, or constructed or manufactured and leased to, the Federal government. This term includes a group of facilities at a single location, managed as an integrated operation as well as Government Owned Contractor Operated facilities.

Sec. 1005. "Environmentally benign pressure sensitive adhesives" means adhesives for stamps, labels, and other paper products that can be easily treated and removed during the paper recycling process.

Sec. 1006. "Ozone-depleting substance" means any substance designated as a Class I or Class II substance by EPA in 40 CFR Part 82.

Sec. 1007. "Pollution prevention" means "source reduction," as defined in the PPA, and other practices that reduce or eliminate the creation of pollutants through: (a) increased efficiency in the use of raw materials, energy, water, or other resources; or (b) protection of natural resources by conservation.

Sec. 1008. "Greening Government Executive Orders" means this order and the series of orders on greening the government including, Executive Order 13101, Executive Order 13123 and other future orders as appropriate.

Sec. 1009. "Environmental aspects" means the elements of an organization's activities, products or services that can interact with the environment.

THE WHITE HOUSE,



EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20502

THE CHAIRMAN

January 12, 1999

Dear Chairman Schaefer:

Enclosed please find answers to some of the questions submitted as a follow-up to the hearing held by the Subcommittee on Energy and Power on October 6, 1998 regarding the Kyoto Protocol and the outlook for the negotiations in Buenos Aires.

As you know, the follow-up questions were submitted to both the Department of State and the Council of Economic Advisers (CEA). For obvious reasons, the State Department is drafting answers to those questions that pertain to the climate change negotiations and diplomatic matters. The answers provided by the CEA today are in response to those questions relating to economic issues and the Administration's economic analysis.

Please feel free to contact me if you have any further questions or need additional information.

Sincerely,

A handwritten signature in cursive script that reads "Janet L. Yellen".

Janet L. Yellen

The Honorable Dan Schaefer
Chairman, Subcommittee on Energy & Power
House Commerce Committee
2125 Rayburn House Office Building
Washington, D.C. 20515-6117

— Enclosure

9. **The Administration's forecast of "modest" costs of the Kyoto Protocol on the U.S. economy is predicated on the assumptions of developing country participation and full use of flexible implementation mechanisms. What would be the total costs to the U.S. economy if those two assumptions are not correct -- that is, if the major developing countries do not participate, and if the use of flexible implementation mechanisms is capped at no more than 50% of our 7% reduction target?**

The Administration's conclusion that the costs of the Kyoto Protocol will be modest if we are successful in implementing an effective international emissions trading system and we achieve meaningful participation by key developing countries reflects an understanding of the existing economic literature and the various cost-saving flexibility mechanisms of the Protocol. The Administration provided a set of illustrative modeling results to describe what it means by the term "modest". However, as noted in the July 1998 report "The Kyoto Protocol and the President's Policies to Address Climate Change: Administration Economic Analysis" (AEA), these modeling results are illustrative and do not include several important cost-mitigating factors, including the opportunities to sequester carbon dioxide, the Administration's electricity restructuring bill, and R&D investments and tax incentives included in the President's budget referred to as the Climate Change Technology Initiative. Any "forecast" of the costs should reflect these cost-mitigating factors. Further, as noted in the October testimony, it is important to consider the results from other economic models, and the preliminary results from the Stanford Energy Modeling Forum were presented.

Regarding the issue of developing country participation, the Administration has previously made available results from our illustrative modeling analysis. On pages 297-298, 302-303, 322-325, 333, 337-339, and 351 of the "Kyoto Protocol and its Economic Implications", the published record of the March 4, 1998 hearing before this Subcommittee, are estimates of permit prices and resource costs to the U.S. economy of various forms of developing country participation. Again, any assessment of the cost of the Kyoto Protocol assuming that developing countries do not adopt emissions targets and participate in international emissions trading is sensitive to assumptions about the nature of Annex I trading, sinks, developing country participation in the Clean Development Mechanism (CDM), as well as domestic policy efforts, such as electricity restructuring and the Climate Change Technology Initiative.

An assessment of the effects of trading caps on U.S. costs is also very difficult, especially given the uncertainty regarding the interpretation of sinks. The interpretation of the term

“cap” is at best unclear. However, it should be noted that a cap on the use of flexibility mechanisms set at 50% of the emissions target (i.e., the assigned amount) would not restrict the United States. For example, in the illustrative modeling analysis, the Administration assumed that the emissions target under the Protocol, as an annual average, would be 1,515 MMTCE. Setting a cap so the United States could only purchase half of this 1,515 MMTCE, on an annual average, would not be restrictive, because the United States, in the model, would need to reduce less than this on an annual average from its business as usual emissions level to comply with its Kyoto target. Other forms of arbitrary restrictions on trading could be more binding on the United States.

10. What U.S. industries and sectors of our economy would be hardest hit by the Kyoto Protocol?

Although there may be increases in output in some sectors and decreases in others, we do not anticipate any significant aggregate economic effect if we achieve meaningful participation by key developing countries and effective international trading. The effects on energy prices described in my testimony and in the AEA will occur more than a decade in the future. Not only are these effects small relative to historical variations in energy prices, and offset by other policies like electricity restructuring, they would occur sufficiently far in the future to enable monetary policy to keep the economy operating at its potential. In energy-intensive sectors some reduction in output could occur, although given the very small predicted change in energy prices, impacts in most such sectors are apt to be minimal. In addition, the coal industry may also experience a decrease in output. However, in the illustrative modeling analysis, the Administration found that by 2010 coal consumption would be greater under permit prices ranging from \$14 to \$23/ton than in 1995.

11. Will the combination of tax credits, research and development, and emissions trading be sufficient to meet all of the U.S. target of a 7% reduction, or will additional measures be necessary? If additional measures are likely to be needed, what specifically is the Administration proposing?

The Administration has proposed a suite of efforts to abate greenhouse gas emissions. These include the tax incentives and R&D funding through the 5 year, \$6.3 billion Climate Change Technology Initiative, the Administration's electricity restructuring bill, industry consultations resulting in voluntary industry goals to reduce emissions, the actions by the Federal government to reduce its energy use, and appropriate credit for early actions to reduce emissions by the private sector. In addition, the Administration has proposed a domestic trading program for the first commitment period (2008-2012), and supports international flexibility mechanisms where private firms operating in the domestic market can participate in the international emissions trading market, the Clean

Development Mechanism, and joint implementation. Finally, the Administration supports the comprehensive inclusion of sink activities, and will provide appropriate incentives for increasing carbon sequestration domestically. The Administration believes that all of these efforts, if adequately implemented, will be sufficient to meet the U.S. target. However, the Administration is not ruling out taking other appropriate steps to address the risks of climate change.

14. Has the Administration offered its economic analysis for peer review.

No.

15. One of the assumptions upon which the Administration's economic analysis is based is "meaningful participation by key developing countries". Could you please explain what that meant for purposes of the economic analysis? For example what was the nature of the commitment that was assumed for countries like China, India, etc..... How are cost estimates impacted if countries like Argentina or South Korea take on commitments but countries like China and India do not?

For purposes of the illustrative modeling analysis, the Administration used the four developing country modules in the Second Generation Model. The version of SGM we used happens to have specific modules for China, India, Korea, and Mexico. We assumed that the last non-Annex I region module, defined as the "rest of the world", did not have a binding target. For the illustrative modeling exercise, we assumed that these four countries had emissions targets set at their 2010 business as usual (BAU) levels, but all reduced emissions well below this to participate in trading (in some cases, as much as 20% below BAU).

Cost estimates would be affected based on the extent and nature of participation by developing countries. However, even if some countries like China and India do not adopt emissions targets, they could still reduce emissions by participating in the Clean Development Mechanism. Furthermore, trading among industrialized countries alone could bring costs down into a relatively modest range. An effective international market for trading emissions permits among industrialized countries -- even without taking into account the added benefit of including key developing countries -- would potentially lower the resource cost to the United States by more than half relative to a scenario in which all abatement is performed domestically, and would lower the price for emission permits (expressed as carbon equivalent) by nearly three-fourths. With the Clean Development Mechanism and Annex I trading, resource costs would be about two-thirds lower and permit prices four-fifths lower than a domestic only scenario.

16. **Dr. Yellen: Most of your testimony was about the costs of reducing greenhouse gas emissions. But you also mentioned that the same measures reduce pollution, thus bringing economic benefits. How can one compare the costs against the benefits of reduced pollution and reduced global warming?**

Efforts to abate greenhouse gas emissions now can slow the rate of growth in the atmospheric concentration of greenhouse gases thereby reducing the risks of climate change. In addition, abating carbon dioxide emissions from fossil fuel combustion can result in reducing the emissions of local air pollutants. These are two significant categories of benefits. Regarding the former category, however, there are substantial uncertainties that make estimating the economic benefits very difficult. Please refer to pages 40 and 41 of the AEA for a discussion of these difficulties. Regarding the latter category of benefits, the Administration found that the benefits from improving public health by reducing emissions of particulate matter and ozone precursors could be approximately one-quarter the costs of greenhouse gas emissions abatement. Please refer to pages 66 through 69 of the AEA for a discussion of this analysis.

17. **Dr. Yellen: Do you account in your economic analysis for the number of lives saved due to reduced pollution? If not, why not?**

The AEA provides a discussion of the ancillary public health benefits associated with abating greenhouse gas emissions (pages 66-69). Implicit in the economic benefits estimates provided in this section is an assessment of the statistical life-years saved by reducing pollution. This assessment employed the methodologies used by the Environmental Protection Agency in its Regulatory Impact Analysis of the particulate matter and ozone national ambient air quality standards promulgated in 1997. In effect, the analysis does account for the number of lives saved due to reduced air pollution.

18. **Dr. Yellen: In your testimony you project that the cost per household of implementing the Kyoto Accord will be “nearly fully offset” by price declines from electricity restructuring. You also comment that the electricity restructuring is likely to cause a significant reduction of greenhouse gas emissions. Why is that -- where would the reduced emissions come from? How are we going to get lower electricity prices, greater efficiencies, and technological innovations all at the same time?**

The Administration’s Comprehensive Electricity Competition Plan (CECP) is estimated to reduce greenhouse gas emissions by about 25 to 40 million metric tons of carbon equivalent per year by 2010. Although competition will lower prices, which will tend to increase consumption, it will also provide a direct profit incentive for generators to produce more electricity with less fuel and improve energy efficiency as competitive

sellers seek to maximize the value of their product offerings to buyers by bundling electricity with energy efficiency and management services. Specific CECP provisions that will yield additional emission reductions include a renewable portfolio standard, a public benefits fund that will support renewable energy and energy efficiency investments, “green” labeling to provide consumers who value clean energy information on how to buy it, and a net metering provision encouraging the installation of small renewable systems.

19. **Dr. Yellen: The breakup of AT&T was followed by rapid technological innovation and adoption in the telecommunications industry. If the breakup of electricity monopolies also spurs rapid changes in electricity generation, transmission, and distribution technologies, how would that affect the cost predictions of current economic models?**

If electricity restructuring resulted in accelerated rates of technological innovation and diffusion than what has been projected by current economic models, and if these new technologies improve energy efficiency and the carbon efficiency of electricity generation and transmission, then the cost predictions by these models are likely to over-estimate the costs of abatement.

20. **Dr. Yellen: The second panel presented economic analyses that project higher costs to reduce emissions than ones you presented. Why do their results differ from the Administration’s forecasts?**

In our review of the economic literature, we have found that the nature of the question a model attempts to address can significantly affect the results. In the Administration’s analysis, we assumed widespread use of important flexibility mechanisms and developing country participation. Modeling efforts that assume no international emissions trading, no participation by developing countries through the CDM and/or trading, and abatement only of carbon dioxide emissions from fossil fuel combustion do not reflect the Administration’s policies or many of the key components of the Kyoto Protocol. The modeling results from the Stanford Energy Modeling Forum (EMF) exercise described in my testimony confirm that the assumption about the scope of trading alone can affect permit price estimates by nearly a factor of ten. The EMF exercise found that the reduction in permit prices as trading expands from no trading to Annex I trading to full global trading is robust. On average, the EMF models found that Annex I trading would cut the U.S. permit price by 53% relative to a no-trading scenario. Of these models, one estimated a 72% reduction in the permit price under Annex I trading. In full global trading, the permit price would be, on average, 80% lower than the no trading price. Several models estimated permit price reductions of about 90%.

21. **Many countries wanted the Protocol to address only the three major greenhouse gases, carbon dioxide, methane, and nitrous oxide. The Administration advocated, and won, inclusion of all 6 categories of greenhouse gases. What are the economic benefits of including 6 kinds of gases, instead of 3?**

By including all 6 kinds of greenhouse gases, the Kyoto Protocol provides two kinds of benefits relative to the 3-gas basket proposals. First, by pursuing a comprehensive approach to all greenhouse gases, the 6-gas basket can increase the environmental benefit by mitigating the emissions of the so-called synthetic gases, emissions which are growing faster than the other three greenhouse gases. Second, expanding the coverage of gases increases the flexibility in abatement opportunities. There are low-cost opportunities for emissions abatement and technological substitution relative to the other gases, whose emissions result from established and long-term infrastructure.

22. **You discuss in your testimony the cost-savings possible with effective international trading. Since the rules for international trading have not been agreed to, could you describe what you mean by an effective international emissions market?**

An effective international emissions market would likely have several desired properties, including active participation by the private sector, low transaction costs, competitive behavior by buyers and sellers, low rates of cheating, sufficient liquidity, and no imposed caps or taxes. Such a market would ideally work like any other well-functioning market for a good or financial instrument.

23. **You state in your testimony that the Kyoto Protocol will not affect aggregate employment. However, we have heard from other economists that this agreement could cost the U.S. millions of jobs. Why is the range of estimates so large?**

The estimates of employment effects vary substantially because of the nature of the models used and the kind of questions being addressed by the models. Regarding this first point, some models are better suited to project short-term economic activity while others are better suited to evaluate long-term economic activity. These short-term models were designed to project the state of the U.S. economy over the next several quarters and up to a year or two into the future. However, if model scenarios are conducted over a 10 to 20 year time horizon, these short-term models usually find higher unemployment resulting from implementing the Kyoto Protocol. Long-term models, such as the Second Generation Model, are conditioned on the assumption that aggregate employment effects are negligible. Given the long lead time before any impact would occur, this assumption is more appropriate.

Second, different models used to address different questions generate different results. In the short-term models, the estimates of employment effects tend to be driven by estimates of permit prices and costs to the economy. Since some of these analyses assume no international emissions trading, the costs to the economy and the subsequent employment effects are projected to be significant. However, these scenarios do not reflect the Administration's policies or the many cost-saving attributes of the Kyoto Protocol. A smarter approach to reducing global emissions, through effective international emissions trading, would significantly reduce the economic costs to the economy and result in no significant aggregate employment effects.

24. **The Kyoto Protocol does not require countries to meet binding targets until 2008. However, there are certain aspects of the Protocol, such as the Clean Development Mechanism, that allow for emissions reductions to occur as early as the year 2000. Further, the Administration is pushing for tax incentives and research and development now. Dr. Yellen, why is it so important to do these things now?**

The Administration advocated in Kyoto for the 2008 to 2012 time frame for the first commitment period -- a more realistic time frame than what had been proposed by many other countries. The importance of setting binding targets a decade out is not to postpone efforts, but so emissions reductions can occur along a gradual and credible path in the early years. By adopting a gradual and credible path of emissions reductions, in the early years, adjustment costs can be reduced while attaining the same ultimate environmental goals. For example, analysis conducted by the Energy Information Administration for the Interagency Analytical Team effort in 1997 found that reducing emissions in 2005 to meet a target in 2010 can have 65% greater economic costs than starting emissions reductions in 2000 to meet the same 2010 target.

To start along this gradual path, the Administration has proposed tax incentives and R&D funding for technologies that can reduce greenhouse gas emissions. In addition, the Administration supports the banking of emission reduction credits beginning in 2000 from CDM projects. On both the domestic and international scenes, these efforts provide the incentive to develop and deploy new technologies to reduce emissions and to begin the transition that is necessary to achieve the emissions targets for the first commitment period. If we delay our efforts to abate emissions until 2008, then we increase the risk of either having much higher costs of complying with the Kyoto targets or of not complying with the targets.



EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20502

December 14, 1998

THE CHAIRMAN

Dear Chairman Sensenbrenner:

This letter responds to your October 20, 1998 letter regarding economic analysis of the Kyoto Protocol. Your letter requested comments on two issues. First, I will address your interest in the Council of Economic Advisers' (CEA) views on the Energy Information Administration (EIA) report "Impact of the Kyoto Protocol on U.S. Energy Markets and Economic Activity." Second, I will respond to your question regarding implementing legislation.

CEA Views on EIA Report

In evaluating the results from any economic modeling effort, it is important to first identify and understand what questions are being addressed by using that particular model. The most significant cause for divergence in modeling results is that different modelers ask and answer different questions.

In the Administration's assessment of the economic implications of the Kyoto Protocol, a set of questions that reflect the Administration's position on the Protocol are addressed. For instance, the Administration unambiguously supports the efficient implementation of the "flexibility mechanisms" secured in the Kyoto Protocol -- international emissions trading, joint implementation, and the Clean Development Mechanism -- and we will continue to work over the coming years in bilateral and multilateral fora to develop rules that ensure such implementation. In the Administration's illustrative modeling analysis, these flexibility mechanisms are critical to reducing the costs of meeting emissions targets, not just for the United States, but also for the European Union, Japan, and all other Annex I countries.

Economic modeling efforts outside of the U.S. government have also found that these flexibility mechanisms can significantly reduce the cost to the United States of reaching its Kyoto target. For example, the Energy Modeling Forum (EMF) based at Stanford University, which has a long-running model comparison exercise involving many of the leading climate and energy models, has coordinated full scale analyses of the Kyoto Protocol. This comparison exercise of the Kyoto Protocol included ten modeling teams from the United States, Europe, and Asia. The Kyoto Protocol enables all countries with emissions targets to trade emissions allowances among other countries with targets. In evaluating the Kyoto Protocol, all of the participating teams used economic models that incorporate the potential for international trading in greenhouse gas permits. These models are well-suited to assess the economic implications of the international trading component of the agreement. On average, the EMF models found that Annex I trading would cut the U.S. permit price by 53% relative to a no trading scenario. Of these models, one estimated a 72% reduction in the permit price under Annex I trading. In full global trading, the permit price would be, on average, 80% lower than the no trading price. Several models estimated permit price reductions of about 90%.

In addition, the Organization for Economic Cooperation and Development (OECD) recently convened modelers from around the world for a climate change modeling workshop. While many of the modeling teams at OECD also participate in the EMF exercise, the workshop included four non-EMF teams. The results from non-EMF models reinforce the importance of international emissions trading in lowering permit prices. These models also found that Annex I trading can significantly reduce costs, and global trading can result in even more substantial cost-savings.

The modeling results from these two large efforts coordinated by EMF and by the OECD clearly indicate the potential for cost-savings through an efficiently-designed international trading system. It is important to recognize that these two efforts relied exclusively on models with the capacity to model explicitly international trade in emissions allowances. We believe that it is appropriate to evaluate the Kyoto Protocol with models that can assess the opportunities for international emissions trading, since trading is embedded in Article 17 of the Protocol. Models that cannot evaluate international trading are constrained in the kinds of questions they can effectively address.

The Energy Information Administration's model is not capable of addressing the question of international emissions trading: it is focused only on the U.S. energy sector and has no international emissions trading component. Thus, EIA did not conduct any analysis of cost-effective international trading opportunities. A traditional economic analysis of international trading would assess the demand and supply of emissions allowances and, by modeling a market where costs are minimized, identify a single international permit price. This is the approach taken by the Administration as well as by the EMF and OECD modeling teams. However, the EIA analysis assesses only the demand side of the issue for the United States, and then incorporates what appear to be arbitrary assumptions about alternative possibilities for the international permit price and subsequent international transfers. The scenarios that attempt to include international trading overstate the cost of permits because they fail to take into account the way that an international market, equilibrating to a single international permit price, lowers cost.

Even if one were to ignore international trading completely, the EIA analysis generates higher U.S. permit prices than nine of the ten models participating in the EMF exercise. This implies that EIA may be making more pessimistic assumptions about the responsiveness of the economy to reducing emissions than the broad climate change modeling community.

In addition to the question of international trading, there are other important questions that models should consider in evaluating the Kyoto Protocol. For example, the Protocol covers all six major kinds of greenhouse gases. While most of the models involved in the EMF and the OECD exercises did not consider these other gases in their analyses, the Administration's illustrative modeling effort did address this issue. The EIA analysis does not address this question. The model used by EIA cannot assess the opportunities for abating non-carbon dioxide greenhouse gas emissions. EIA makes an assumption that moving from 1990 -7% to 1990 -3% reflects the opportunities for emissions abatement in non-carbon dioxide gases and carbon sinks based on a misinterpretation of a State Department paper describing how the 1990 -7% target agreed to in Kyoto is roughly equivalent to 1990 -3% under the accounting system used in the

President's October 1997 proposed target of returning to 1990. Under EIA's interpretation, sinks and other greenhouse gases would provide only 57 MMTCE annually, irrespective of the price of greenhouse gas permits. This implies that the United States would achieve its target almost exclusively through carbon dioxide reductions and international trading. However, it is reasonable to expect that as permit prices increase, as they do across the various scenarios in the EIA report, higher levels of abatement of these other greenhouse gases would become cost-effective and would occur.

The flexibility across gases allows countries and companies to make reductions in the most cost-effective manner possible, reducing the cost of compliance. Based on Annex I national communications, emissions growth in non-carbon dioxide greenhouse gases is expected to be much slower (and in some cases negative) than carbon dioxide emissions growth between 1990 and 2010. This indicates that the U.S. six-gas target is less stringent than implied by just an assessment of carbon dioxide alone, and that there could be greater cost-savings through international trading of all greenhouse gases than implied by assessments of carbon dioxide trading alone.

Another crucial aspect concerns the time frame of emissions abatement. As the Administration Economic Analysis on climate change noted, the Administration advocated and secured in the Kyoto Protocol a later and more realistic time frame for the initial emissions target than what had been proposed by other countries. By adopting a gradual and credible path of reductions in the early years, adjustment costs can be reduced. How one addresses the question of timing of reductions affects the modeling results. In EIA's study, most businesses do not take action to address climate change until 2005, and therefore only have a short time until the 2008-2012 budget window to reduce emissions. This essentially assumes that even though the Administration secured this more realistic commitment period to reduce the burden on firms by allowing them to more gradually undertake emissions reductions, very few firms would actually take advantage of such an opportunity. Studies have demonstrated that the amount of lead time a company takes has dramatic economic implications. For example with EIA's model in the Interagency Analytic Team draft report, a 5-year "ramp-up" (starting in 2005) would result in economic costs 65% greater than that associated with a 10-year "ramp-up" (starting in 2000). Thus, the assumption that many businesses would fail to plan for the future results in higher projected costs.

While some may claim that very little action is likely to occur prior to 2005, there is reason to believe that some firms will act voluntarily well before 2005. Already businesses are taking action to address climate change. For example, on September 18, British Petroleum announced its plan to reduce emissions of greenhouse gases worldwide by 10% below 1990 levels by the year 2010. In July, United Technologies announced their plan to reduce its worldwide energy consumption by 25% by the year 2007. Moreover, once the Protocol is ratified with the advice and consent of the Senate, we would expect more firms to respond and undertake more actions to abate emissions.

Finally, how an analysis addresses other policy issues that can affect the costs of abating emissions can also impact the conclusion regarding costs. In the Administration's analysis, additional elements of policy were recognized as having the potential to significantly decrease

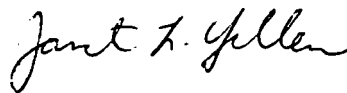
the costs of compliance and increase the amount of reductions that might be accomplished at home. These policies were not factored into the illustrative model the Administration cited, but were qualitatively taken into account in reaching the conclusion that the United States could meet its Kyoto target for a relatively modest cost. The EIA analysis, however, ignores elements such as afforestation and reforestation (covered under the Kyoto Protocol) and the Administration's electricity restructuring proposal, all of which could significantly lower compliance costs.

Implementing Legislation

The Administration will seek any necessary new implementing legislation at the appropriate time. While the Administration advocates the use of a domestic trading program during the 2008-2012 commitment period, no policy decisions have yet been made about the nature of this program. Thus, all aspects of the trading program, including the options to allocate permits based on historical emissions or to auction some or all permits and recycle the revenue back to the economy through cutting other taxes, are still under consideration.

The Administration continues to believe that the costs of achieving our Kyoto target will be modest if we are successful in securing rules for efficient international trading, joint implementation, and the Clean Development Mechanism, and if key developing countries meaningfully participate in the international effort to address climate change. Again, I appreciate this opportunity to share with you some of the latest insights from the economic modeling community and our perspective on the recent EIA analysis. If you have any questions, please feel free to contact me or have your staff follow-up with Joe Aldy on my staff at 202-395-1455.

Sincerely,

A handwritten signature in cursive script, reading "Janet L. Yellen".

Janet L. Yellen

The Honorable Jim Sensenbrenner, Jr.
Chairman
Committee on Science
U.S. House of Representatives
Room 2320 Rayburn House Office Building
Washington, D.C. 20515

American Federation of Labor and Congress of Industrial Organizations



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November 24, 1998

Dr. Janet Yellen, Chair
Council of Economic Advisers
17th and Pennsylvania Avenue, NW
Room 314
Washington, DC 20502

Dear Dr. Yellen,

Thank you for giving us the opportunity to meet with you and your staff regarding the Administration's climate change economic analysis. The meeting was very useful, and highlighted the many issues of deep concern that remain unresolved—even unexplored. In particular, I want to renew our request that the Administration conduct a detailed examination of the transition costs of climate change mitigation policies, with a specific emphasis on sectoral and regional economic and employment impacts, as well as distributional effects.

More specifically, reiterating several of the points we raised during the meeting, we strongly urge that the Administration undertake the following exercises:

- Using the SGM model, conduct sensitivity analyses with different AEEIF values, for example, 0.75 percent per year.
- Using the SGM model, evaluate the economic outcomes if economic growth rates of transition economies (i.e., Former Soviet Union, Eastern Europe) rise faster than assumed in your initial study.
- Examine, in-depth, the transition costs, regional and sectoral impacts, and income distributional effects of climate change policies.
- Evaluate the implications of different trading permit options on the U.S. balance of payments.
- Evaluate the macroeconomic and distributional consequences of different methods of permit allocations, most importantly auctioning with revenue recycling versus giving permits away. We were pleased that you showed an interest in exploring this issue. We believe auctioning could be

a major revenue generation mechanism for aiding transition of workers and communities with positive distributional impacts. At the same time, it would be very useful to examine the effects on demand and real wages of different allocation policies.

- Examine alternative trading scenarios involving trading caps, in contrast to the no caps position currently supported by the Administration. We believe that the United States may ultimately have to bend to the European Union position, and agree to some sort of domestic emissions reduction threshold. If so, the Administration will have to consider completely redoing its analysis, as caps would produce substantially different economic outcomes. It would be preferable to have this information to inform the ongoing negotiations rather than after the fact.

We recognize that by itself the CEA does not have the capability or resources to carry out such analyses. We also are aware that to conduct some of these studies, you would need to enlist the use of models other than the SGM. In principle, this might entail linking the outcomes of the SGM to short-term macroeconomic models (such as DRI's) with disequilibrium properties. However, the capacity to develop and employ such models and carry out the studies we have identified resides within federal agencies, such as the Department of Energy, EPA and Department of Labor, which also participated in the Administration's Interagency Analytical Team. It may make sense, in fact, for the Administration to reconstitute the IAT under the CEA's leadership, to take on this task.

We are surprised at the CEA's apparent reluctance to initiate new economic analyses along the lines that we have suggested, as they would help illuminate some of the most difficult and contentious policy issues regarding climate change mitigation. These studies would provide especially valuable insights into the process of developing worker and community transition strategies, as well as informing other agreed upon discussions between the White House and the labor community regarding utility deregulation and the coal industry. Moreover, it would be a clear sign of commitment on the part of the Administration to address transition issues, if it were to undertake the studies we recommend.

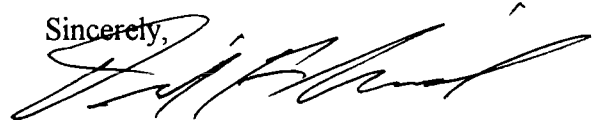
Finally, we have some specific information requests that would help us in our own analytical efforts. We would greatly appreciate your office providing the following types of information or guiding us to where they may be obtained:

- The SGM spreadsheets on diskette, so that we can download them onto our own computers.
- Full documentation regarding the Administration's assessment of the economic and environmental impacts of its utility deregulation proposal
- Full supporting documentation for the IAT report (e.g., the DRI study's sectoral print-outs).

Yellen Letter, November 24, 1998

Thank you again for the time and attention that you and your colleagues devoted to our concerns. We look forward to working closely with all of you, as well as others in the Administration, on these important questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'David A. Smith', with a stylized flourish at the end.

David A. Smith
AFL-CIO, Director Public Policy

Meeting w/AFL-CIO

Monday, November 23, 1998
11:00 a.m.

Re Climate Change

Contact: Jane Perkins: 637-5369

AFL-CIO

David Smith
Leslie Leopold
Joel Yudken
Thomas Palley
James P. Barrett
Michael Buckner
Jane Perkins

Labor

David Luna
William Samuel
Ed Montgomery

CEA

Janet Yellen
Jeffrey Frankel
Michele Jolin
Steve Polasky
Joe Aldy

Pre-brief w/Todd Stern (did not stay for meeting)

Karen Tramontano called to give her input but did not attend the pre-brief or the meeting



EMBASSY OF AUSTRALIA, WASHINGTON, DC
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cc: JY
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ADDRESSEE:	ORIGINATOR:
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DATE: 20 November, 1997	PAGES: 18
SUBJECT: CLIMATE CHANGE	

Please find attached a copy of the Australian Prime Minister's Statement on Climate Change.

Stephen Deady
Minister/Counsellor (Commercial)

**CLIMATE CHANGE
ANNOUNCEMENT OF PACKAGE OF MEASURES
BY THE PRIME MINISTER**

Following is a the text of the Australian Prime Minister's Statement on Climate Change delivered in the Parliament on 20 November 1997.

The Statement contains a strengthened package of domestic greenhouse measures. The package contains two key components:

- provides \$180 million over 5 years, mostly directed at new programs or substantially expanded existing programs
- includes regulations - covering strengthened building codes and appliance standards, targets for increased use of renewable energy and new fuel efficiency standards.

This package shows that the Australian Government is very serious about dealing effectively with this long term global challenge. The package will result in a substantial reduction in Australia's projected emissions growth (one-third off business as usual emissions). Also the Government will be moving to implement these measures immediately, independent of action by other countries and the outcomes of the Kyoto meeting. With these measures, Australia's overall effort is broadly comparable with what the EU and the US propose to achieve.

On the international negotiation issues, the PM's Statement reiterates that Australia believes that the international response to climate change must be effective in terms of meeting the environmental challenge, equitable in terms of the costs to be borne by individual countries and least damaging as possible to living standards and employment prospects. For these reasons Australia has proposed that individual targets for industrialised countries be differentiated according to national circumstances.

Australia also believes international emission trading would help minimise the costs of reducing emissions and supports trading on the basis of a satisfactory initial allocation of emission entitlements and a practical resolution of the administrative difficulties involved.

Australia looks to Kyoto to support joint implementation as a means of engaging developing countries in the global effort. Furthermore, because action by developed countries alone would be ineffective in tackling this global problem, the Kyoto outcome should provide for procedures and time frames for future commitments for major developing country emitters.

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**STATEMENT BY
THE PRIME MINISTER OF AUSTRALIA**

THE HON JOHN HOWARD MP

**SAFEGUARDING THE FUTURE:
AUSTRALIA'S RESPONSE TO CLIMATE CHANGE**

20 NOVEMBER 1997

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Since its election the Government has addressed the critical issue of global warming in a way that effectively promotes Australia's national interests.

Those interests lie both in protecting Australian jobs and Australian industry whilst ensuring that Australia plays her part in the world wide effort needed to reduce greenhouse gas emissions.

From the start, we have made it plain that Australia would not accept an unfair share of the burden. We have rejected and will continue to reject mandatory uniform targets which advantage many developed countries to the distinct disadvantage of countries such as Australia.

We have also made it plain that we are not prepared to see Australian jobs sacrificed and efficient Australian industries, particularly in the resources sector, robbed of their hard-earned, competitive advantage.

Moreover, we have persistently stressed the need to involve developing countries as their participation is crucial to any lasting solution to the global warming problem.

These principles have guided our approach.

There is now clear evidence that Australia's campaign for equity and realism has won wider support and so, far from our country being isolated on the issue, there is growing international support for the view that the approach of, say, the European Union is both unfair and unachievable.

We have an obligation to defend and protect Australian interests, Australian jobs and Australian industry. We also owe it to future generations of Australians to play an effective role in the global reduction of greenhouse gas emissions.

The Government's approach to development and the environment has been balanced and far sighted.

That approach is reflected in the \$1.25 billion Natural Heritage Trust. The Trust promotes practical ways to rejuvenate the land, rivers and oceans and is the most profound commitment of any government to the environment.

The same balanced approach is behind our Regional Forests Agreements where the practical commitment to equally boost jobs and protect forests has resulted in 409,000 hectares of additional reserves through the two agreements signed so far.

That balance is also reflected in the protection and management of our seas and oceans through the development of a national oceans policy. This will build on the \$106 million already provided through the Natural Heritage Trust for restoring the ocean environment.

This same consistent balanced and far-sighted approach has been applied to the greenhouse gas challenge.

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Today I announce the largest and most far-reaching package of measures to address climate change ever undertaken by any government in Australia.

The package carefully preserves a unique environment and lifestyle for our children's sake, defends wealth creating efficient industries and promotes lasting employment into the future. It provides a durable framework to promote Australia's national interest towards the year 2010 and beyond.

In a comprehensive manner, it replaces and far exceeds the random, disjointed projects of the previous government.

The world's climate scientists have provided us with a clear message - that the balance of evidence suggests humans are having a discernible influence on global climate.

What is required is sober, sensible but forward-looking action to reduce greenhouse gases and this is the approach my Government will adopt.

Although Australia contributes only 1.4 per cent of the world's greenhouse gas emissions we want to play our part in meeting this challenge. But pulling our weight doesn't mean carrying more than our share of the burden. Only with all countries working together, carrying equitable burdens, can we achieve an effective global outcome.

This will require creativity, persistence and in some instances, sacrifices - but the benefits of preserving our environment and quality of life for the sake of our children are too important to forgo.

PLAYING OUR PART - NEW DOMESTIC GREENHOUSE MEASURES

For various reasons Australia is unique.

Our economy has evolved on the basis of our abundant supply of natural resources and efficient production and processing of fossil fuels and mineral resources. Fossil fuels currently provide 94 per cent of our energy needs - far more than other OECD countries.

Our population is expected to grow by 30 per cent from 1990 to 2020 compared to less than three per cent in Europe.

We will continue to experience stronger economic and employment growth than most OECD countries.

Our cities are decentralised and widely separated, resulting in high transport use per capita compared to the smaller, closely populated European Union countries.

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Our trade profile means that about 20 per cent of our greenhouse gas emissions are embodied in our exports (notably aluminium and agricultural products) - double the OECD average and the highest in the industrialised world.

Our emissions profile is also unique amongst developed countries where the energy sector accounts for about half of our emissions, compared with an average of 80 per cent for OECD countries; and where land use and forestry account for around 20 per cent of Australia's emissions. This reflects the significance of agriculture to our economy.

In addition, Australia has a responsibility to export the resources necessary to fuel the growth of her regional partners and to provide the food required for their people.

For all of these reasons our emissions are projected to grow faster than other countries. Uniform target proposals that do not take these circumstances into account will place an unfair penalty on Australia.

Reducing emissions growth is therefore particularly challenging and is more costly for us than for most other industrial countries. But we are still committed to playing our part in cutting emissions.

Without further action, Australia's emissions are expected to grow by around 28 per cent from 1990 to 2010. This is based on a comprehensive approach excluding land use change. Emissions from the energy sector alone are expected to grow by around 40 per cent.

The package I announce today will achieve a dramatic reduction of a third in our expected net emissions growth from 1990 to 2010.

These measures will reduce our net emissions growth from 28 to 18 per cent in that period, or some 39 million tonnes of emissions. This is comparable to the emissions from all the electricity used by households right across Australia.

This is a realistic, even conservative, calculation of the emission benefits. The benefits from plantations and land use changes, for example, could well be greater than we have estimated. With the most effective implementation of the package, the full support of industry and the community, and the best contribution of the States and Territories we may well achieve even greater reductions.

Taken with greenhouse measures Australia already has in place the package will mean Australia's effort broadly compares on the same basis to what the United States and the European Union are proposing. Moreover, we are not waiting for others to act.

None of us should underestimate the commitment required to achieve these outcomes. They will require hard work from all of us. The package gives the lie to those who make exaggerated but ultimately empty claims that fine sounding targets can easily be achieved.

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The measures have been developed against the background of our national circumstances and our national interest. They also have been developed against achievements by Australia to date such as reform of our electricity and gas markets, halving the amount of waste going into landfill by the year 2000 compared to 1990 levels and the efforts of particular industries such as the aluminium industry which will reduce emissions by more than 20 per cent over the same period.

The Government is seeking realistic, cost effective reductions in key sectors where emissions are high or growing strongly while also fairly spreading the burden of action across our economy.

The package will allow us to improve the performance of our highly competitive energy dependent sectors while also stimulating new sectors such as renewable energy. It will demonstrate we can improve the environment whilst generating new jobs and exports. Far from risking 90,000 potential jobs, as would be the case if we accepted some proposals, the measures I announce have the potential to create wealth and jobs.

They address emissions across many sectors - residential, industry, transport, energy, agriculture, forestry and government operations - in an integrated, effective, and above all, fair way.

We are prepared to ask industry to do more than they may otherwise be prepared to do, that is, to go beyond a 'no regrets', minimal cost approach where this is sensible in order to achieve effective and meaningful outcomes.

The Government is providing \$180 million over five years for these measures. This is a significant sum by any standards and a substantial increase in funding. This package far exceeds the efforts by previous governments on addressing the greenhouse problem.

Most of this expenditure will be spent on completely new measures, while some existing programs will be substantially expanded.

Importantly, the level of Commonwealth expenditure does not represent the whole story. These initiatives will stimulate additional actions and investment by the States and Territories, industry, and in some cases, consumers.

Our measures build on those in the draft National Greenhouse Strategy. State and Territory leaders have indicated their support for our greenhouse response and have agreed to work with us co-operatively in implementing it and in considering further action of their own.

Let me outline the specific measures.

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Renewable Energy

Renewable forms of energy currently contribute about six per cent to Australia's total energy needs, an amount comparable to the OECD average of 6.4 per cent. The Government will be committing \$65 million to ensure this level is increased.

By contributing \$21 million, we will create a specialist renewable energy innovation investment fund to provide government and private sector venture capital for companies with high growth potential.

So that we can capitalise on our skills we will provide a \$30 million loans and grants programme for the development and commercialisation of the renewable energy industry. This will directly support the creation of new businesses, jobs and exports. This funding represents a huge increase on the \$4.8 million over four years spent by the previous government on the Renewable Energy Industry Programme.

And we will also provide \$10 million for some leading edge renewable energy 'showcase' projects in areas such as tidal power solar thermal power and photovoltaic technologies.

The Government will work with the States and Territories to set a mandatory target for electricity retailers to source an additional two per cent of their electricity from renewable energy sources by 2010. This will accelerate the uptake of renewable energy in grid-based electricity and provide a larger base for the development of commercially competitive renewable energy.

This enormous boost to renewable energy development is a huge improvement on programmes such as the Energy Research and Development Corporation which had been overtaken by changes in the energy sector.

Our new programmes will stimulate innovative technologies and wealth-creating businesses and energy suppliers who provide power to communities, employ Australians and export to the world. It is an action-oriented approach.

Energy Market Reform

The possibilities for fuel substitution and innovation will be enhanced as we continue and accelerate the process of energy market reform.

We will work with the States and industry to develop and implement by the year 2000, efficiency standards for fossil fuel electricity generation, including for brown and black coal and gas fired plants.

This will ensure the adoption of best practice new technology in each fossil fuel class. Standards will also be phased in to encourage emissions reductions in existing plants. The standards will apply to new electricity generation projects and existing generation.

These initiatives mean that Australian energy suppliers will be able to stand tall when it comes to being clean, green and cost competitive.

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Automotive Industry

In 1995, ten per cent of Australia's net emissions were generated by cars, four wheel drives and light commercial vehicles.

We will implement an Automotive Industry Environmental Strategy, in consultation with the automotive and oil industries and other stakeholders, to enhance the industry's environmental performance.

This strategy will involve several elements including:

- mandatory, model specific, fuel efficiency labelling;
- harmonised noxious emissions standards with international standards by 2006;
- a 15 per cent fuel efficiency improvement target by 2010 over business as usual through negotiation with automotive companies; and
- bringing forward the phase-out of leaded petrol, taking equity considerations into account.

The Government will also develop a basic network of compressed natural gas refuelling stations in selected metropolitan areas to encourage light commercial vehicles to switch to this more environmentally friendly fuel.

These measures will reduce air pollution and improve the health of our cities as well as reducing greenhouse gas emissions.

Codes and Standards

The Government will also work with the States, Territories and industry to develop energy efficiency codes and standards for housing and commercial buildings, appliances and equipment

For industrial and commercial appliances and equipment we will implement an improved labelling programme and minimum energy performance standards.

We will expand the Nationwide House Energy Rating Scheme by including a minimum energy performance requirement for new houses and major extensions and we will work with the States, Territories and industry to develop voluntary minimum energy performance standards for new and substantially refurbished commercial buildings.

These initiatives will take us to best practice standards in these important areas. If this voluntary approach does not achieve acceptable progress within 12 months, we will work to implement mandatory standards.

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Tree Planting and Revegetation

Plantations and revegetation are important means of soaking up greenhouse emissions - known as greenhouse sinks.

The Government will work to remove impediments to the development of commercial plantations to achieve the Plantations 2020 vision of trebling the plantation estate by 2020. We will establish a Bush for Greenhouse Programme to encourage corporate funding of revegetation projects to act as sinks.

This will build on the \$22 million for farm forestry and the massive \$328 million revegetation programme being undertaken under the Bushcare Initiative of the Natural Heritage Trust, which represents the largest revegetation effort ever undertaken with almost a tenfold increase on the funding of revegetation programmes of the previous Government.

Greenhouse Challenge programme

The Greenhouse Challenge programme is central to the partnership between government and industry to reduce emissions.

This programme currently has 100 signed agreements with businesses from a wide range of sectors.

In total, companies that have signed agreements account for over 45 per cent of Australia's industrial emissions.

Participants have committed themselves to reduce their forecast growth in emissions by about 22 million tonnes of carbon dioxide equivalent by the year 2000.

The announcement today provides extra funding of \$27 million to extend the programme to smaller companies and to increase the number of large and medium company participants to 500 by the year 2000 and to more than 1000 companies by 2005.

Commonwealth Greenhouse Office

In order to ensure this package of measures is delivered a Commonwealth Greenhouse Office will be established within the Department of the Environment. This Office will have responsibility for the coordination of domestic climate change policy.

The Office will be the lead Commonwealth agency on greenhouse matters. It will provide a mechanism to ensure domestic greenhouse matters receive the priority the issue deserves and the Government intends.

Other Measures

Further measures as part of this statement include action to reduce emissions in urban areas, initiatives to work toward best energy practice in targeted industries, funding

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towards a ethanol pilot plant, the development of a national carbon accounting system, funding to support various National Greenhouse Strategy related measures, and additional funding to ensure commercial joint implementation projects in developing countries.

We are also committed to reducing emissions from the Commonwealth Government's own operations, including purchases of more energy efficient equipment and appliances. We will be setting fuel consumption targets for the Commonwealth vehicle fleet.

AUSTRALIA'S APPROACH: FORWARD LOOKING AND GLOBAL

The Government believes that like our national effort, the international response to climate change must be effective in terms of meeting the environmental challenge, equitable in terms of the costs to be borne by individual countries and least damaging as possible to the living standards and employment prospects of our people.

For these reasons Australia has proposed that individual targets for industrialised countries be differentiated according to national circumstances.

Uniform target proposals based on a 1990 base year would impose a disproportionate burden on Australia. The cost to our economy of meeting a uniform target of the order proposed by the European Union would impose a cost on all Australians that other countries would not accept.

Some industries fundamental to the health of our economy would be hardest hit. The non-ferrous metals, iron and steel and coal industries would be seriously affected, and future investment and employment growth would be jeopardised.

Even stabilising our emissions at 1990 levels would put at risk \$68 billion of energy intensive projects and the tens of thousands of potential jobs that go with them.

Significant regional dislocation would result in places like the Illawarra and Hunter Valley in New South Wales, the Bowen Basin and Gladstone in Queensland, Geelong and the La Trobe Valley in Victoria, Port Pirie in South Australia and the Kwinana region of Western Australia.

Moreover, the European Community is not asking its own members to reach a uniform target. Portugal for example, would be permitted to increase its emissions by almost 40 per cent.

We reject this approach of punishing Australian industries to carry a burden that other countries are not prepared to accept. It is far more sensible and responsible to improve the performance of existing industries and build new green industries to provide for both jobs and the environment.

We believe the way forward is for all countries to play a fair part, with flexibility in the methods used to reach the targets.

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We strongly support a comprehensive approach to setting targets which covers all greenhouse gases, emission sources, sinks and sectors. The wider the coverage the greater the flexibility to maximise environmental benefit and minimise economic cost.

Australia also believes that an international emissions trading regime would help minimise costs of reducing emissions. We would support emissions trading on the basis of a satisfactory initial allocation of emission entitlements and a practical resolution of the administrative difficulties involved.

Joint implementation measures whereby developed countries can work with developing countries on emission reduction projects can achieve worthwhile outcomes. Australia is looking to Kyoto to support joint implementation as a means of engaging developing countries in the global effort.

All along we have argued that climate change is a global problem and all countries should contribute to the solution. Action by developed countries alone will be ineffective. Over time, developing countries must become involved - as by early next century they will account for over 50 per cent of global emissions.

The Kyoto outcome should provide for procedures and timeframes for negotiating targets by major developing country emitters.

Australia's proposal for negotiated, differentiated targets is the best basis for a fair outcome which has a prospect of actually being put into practice and improving the world's environment. It is also the best basis for encouraging developing countries to take on commitments to reduce emissions.

The Government has said it would not agree to legally binding targets until their nature and content and implications for Australia are clear. We will not agree to any targets that impose substantial costs on Australia that are not faced by other OECD countries.

CONCLUSION

With the package of measures I have announced today, the Government is not posturing for negotiating purposes with theoretical targets but is already taking practical steps to reduce Australia's greenhouse gas emissions.

It is a package that goes well beyond what any previous government has sought to do. It is a package that puts Australia at the forefront of international action. And it is a package that Australia will implement even if the international community fails to reach agreement at Kyoto.

As I have demonstrated to date, my Government will continue to stand up for our national interest, jobs and economy in the international negotiations.

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We will not agree to an outcome that burdens us in an unfair manner.

My Government has had some success in our efforts to argue the case that an effective result at Kyoto will require an equitable approach. We have managed to shift the international debate. As a result of our efforts, there is greater recognition of the need to take into account individual national circumstances if there is to be a successful outcome - as the British Prime Minister, Mr Blair, acknowledged in our recent discussions.

There is also greater recognition of the need for flexibility to ensure countries can make a contribution to the global effort - as President Clinton acknowledged in my meeting with him in June.

At the South Pacific Forum and most recently at CHOGM we were successful in gaining acceptance of the need for global engagement by both developed and developing countries.

Nevertheless, let there be no doubt the Kyoto negotiations will be difficult.

Australia's Environment Minister, Senator Robert Hill, who will be leading our delegation at Kyoto, will be doing his utmost to secure an agreement that will both be fair to Australia and be effective in reducing global emissions.

Ultimately, the success of our domestic measures depends upon the goodwill, commitment and action by ordinary Australians, consumers, families, firms and industry groups, as well as Governments Federal, State, and local. The greenhouse challenge is theirs and quality of life of our children depends upon their strength of purpose.

Mr Speaker, I present a copy of my statement and an appendix which provides further details of the measures I have announced today.

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APPENDIX

COMMONWEALTH GREENHOUSE MEASURES

Residential

\$
million

Cities for Climate Protection The Cities for Climate Protection is a voluntary scheme through which local governments quantify their emissions, then develop and implement action plans to reduce them, particularly through community partnerships. It is based on the International Cities for Climate Protection Campaign programme developed by the International Council of Local Environment Initiatives.	13.0
Household Greenhouse Action Household greenhouse action will bring together the various spheres of government, key industries and professional organisations in broadly based partnerships to develop integrated, consistent and effective strategies to address residential greenhouse emissions. Demonstration projects and the development of best practice guides will be undertaken to promote energy efficiency services and products as a key concern in housing design, redevelopment and use. Energy efficiency rating schemes will be integrated into relevant approval processes for new homes and major renovations.	2.2

Industry

\$
million

Extension and Expansion of the Greenhouse Challenge Office – Government/Industry Co-operative Agreements Programme This programme will be expanded to involve more large and medium companies and to include small businesses through an innovative Greenhouse Allies programme. The objective of the programme is to reduce the greenhouse gases emitted by industry enterprises. The programme involves enterprises identifying the scope to reduce emissions, putting into place action plans to achieve this outcome and monitoring and reporting on performance. It will expand to 500 the number of large and medium size companies to join the programme by 2000, and to more than 1,000 by 2005.	27.1
Energy Performance Codes and Standards for Domestic Appliances and Industrial Equipment The measure will reduce greenhouse gas emissions by improving the energy efficiency of appliances and equipment. The programme enhances and extends existing energy efficiency programmes. It involves the development of minimum energy performance standards for new appliances and equipment, regulating or developing codes of practice to ensure their adoption and, where appropriate, labelling or rating appliances and equipment to help consumers in their selection.	4.4

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Energy Performance Codes and Standards for Housing and Commercial Buildings The measure involves expansion of the Nationwide House Energy Rating Scheme (NatHERS) by including a minimum energy performance requirement for new housing and extensions to improve energy efficiency and reduce greenhouse gas emissions. The Commonwealth will work with the States, Territories and key industry stakeholders to develop voluntary minimum energy performance standards for new and substantially refurbished commercial buildings on the basis of energy efficiency benchmarks. If after twelve months the government assesses that the voluntary approach is not achieving acceptable progress towards higher standards of energy efficiency for housing and commercial buildings, we will work with the States and industry to implement mandatory standards through amendment of the Building Code of Australia.	4.4
Industry Efficiency Benchmarking and Best Practice The measure involves industry associations and government working together to identify types, extent and patterns of energy use within sectors, the improvement potential of enterprises within that sector based on best practice and working on strategies to implement best practice and to monitor progress. The benchmarks and best practice indicators will be provided for use by the Greenhouse Challenge programme to assist in formulating cooperative agreements.	10.3

Transport

\$
million

Environmental Strategy for Automotive Industry This strategy aims to significantly enhance the environmental performance of the automotive industry through a range of measures including: mandatory fuel efficiency labelling through Australian design rules; bringing forward the phase out of leaded fuel, taking equity considerations into account; progressive tightening of noxious emissions standards with a view to harmonisation with international standards by 2006; negotiations with the automotive industry and companies to secure a 15 per cent fuel efficiency improvement target by 2010 over business as usual (recognising that the scope for model and design change will increase progressively from 2003) within the National Average Fuel Consumption framework; and the development of options for challenging but realistic fuel efficiency targets for the Commonwealth car fleet from 2003.	0.5
Light Commercial Vehicles – Compressed Natural Gas (CNG) Infrastructure This will facilitate a switch to the use of natural gas in light commercial vehicles through the establishment of a distribution network of service stations in collaboration with natural gas companies and local government authorities. The programme aims to establish a minimum refuelling network, firstly in Sydney and Melbourne, with possible extension to other major urban centres.	3.8
Ethanol Pilot Plant (funding previously announced) An ethanol pilot plant will be built to demonstrate new Australian technologies for the production of ethanol from wood fibres and simultaneous waste treatment. It is anticipated that the ethanol pilot plant will realise substantial net greenhouse gas reduction, urban air quality and economic benefits greater than all existing fuel ethanol production technologies.	2.0

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Energy**\$
million**

Accelerating Energy Market Reform The objective is to lower the rate of growth of emissions by improving the economic efficiency of energy supply. The measure will expand energy market reforms to extend electricity reform, deliver integrated and compatible national frameworks for gas and electricity by 2002, and with the States develop the means to identify greenhouse intensity of energy sources in energy market trading pools by 2001.	5.6
Efficiency Standards for Power Generation The Commonwealth will work with the States to achieve movement towards best practice in the efficiency of electricity generation conversion by implementing efficiency standards for different fossil fuel classes, so as to deliver reductions in the greenhouse gas intensity of energy supply. Standards will apply to new electricity generation projects, significant refurbishments and existing generation.	4.1
Mandatory Targets for the Uptake of Renewable Energy in Power Supplies Targets will be set for the inclusion of renewable energy in electricity generation by the year 2010. Electricity retailers and other large electricity buyers will be legally required to source an additional 2% of their electricity from renewable or specified waste-product energy sources by 2010 (including through direct investment in alternative renewable energy sources such as solar water heaters). This will accelerate the uptake of renewable energy in grid-based power applications, and provide an ongoing base for commercially competitive renewable energy. The programme will also contribute to the development of internationally competitive industries which could participate effectively in the burgeoning Asian energy market.	3.8

Renewables**\$
million**

Renewable Energy Innovation Investment Fund (REIF) The REIF will provide funding specifically for the facilitation of commercialisation and application of renewable energy technologies. All initial investments will be required to be in the early stages of company development. Government funding will be provided through licences to REIF fund managers on a competitive basis and invested along with private sector funding on a 2:1 basis.	21.0
Renewable Energy Technology Commercialisation Loans and Grants The competitive loans and grants programme will provide support for, and promotion of, strategically important renewable energy initiatives that have strong commercial potential. This will be integrated with the existing Renewable Energy Industry Programme.	29.6
Renewable Energy Showcase A few leading edge "showcase" projects will be selected via competitive tender for seed funding and/or promotion. These could include projects which are close to becoming commercial, such as tidal power projects; solar thermal projects and a central photovoltaic generating project in a technology park.	10.5
Renewable Energy Technology Internet Site Funding for the development of a sophisticated and up-to-date Internet site on renewable technologies along the lines of that operated by the US Department of Energy to provide information on technologies, examples of their application and available government assistance.	0.3

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International**\$
million**

Activities Implemented Jointly Additional funding for the AIJ Office, to facilitate commercial projects in developing countries and help meet the additional transaction costs incurred by business in undertaking a AIJ project. This will provide Australian industry with a greater incentive to undertake such projects.	6.0
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Revegetation, Plantations and Land Use**\$
million**

Plantations – 2020 vision The objective of the programme is to implement key Commonwealth responsibilities of the Plantations 2020 Visions which aims to treble Australia's plantation estate by 2020 and thereby increase carbon sequestration. In collaboration with State governments and industry, the programme involves removing impediments to Australian commercial plantations and supporting plantation establishment and enhancing investment in plantation-based industries.	1.9
Bush for Greenhouse The uptake of carbon dioxide in trees and vegetation offers significant potential to reduce the overall level of Australia's greenhouse gas emissions. This initiative will facilitate corporate funding of Natural Heritage Trust revegetation projects through Bushcare. Companies or investors will obtain recognition for the stored carbon reservoir created. By allowing companies to invest in revegetation activities, companies will have a method to offset emissions created by their activities elsewhere. Projects selected would have significant carbon sink potential and would meet the range of other Bushcare objectives.	5.5
National Carbon Accounting System for Land Based Sources and Sinks This measure will establish a national carbon accounting system through the Bureau of Resource Sciences (BRS) and Environment Australia (EA) to be managed by a high level steering committee including key stakeholders. A consolidated package will provide the comprehensive framework and scientific services necessary to account for Australia's emission reduction and sink enhancement programmes to an internationally credible standard. Data on Australia's carbon stocks will be verified by satellite monitoring and audited by on-ground sampling procedures. This form of carbon accounting, which has been adopted by the IPCC, will enable Australia to benefit from the full 'carbon value' of its sink development initiatives such as Plantations 2020 vision and Bush for Greenhouse.	12.5
Reducing Methane Emissions from Livestock This measure will provide funding to promote a CSIRO developed vaccine which inhibits the production of methane in the rumen of livestock.	1.0

Government Operations**\$
million**

Energy Efficiency Improvement in Commonwealth Operations The objective of this measure is to reduce the energy consumption and greenhouse gas emissions of Commonwealth operations and, by so doing, lead the community by example. The programme involves setting mandatory targets, use of performance contracting, monitoring and reporting on performance, the development of minimum energy performance standards for new and refurbished buildings, appliances and equipment and a requirement for utilisation of solar and other renewable energy technologies where relevant and cost effective.	0
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Institutional Arrangements\$
million

Establishment of the Commonwealth Greenhouse Office Implementation of greenhouse response measures is fragmented across a number of agencies and there is a lack of coordination in delivery. A 'Commonwealth Greenhouse Office' will be created within the Department of the Environment, which will be responsible for coordination of domestic climate change policy and delivery of greenhouse response programmes. The office will be the lead Commonwealth agency on greenhouse matters.	0
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Other Measures\$
million

Funding for other National Greenhouse Strategy related Commonwealth measures Details to be finalised in consultation with the States and Territories.	10.5
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TOTAL

(Total does not add due to rounding)

179.9

EPRI

August 20, 1998

Dr. Janet Yellen
Chair
Council of Economic Advisers
Old Executive Office Building
Washington, DC 20502

cc: JAF
JA
SD
QF

Dear Janet:

Alan Manne and I thought you might be interested in the enclosed draft "The Kyoto Protocol: A Cost-Effective Strategy for Meeting Environmental Objectives?". The paper results from our involvement in the ongoing Energy Modeling Forum-16 study on the impacts of proposals for dealing with the threat of global climate change. Any comments or suggestions would be most welcomed.

Best regards,



Richard Richels
Director, Global Climate Change Research

The Kyoto Protocol: A Cost-Effective Strategy for Meeting Environmental Objectives?

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July 27, 1998

This research results from our involvement in Stanford University's Energy Modeling Forum 16 Study. The authors are indebted to James Deaker and Robert Parkin for their research assistance. We have benefited from discussions with Jae Edmonds, Henry Jacoby, David Montgomery, William Nordhaus, Stephen Peck, Thomas Rutherford, and John Weyant. Funding was provided by EPRI. The results presented here are solely those of the individual authors.

1. Introduction

The Kyoto Protocol represents a milestone in climate policy.¹ For the first time, negotiators have attempted to lay out emission reduction targets for the early part of the 21st century. The goal is for Annex 1 (developed countries plus economies in transition) to reduce their aggregate anthropogenic carbon dioxide equivalent emissions by at least 5 percent below 1990 levels in the commitment period 2008 to 2012. The Protocol, however, has yet to enter into force. To do so will require ratification by 55 countries representing 55 percent of total Annex 1 CO₂ emissions in 1990.

As each country considers ratification, important questions will arise. High up on the US list is the issue of economic costs. The Senate, for example, has stated that “any Protocol should be accompanied by a detailed financial analysis of impacts on the economy.”² Not surprisingly, US negotiators had hardly returned from Kyoto before the first hearings were scheduled on Capitol Hill. Although the issue of costs is but one of many important considerations, policy makers are keenly interested in the economic implications of ratification.

This paper is intended to help clarify our understanding of compliance costs. The focus is on three questions, which we believe to be of particular relevance: What are the near-term costs of implementation? How significant are the so-called “flexibility provisions”? And, perhaps most importantly, is the Protocol cost-effective in the context of the long-term goals of the Framework Convention?³

Unfortunately, the answers to these questions will not come easily. It has always been difficult to calculate the economic costs of implementing climate policy. Kyoto has done little to simplify matters. Indeed, it raises at least as many questions as it resolves. These questions fall into two categories: those related to the near-term implementation of the Protocol and those related to the evolution of climate policy over the longer term.

The Protocol is unclear on a number of topics. These include the rules governing emission trading, joint implementation (JI), the Clean Development Mechanism (CDM), and the treatment of carbon sinks. In addition, there is a weak knowledge base regarding the costs of sink enhancement and of controlling several of the relevant trace gases. Until these issues are clarified, analyses will be highly speculative.

Calculating the costs of Kyoto is also complicated by the issue of “what happens next?” Energy sector investments are typically long-lived. Today’s investment decisions are not only influenced by what happens during the next decade, but also by what happens thereafter. In order to estimate the costs of implementing emission cuts in the first commitment period, assumptions are required concerning the longer-term requirements. Unfortunately, the international negotiation process offers little guidance on this issue. This further complicates the process of analysis.

We do not wish to suggest that economic analysis is premature at the present time. Uncertainty is rarely an excuse for paralysis. It does mean, however, that we must be

careful to highlight the tentative nature of the projections and focus, to the extent possible, on the insights for decision making. Here, sensitivity analysis can be particularly useful. For example, in the case of several of the flexibility provisions (emission trading, joint implementation and the Clean Development Mechanism), we explore a variety of scenarios regarding constraints on the purchase of carbon emission rights. While the exact magnitude of the benefits will continue to be debated, the insights, nevertheless, appear to be quite robust.

We also examine the Protocol in the context of the longer-term goal of the Framework Convention, i.e., the stabilization of greenhouse gas concentrations in the earth's atmosphere. A particular concentration goal can be reached through a variety of emission pathways. Considerable effort has been devoted to trying to understand the characteristics of cost-effective pathways.⁴ It is interesting to examine Kyoto in the context of this work. The price tag for moving forward may be formidable. Consistent with the Framework Convention, it is essential that "policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible costs."⁵

2. The model

This analysis is based on MERGE (a model for evaluating the regional and global effects of greenhouse gas reduction policies).^{6,7} MERGE is an intertemporal market equilibrium model. It combines a bottom-up representation of the energy supply sector together with a top-down perspective on the remainder of the economy. Savings and investment decisions are modeled as though each of the regions maximizes the discounted utility of its consumption subject to an intertemporal wealth constraint. Each region's wealth includes not only capital, labor and exhaustible resources, but also its negotiated international share in carbon emission rights.

For the present version of the model, known as MERGE 3.0, we have adopted 10-year time intervals through 2050 and 25-year intervals through 2100. Geographically, the world is divided into nine geopolitical regions: 1) the USA, 2) OECD (Western Europe), 3) Japan, 4) CANZ (Canada, Australia and New Zealand), 5) EEFSU (Eastern Europe and the Former Soviet Union), 6) China, 7) India, 8) MOPEC (Mexico and OPEC) and, 9) ROW (the rest of world). Note that the OECD (regions 1 through 4) together with EEFSU constitute Annex 1 of the Framework Convention.

Particularly relevant for the present analyses, MERGE provides a general equilibrium formulation of the global economy. We model the possibility of international trade in carbon emission rights. This is sometimes known as "where" flexibility. It would allow regions with high marginal abatement costs to purchase emission rights from regions with low marginal abatement costs. In addition, MERGE can be used to examine the related issue of "when" flexibility - intertemporal transfers of carbon emission rights.

We also model international trade in oil, natural gas, and energy-intensive basic materials. We are therefore able to examine issues related to "carbon leakage". Such leakage can occur through a variety of pathways. For example, Annex 1 emission

reductions will result in lower oil demand, which in turn will lead to a decline in the international price of oil. As a result, non-Annex 1 countries may increase their oil imports and emit more than they would otherwise.

The present version of the model includes the notion of endogenous technical diffusion. Specifically, in the electric sector, the near-term adoption of high-cost carbon-free technologies leads to accelerated future introduction of lower cost versions. The model also includes both price-induced and non-price conservation. For most regions and time periods, the AEEI (autonomous energy efficiency improvement) rate is taken to be 40% of the rate of GDP growth. By 2100, this leads to regional energy-GDP ratios that are much closer to each other than they were in 1990.

In calibrating MERGE for the present analysis, several supply- and demand-side parameters were adjusted so that the global emissions baseline would approximate the Intergovernmental Panel on Climate Change (IPCC) central case “no policy” scenario (IS92a).⁸ Figure 2.1 shows carbon emissions for each region in the reference case scenario. For more on the model and its key assumptions, see our website:

<http://www-leland.stanford.edu/group/MERGE/>

3. Treatment of sinks and non-CO2 greenhouse gases

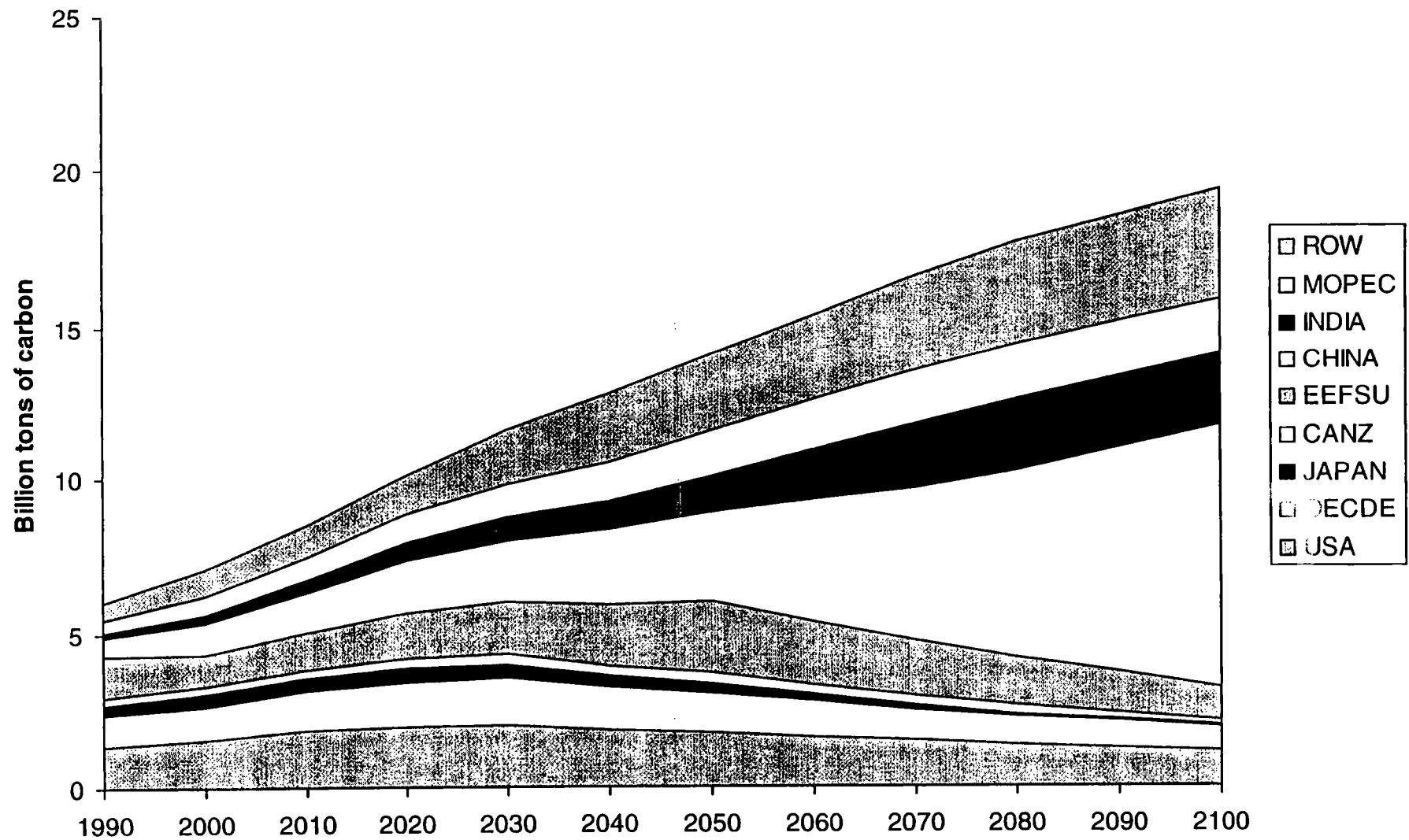
Few issues have engendered as much confusion as that of carbon sinks. Key questions include their definition, the extent to which they are included in the Protocol, the amount currently being sequestered, their time profile, and the costs of sink enhancement.

The Protocol states that Annex 1 commitments can be met by “the net changes in greenhouse gas emissions from sources and removal by sinks resulting from direct human-induced land use change and forestry activities limited to afforestation, reforestation, and deforestation since 1990, measured as verifiable changes in stocks in each commitment period.”⁹ The confusion results from alternative interpretations regarding the treatment of soil carbon, an issue flagged for further study in the Protocol. Their inclusion may result in large increases in the international legal definition of sink potential.

The quality of the data is uneven. The supply curves for sink enhancement are particularly questionable. The degree of confidence concerning current and predicted future levels of carbon sequestration varies enormously across regions of the globe. Not surprisingly, information is most reliable (albeit still poor) for Annex 1 countries. Comparatively little effort has been made to collect such data elsewhere.

As placeholders, we have adopted the values shown in Table 1. To provide some perspective, in order for the US to reduce industrial carbon emissions by 7% below 1990 levels in 2010, it would have to reduce emissions by approximately 550 million tons below its reference trajectory. Sink enhancement would satisfy 9 percent of this

Figure 2.1 Regional Carbon Emissions -- reference case



obligation. For purposes of the present analysis, we assume that this sink enhancement is costless.

Table 1. Sink Enhancement (million metric tons of carbon annually)

USA	50
OECD	17
Japan	0
CANZ	50
EEFSU	34

CO₂ is by far the most important of the greenhouse gases. In addition, the Protocol includes five other trace gases (methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride). Given the scarcity of reliable emissions and cost data, the treatment of the non-CO₂ greenhouse gases is also problematic. For purposes of the present analysis, we assume that each gas is reduced proportionately. With this proportionality assumption, the inclusion of the non-CO₂ greenhouse gases does not affect the requirements for CO₂ reductions.

As with our treatment of sinks, we do not include the costs of abating the non-CO₂ greenhouse gases in our estimates of the costs of complying with the Protocol. Clearly, an important next step would be to develop supply curves for the cost of abating non-CO₂ greenhouse gases and for sink enhancement. Neither of these costs is included in the present version of MERGE.

4. "Kyoto Forever"

We begin with an examination of a "Kyoto Forever" scenario. This is a case in which the Kyoto constraints on Annex 1 countries are maintained throughout the 21st century. With regard to non-Annex 1 emissions, we assume they will continue to be bounded by their business-as-usual baseline (Figure 2.1). The latter constraint is imposed in order to prevent carbon leakage. Later on, we will explore the impact of relaxing this constraint.

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.¹⁰ The Kyoto Protocol includes several provisions allowing for a limited amount of "where" flexibility. These include emission trading and joint implementation among Annex 1 countries. They also include provisions for a Clean Development Mechanism (CDM) that is intended to facilitate joint implementation between Annex 1 and non-Annex 1 countries.

As with the definition of sinks, the Protocol leaves many critical details unresolved. For example, it remains unclear whether there will be limits on the extent to which a country can rely upon the purchase of emission rights to satisfy its obligations. The Protocol states that "the Conference of the Parties shall define the relevant principles, modalities, rules and guidelines ..."¹¹ Similar ambiguity surrounds the Clean Development

Mechanism. Again, the elaboration of “modalities and procedures” is left to a future meeting of the Conference of the Parties.¹²

In this section, we explore three scenarios: 1) no trading, 2) Annex 1 trading plus CDM, and 3) full global trading. These three options are representative of alternative implementations of the Kyoto Protocol. Each has its own advocates and opponents, but we do not consider them equally likely. In our opinion, there is little likelihood of enticing all major countries to participate in a global market in emission rights during the initial commitment period (2008-2012).

The full global trading scenario places an upper bound on the CDM’s potential to reduce GDP losses. In calculating the potential size of the contribution from a CDM, we therefore calculate this upper bound on the export of emission rights from non-Annex 1 regions. Because of the difficulties in implementation of the CDM, however, we assume that only 15% of the potential would be available for purchase through this mechanism. This is a highly subjective estimate. Given the complexities of the CDM, however, we are not inclined to assign a higher value

Figure 4.1 reports the incremental value of carbon emission rights to the US in 2010 and 2020. We focus first on 2010. In the most constrained scenario, the US must satisfy its emission reduction requirements within its own geographical boundaries. In this case, the value of emission rights approaches \$240 per ton. With Annex 1 trading plus CDM, the value drops to slightly less than \$100 per ton. As might be expected, the value of emission rights is lowest with full global trading. Here, it falls below \$70 per ton.

For the two scenarios in which trading is permitted, the value of emission rights increases in 2020. This is because EEFSU’s projected emissions lie below its negotiated constraint for 2010. It has been allocated more emission rights than it needs to satisfy its internal obligations. By 2020, however, EEFSU’s economic growth is expected to be such that it no longer enjoys an excess of emission rights. As a result, there is more competition for emission rights in the international marketplace, and there is an increase in their price.

Another way to view the costs of abatement is to show the GDP losses. Figure 4.2 contains those for the US. Losses are highest in the absence of trade. Here, they exceed \$80 billion dollars in 2010. This is approximately one percent of US GDP. To the extent that trade is introduced, losses decline. In the most optimistic scenario (full global trade), losses are approximately \$20 billion or one-quarter of one percent of GDP in 2010.

Of the three scenarios, “Annex 1 trading plus the CDM” is most consistent with the Protocol as it currently stands. However, the US Senate has stated that the US should not be a signatory to the Protocol if it does not mandate specific commitments for developing countries.¹³ If this were to result in full global emission trading, we move in the direction of the right-most bar of Figure 4.2.

There is, however, strong sentiment among many parties to the Framework Convention to substantially limit the extent to which Annex 1 countries can meet their obligation

Figure 4.1 Incremental Value of Carbon Emission Rights in US Under Kyoto Forever

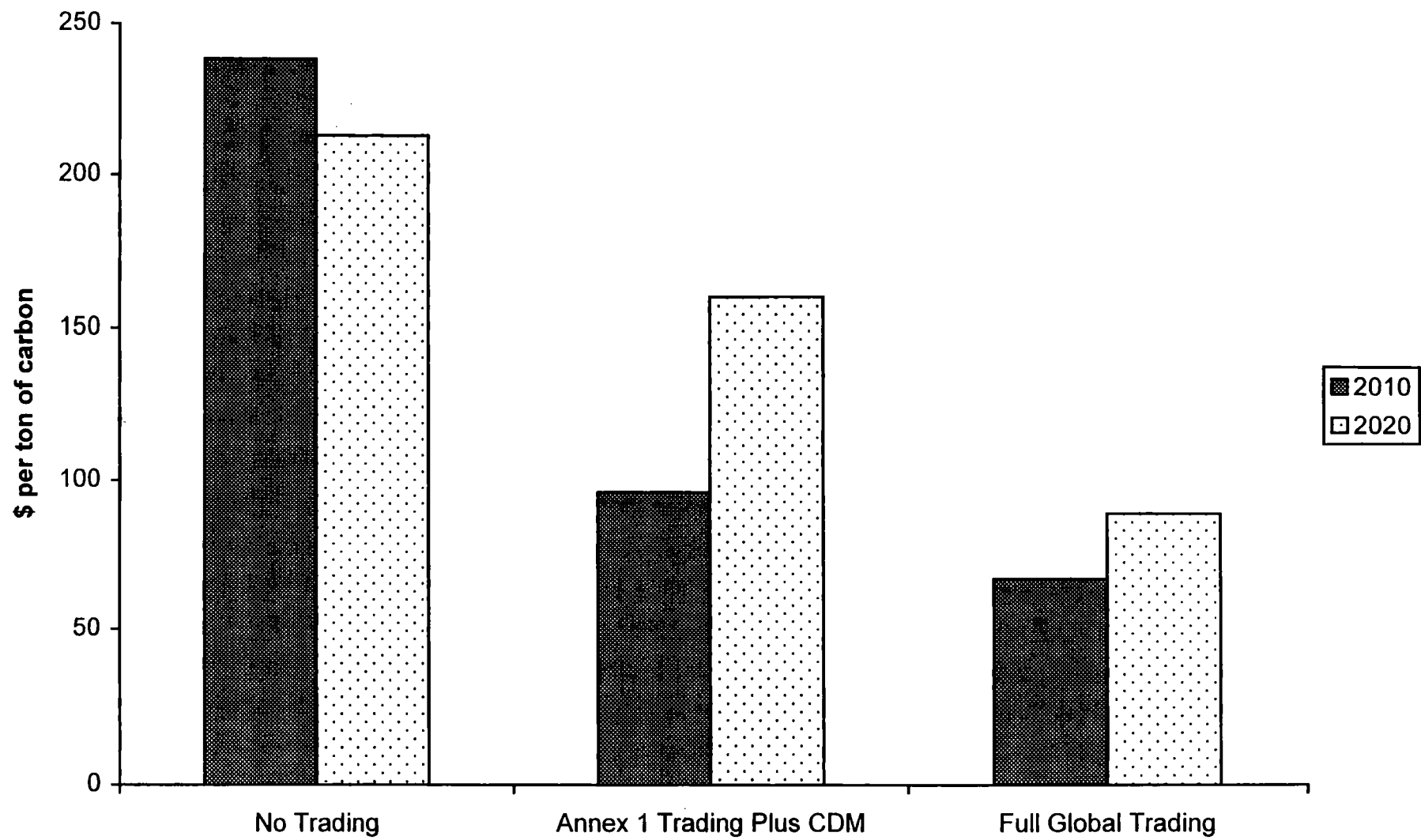
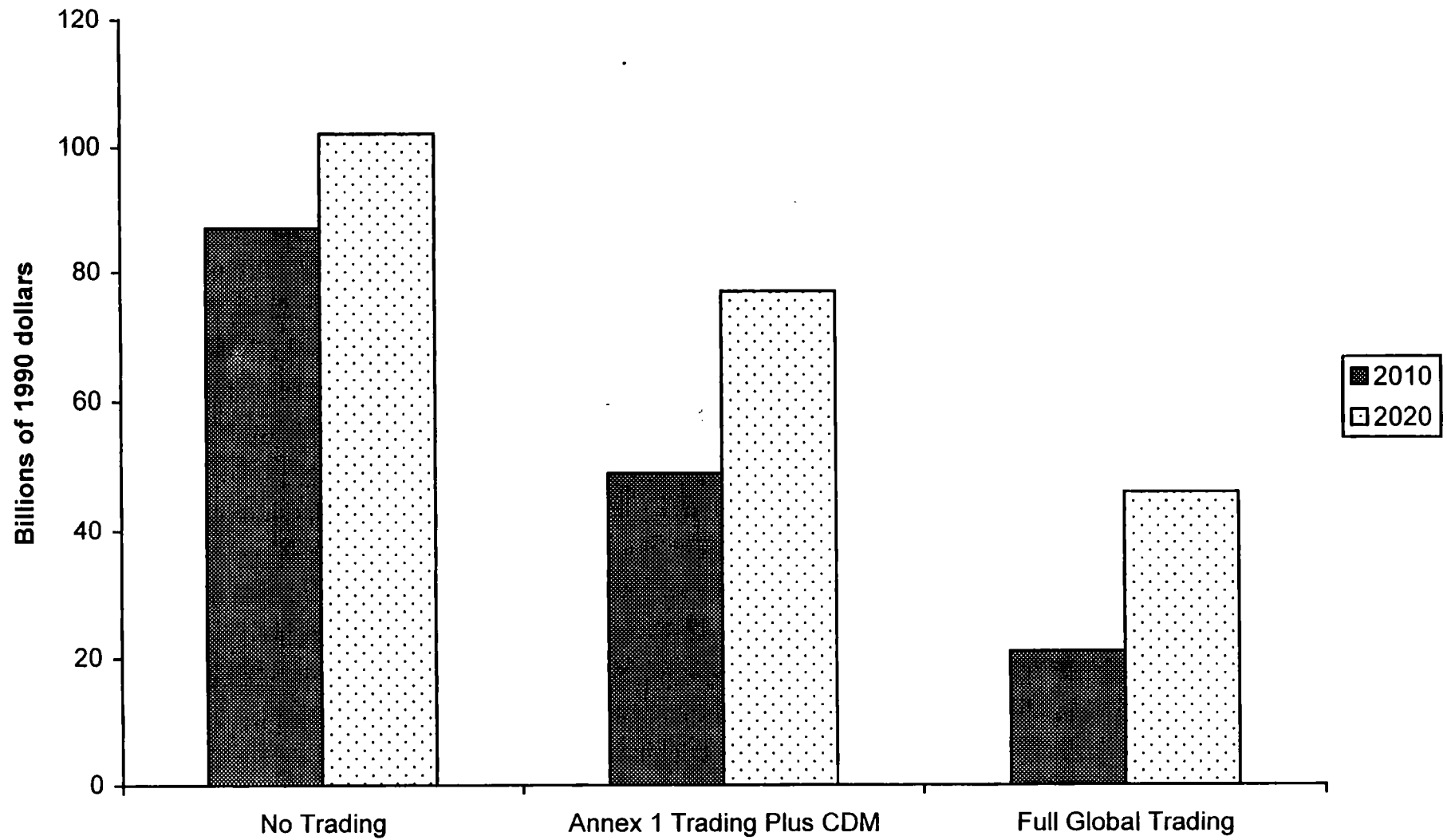


**Figure 4.2 Annual US GDP Losses Under Kyoto Forever
(\$ billions)**



through the purchase of emission rights. Several influential developing countries have expressed strong opposition to the concept altogether. Figure 4.2 shows the costs of the no trading scenario. We now turn to the case where trading is permitted, but with limitations on the purchase of emission rights.

5. Limits on the purchase of carbon emission rights

Figure 5.1 shows our estimates of the percentage of the US emission reduction obligation that would be satisfied through the purchase of emission rights under base case assumptions. With full global trading (the least-cost of our three scenarios), trading is used to satisfy more than 50% of the US obligation. But suppose that limits are placed on the purchase of emission rights? For example, suppose that international negotiators agree that Annex 1 buyers can satisfy only one-third of their obligation through this means. What would be the impact on GDP losses?

Figure 5.2 compares three cases. All assume full global participation in an international market for carbon emission rights, but only the first assumes no limits on the amount a country can buy. The second and third case are based upon the one-third limitation. We further make the distinction between a buyers' market and a sellers' market. With the former, sellers of emission rights are price takers. Buyers exert sufficient market power to hold the international price to the marginal cost of abatement in the selling countries. However, since a country is only able to satisfy one-third of its obligation through the purchase of emission rights, it must eventually rely on its own domestic marginal abatement capabilities to meet its obligations. Hence, there is an important distinction between the international price and the domestic price. Conversely, with a sellers' market, buyers face but one price. Here, the rents accrue to the sellers.

Figure 5.3 shows the GDP losses associated with the three scenarios. Note that losses in 2010 are two and one-half to three times higher with the constraint on the purchase of carbon emission rights. That is, the benefits from "where" flexibility are greatly diminished. The message is clear. Developing country participation in the market for carbon emission rights is a necessary, but by no means a sufficient condition for reaping the full benefits of "where" flexibility. To achieve a cost-effective solution, buyers must also be unconstrained in the manner in which they fulfill their obligation.

Also note that the distribution of the rents makes a difference to GDP losses. US losses are 25% higher in 2020 when market power resides with the sellers. The analysis provides an additional message for Annex 1 buyers. If at a given point in time, low-cost sellers are concentrated among a few countries (e.g., EEFSU), they may have considerable potential for extracting monopoly rents.

6. The issue of carbon leakage

The Kyoto Protocol refers specifically to the period centered about 2010. During this period, the onus for emission reductions falls on Annex 1. No specific obligations are imposed on countries outside Annex 1, and there is the possibility of "leakage". That is,

Figure 5.1 Percent of US Obligation Satisfied Through the Purchase of Emission Rights

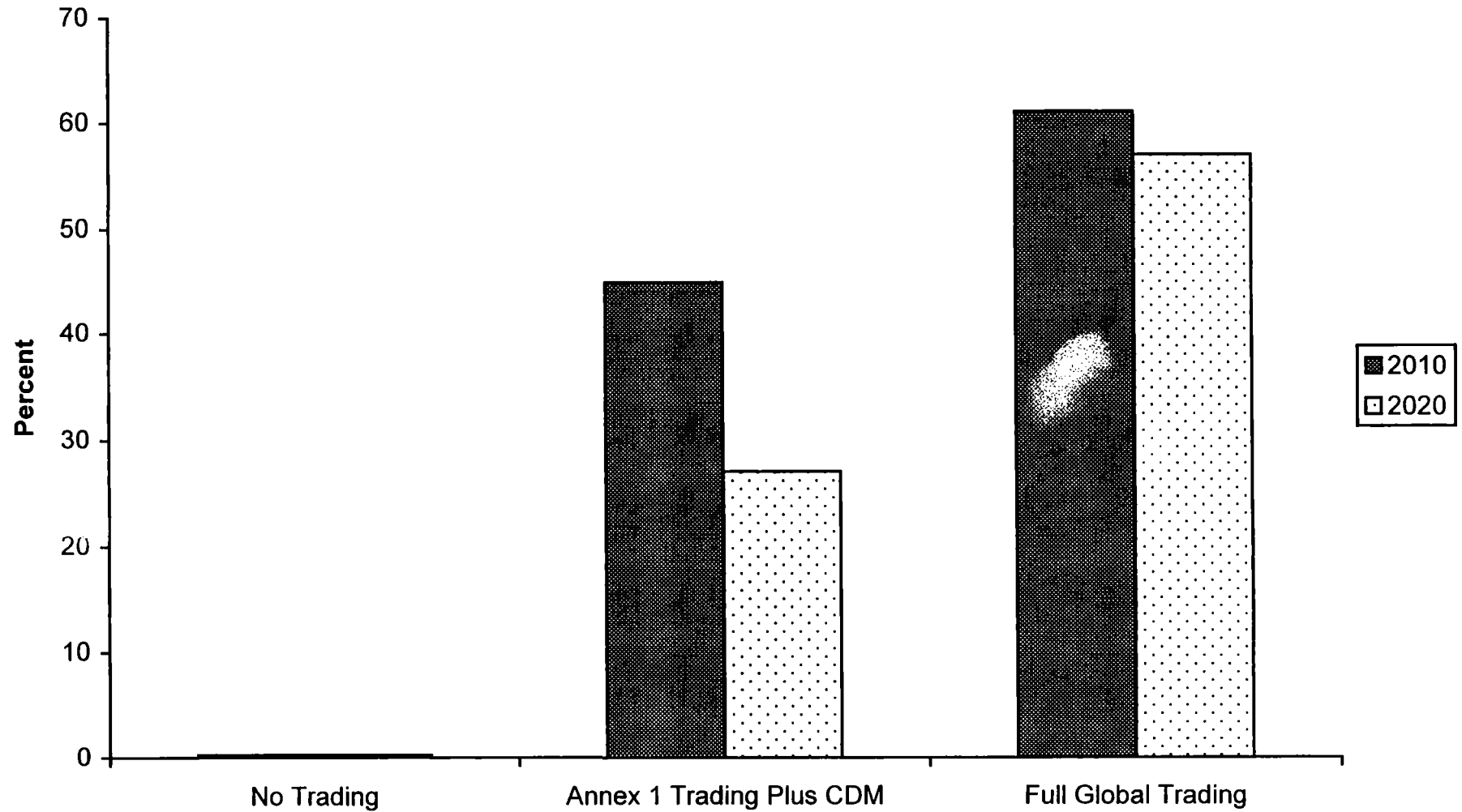


Figure 5.2 Incremental Value of Carbon Emission Rights With and Without Limits on the Purchase of Emission Rights -- Kyoto Forever

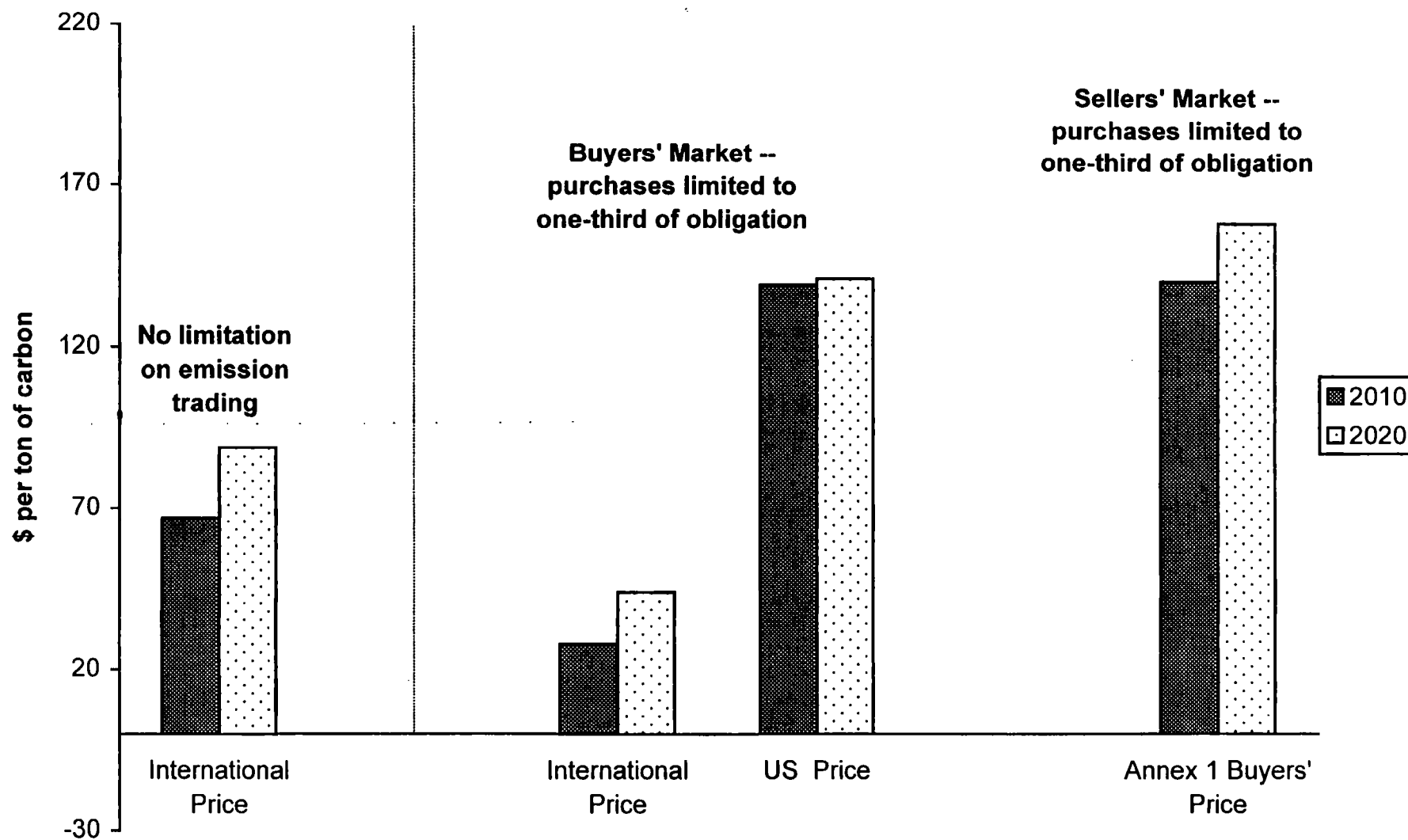
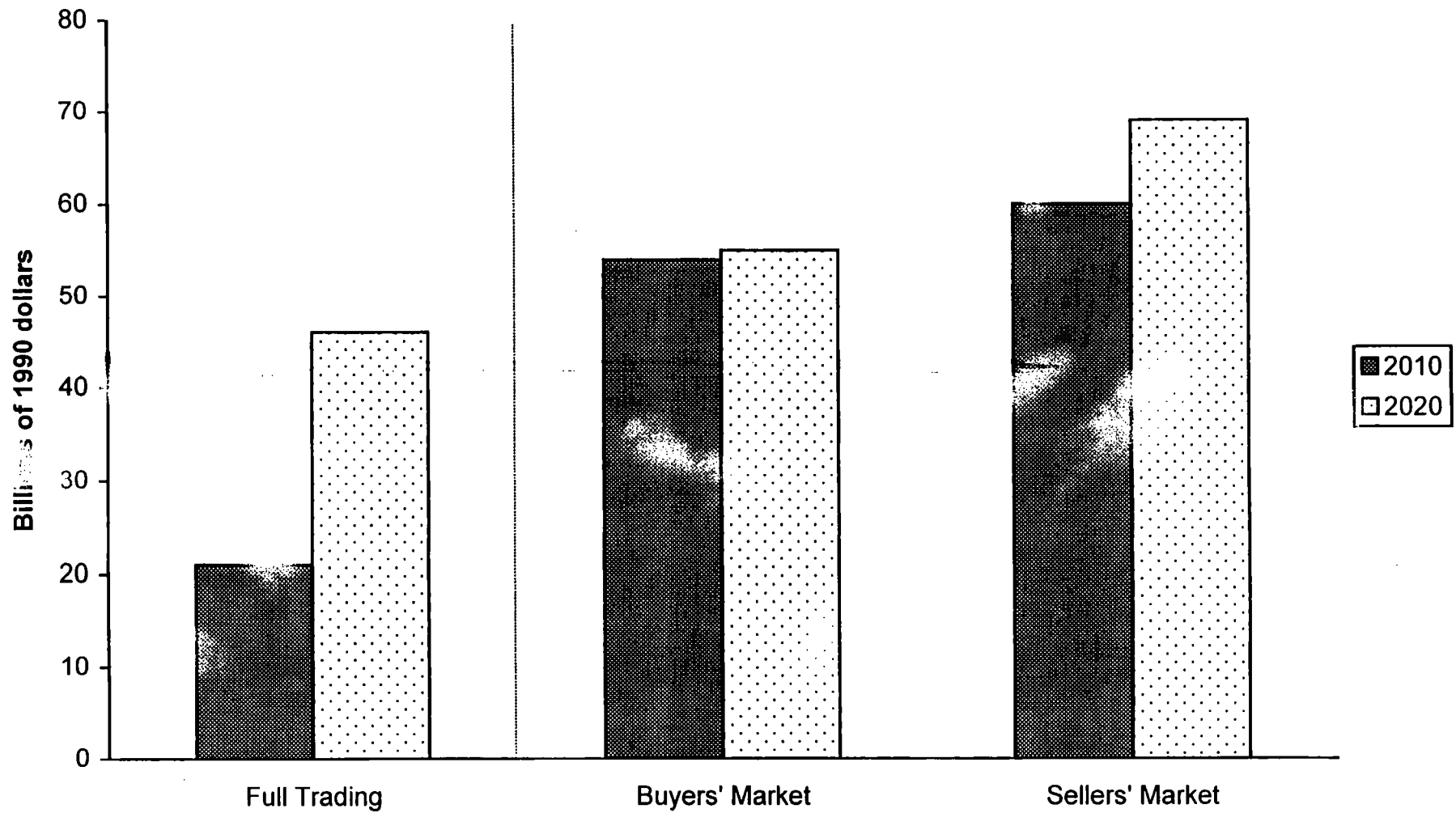


Figure 5.3 Annual US GDP Losses with Full Trading - Annex 1 May Satisfy Only One-Third of Obligation Through the Purchase of Emission Rights -- Kyoto Forever



the reductions in Annex 1 might be partially offset by increased emissions from China, India, Brazil and other countries that do *not* belong to Annex 1.

In this section, we examine the potential for leakage through international fuel markets and through the migration of energy-intensive industries. We therefore drop the assumption that non-Annex 1 countries are constrained to their reference case emissions. Two variants on the reference scenario are reported. In the first, the only trade impact of the Protocol consists of limiting the ability of the Annex 1 countries to import oil and gas. There is a lower international price of these goods, and there is a modest increase in price-induced demands by non-Annex 1 countries. However, there is no international trade in carbon emission rights, and there is no international migration of production within the energy-intensive sectors (EIS).

The second alternative is the same as the first, except that we now permit EIS trade. For a description of how the model has been modified to account for international trade in the energy-intensive sectors, see Appendix A. Figure 6.1 summarizes the overall results. According to this figure, neither of the two trade alternatives leads to a dramatic increase in carbon emissions outside Annex 1. Apparently there is an international leakage problem, but it appears to be of manageable dimensions.

Figure 6.2 suggests a somewhat different interpretation. Here we report the EIS trade scenario, and we compare the impact upon production-consumption ratios in each region. Under the reference case, these ratios are close to unity (the horizontal line) in most regions. The bars in Figure 6.2 show that the Protocol could lead to serious competitive problems for EIS producers in the USA, Japan and OECD Europe. The Protocol would lead to significant reductions in their output and employment, and there would be offsetting increases in regions with low energy costs. One can easily anticipate calls for protection against “unfair competition”. In its present form, the Protocol could lead to acrimonious conflicts between those who advocate free international trade and those who advocate a low-carbon global environment.

7. Evaluating Kyoto in the context of the longer-term goal

The objective of the Framework Convention is “the stabilization of greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system.”¹⁴ The drafters of the Protocol focused exclusively on the initial steps to be taken by Annex 1 countries. Little attention was paid to the ultimate goal. We now examine the Protocol in the context of a long-term stabilization objective.

From Figure 2.1 it is clear that the “Kyoto Forever” scenario will fail to stabilize global emissions and concentrations. A particular concentration target can be achieved through a variety of emission pathways. In this section, we explore three pathways for stabilizing concentrations at 550ppmv (twice preindustrial levels) by 2100. We stress, however, that the issue of what constitutes “dangerous interference” has yet to be determined. Indeed, it is likely to be the subject of intense scientific and political debate for decades to come. Hence, our choice of a target is meant to be purely illustrative.

**Figure 6.1 Carbon Emissions Outside Annex 1 --
Alternative Leakage Scenarios**

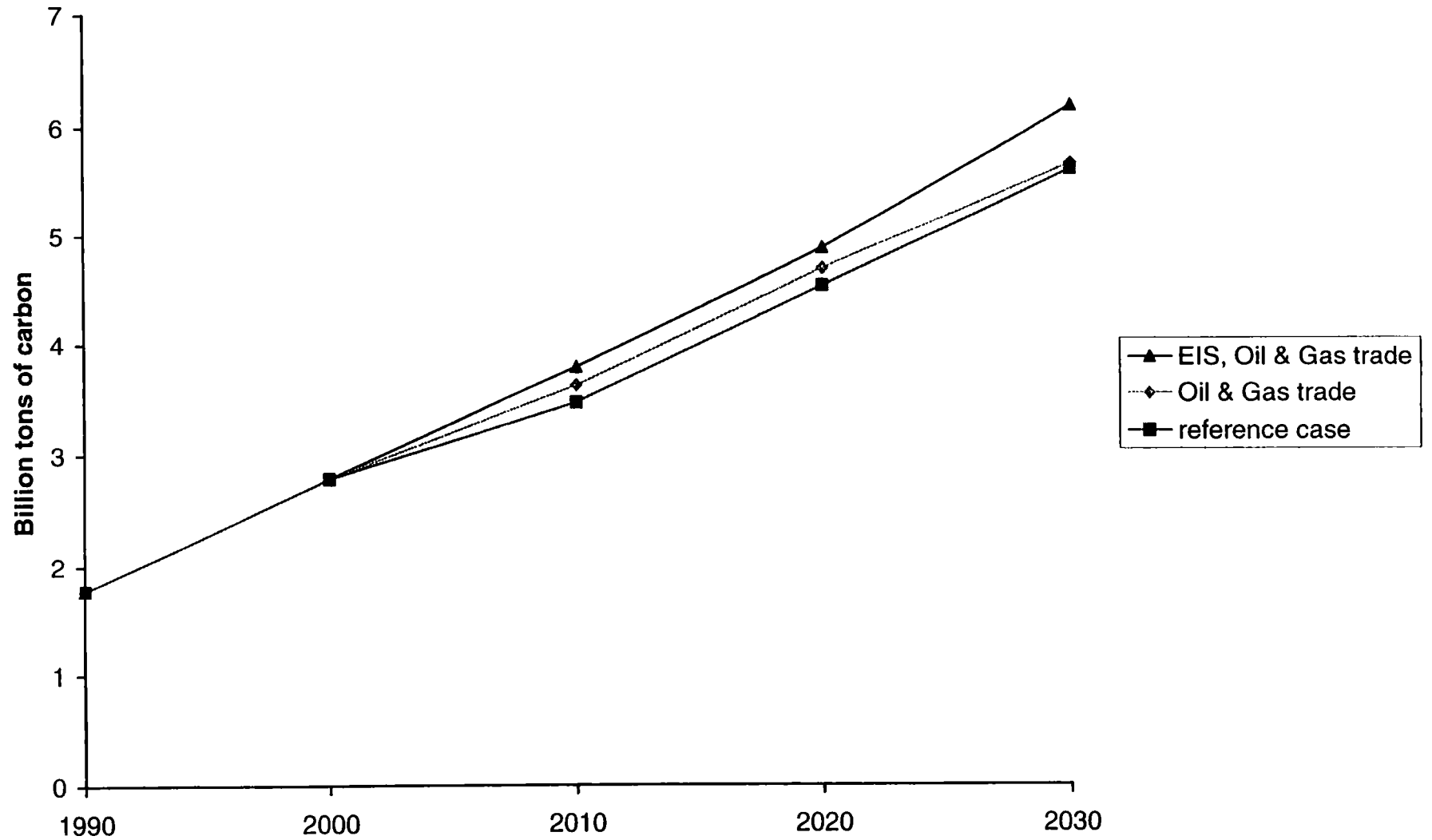
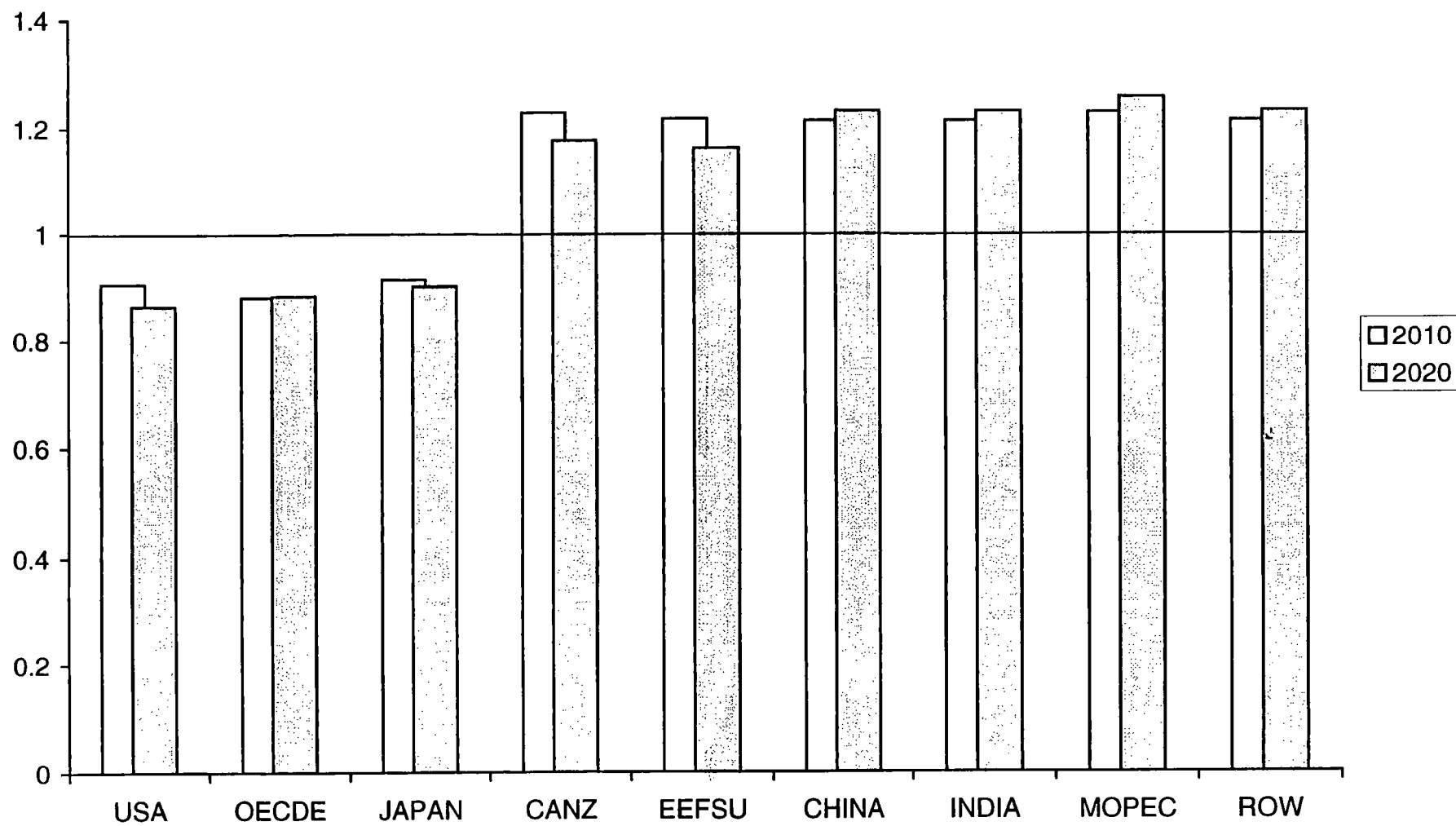


Figure 6.2 Ratios of Domestic EIS Supplies to Demands -- Kyoto with Leakage



Our three pathways are intended to illustrate the benefits of “when” flexibility. They are titled: 1) “Kyoto followed by arbitrary reductions”; 2) “Kyoto followed by least-cost”; and, 3) “least-cost”. As their names imply, the first two are designed to be consistent with the Protocol during the first commitment period. The third assumes a clean slate in the choice of emissions pathway throughout the 21st century.

For the first scenario, we assume that Annex 1 countries reduce emissions through 2030 at the same rate as the OECD during the first decade of the 21st century (2% per year). During this period, non Annex-1 countries are permitted to emit up to their reference case levels. By 2020, emissions in the developing nations are larger than those in Annex I. We then choose a pathway to stabilization which represents a relatively smooth transition to the target. As for the post-2030 burden-sharing scheme, we assume that between 2030 and 2050 all regions move to equal per capita emission rights (based on their 1990 population). Equal per capita emission rights have been proposed as one approach to international fairness, but there are others that might also serve to separate the issue of equity from that of economic efficiency.

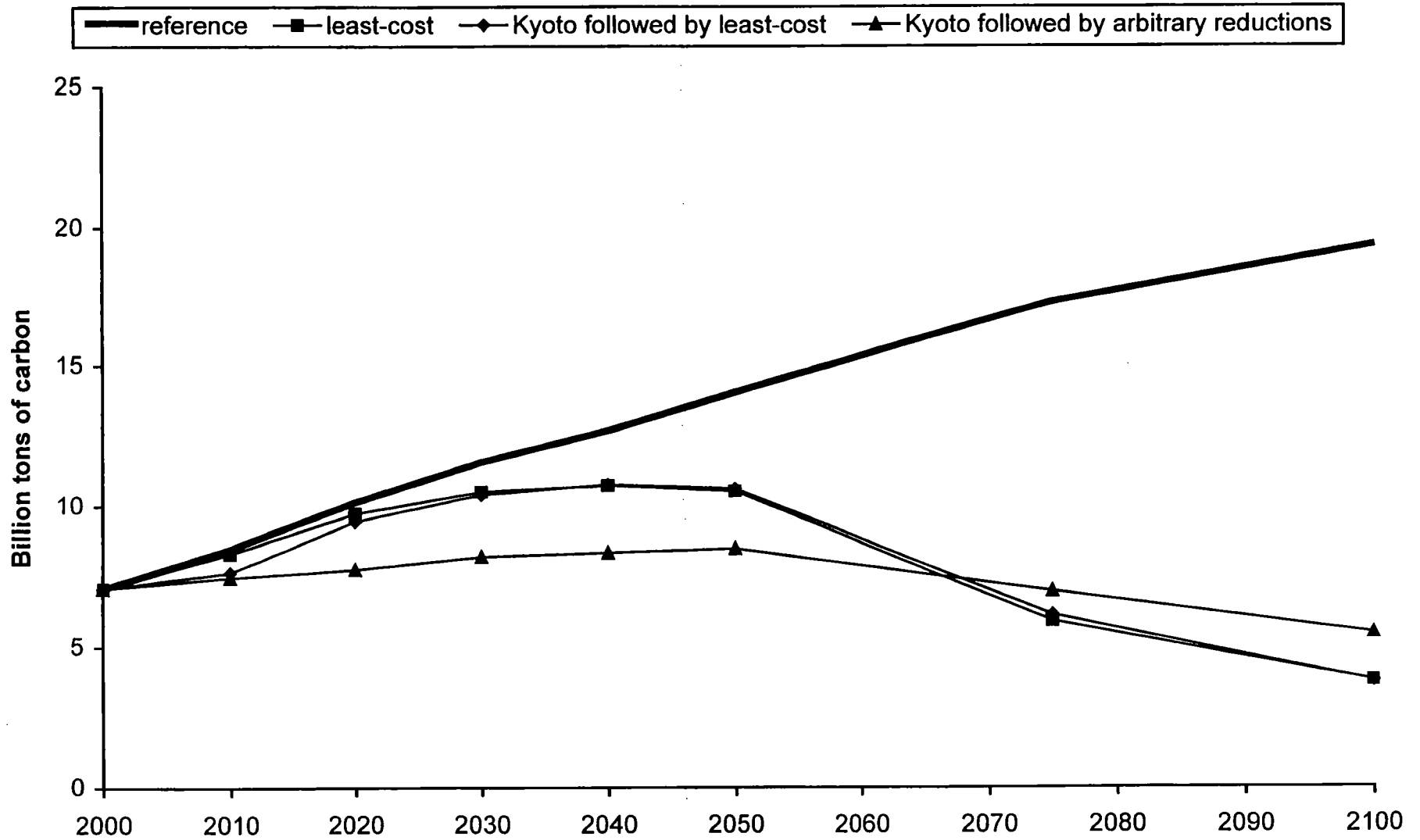
With “Kyoto followed by least-cost”, the Protocol is adopted for the initial commitment period. Thereafter, the most cost-effective pathway is followed for stabilizing concentrations at 550ppmv. With “least-cost”, the most cost-effective pathway for stabilizing concentrations at 550ppmv is followed from the outset. The latter two scenarios adopt the same proportionate burden-sharing scheme as the first.

All three scenarios assume Annex 1 trading plus the CDM. However, they differ as to the timing of developing country involvement in the international market for carbon emission rights. By definition, least-cost assumes that emission reductions will be made where it is cheapest to do so, regardless of the geographical location. Hence, in the least-cost scenario, we assume global emission trading from the outset. In the case of “Kyoto followed by least-cost”, we assume that global emission trading is delayed until after the first commitment period. With “Kyoto followed by arbitrary reductions”, global emission trading does not begin until 2030, the year that developing countries agree to lower their emissions below business-as-usual.

Global carbon emissions. Figure 7.1 shows global carbon emissions for the reference case and the three stabilization scenarios. Following a least-cost strategy from the outset results in an emissions pathway that tracks the reference path through 2010 and then departs at an increasing rate thereafter. There are several reasons why a gradual transition to a less carbon-intensive economy is preferable to one involving sharper near-term reductions.

Concentrations at a given point in time are determined more by cumulative, rather than year-by-year, emissions. Indeed, a concentration target defines an approximate carbon budget, i.e., an amount of carbon that can be emitted between now and the date at which the target is to be reached. At issue is the optimal allocation of the budget. Reasons for relying more heavily on the budget in the early years include: 1) providing more time for the economic turnover of existing plant and equipment, 2) providing more time to

Figure 7.1 Global Carbon Emissions -- Reference Case and Three Alternative Emission Pathways for Stabilizing Concentrations at 550ppmv



develop low-cost substitutes to carbon-intensive technologies, 3) providing more time to remove carbon from the atmosphere via the carbon cycle, and 4) the effect of time discounting on mitigation costs.¹⁵

We next turn to the two scenarios where we adopt the Protocol for the first commitment period. Notice that the two emission pathways behave quite differently post-2010. “Kyoto followed by least-cost” follows the least-cost pathway once the Protocol’s constraints are relaxed. “Kyoto followed by arbitrary reductions”, on the other hand, bears no resemblance to the least-cost pathway. What is striking about Figure 7.1 is that with a 550ppmv target, the Protocol is inconsistent with the most cost-effective mitigation pathway, i.e. “least-cost”. Indeed, it appears that the ultimate target would have to be considerably lower than 550ppmv for the Protocol to be justified in terms of cost-effectiveness.

Near-term losses. It is instructive to look at the incremental value of emission rights for the three stabilization scenarios (Figure 7.2). With the least-cost path, the value is relatively low in the early years (\$11 per ton of carbon in 2010), and it rises gradually over time. With “Kyoto followed by least-cost”, the value is \$130 per ton in 2010 and then tracks the least-cost path thereafter. In the case labeled “Kyoto followed by arbitrary reductions”, the incremental value of emission rights starts at about \$160 per ton and it remains high.

Figure 7.3 shows US GDP losses in 2010 and 2020 under the three stabilization scenarios. Notice that GDP losses in 2010 differ for the two scenarios involving the initial adoption of the Protocol. Because of the long-lived nature of energy investments, investors are concerned both with what happens in the initial commitment period and what happens thereafter. In the case of the more rapid transition away from the baseline (“Kyoto followed by arbitrary reductions”), investors will be forced to invest more heavily in high-cost substitutes in the early years. With “Kyoto followed by least-cost”, they will have more flexibility.

It is striking by how much GDP losses can be lowered under the “least-cost” scenario. This strategy involves a more gradual transition away from the baseline in the early years. It relieves much of the pressure for premature retirement of existing plant and equipment and for dependence on high-cost substitutes (both on the supply- and demand-sides of the energy sector). Relative to the reference case, the US also receives some benefits as an oil importer. Recall that a carbon constraint decreases the overall demand for oil and lowers its price on the international market.

Global losses. Finally, it is instructive to examine losses from a global perspective (Figure 7.4). For purposes of the present comparison, we focus on the present value of consumption losses over the 21st century discounted to 1990 at 5 percent. The relative magnitude of the cumulative losses for the three stabilization scenarios comes as no surprise given the previous discussion. “Kyoto followed by arbitrary reductions” is by far the most expensive of the three paths. “Kyoto followed by least-cost” is a considerable

Figure 7.2 Incremental Value of Carbon Emission Rights under Three Alternative Emission Pathways for Stabilizing Concentrations at 550ppmv -- Global Trading

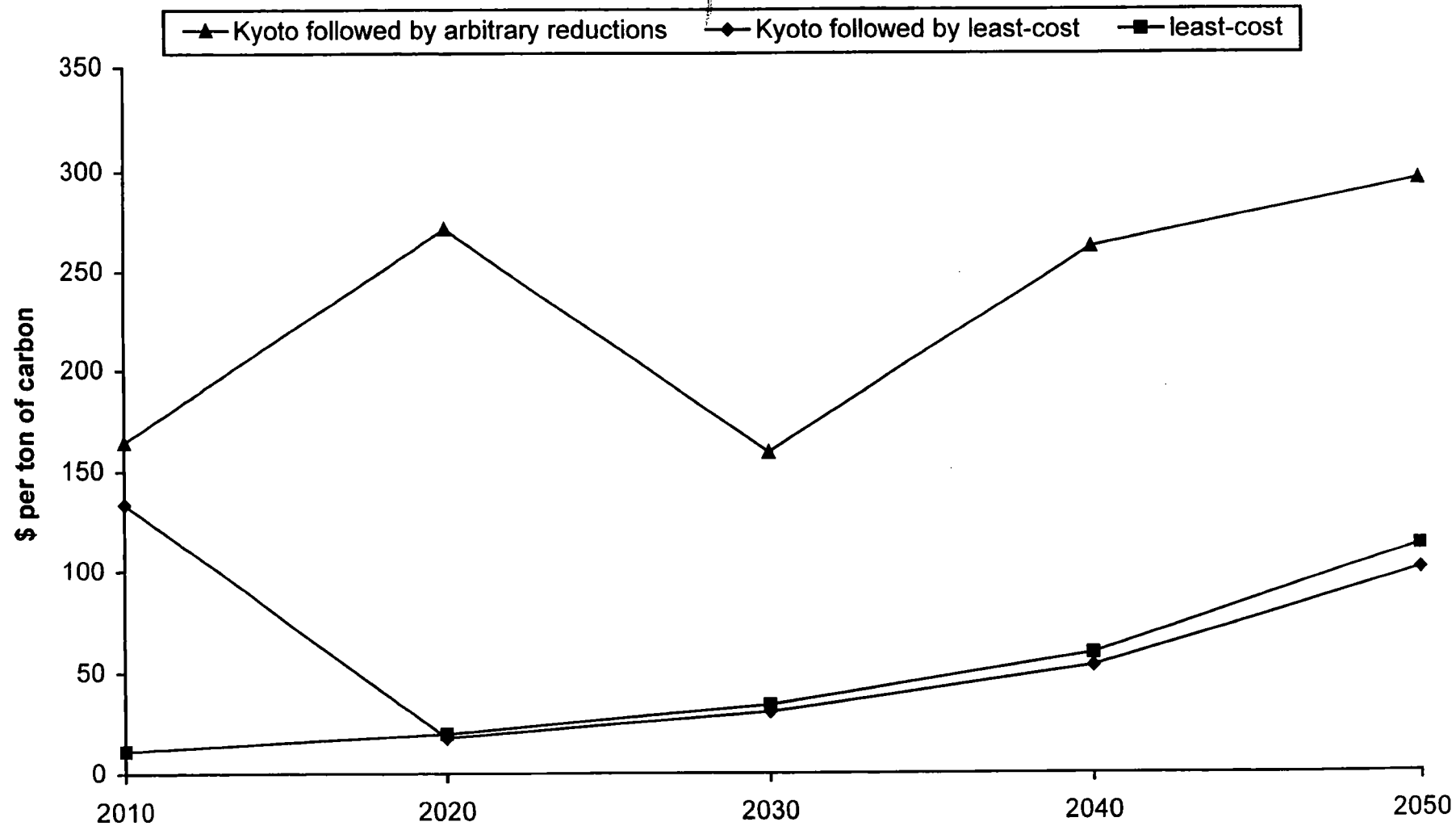


Figure 7.3 US GDP Losses Under Alternative 550ppmv Stabilization Scenarios

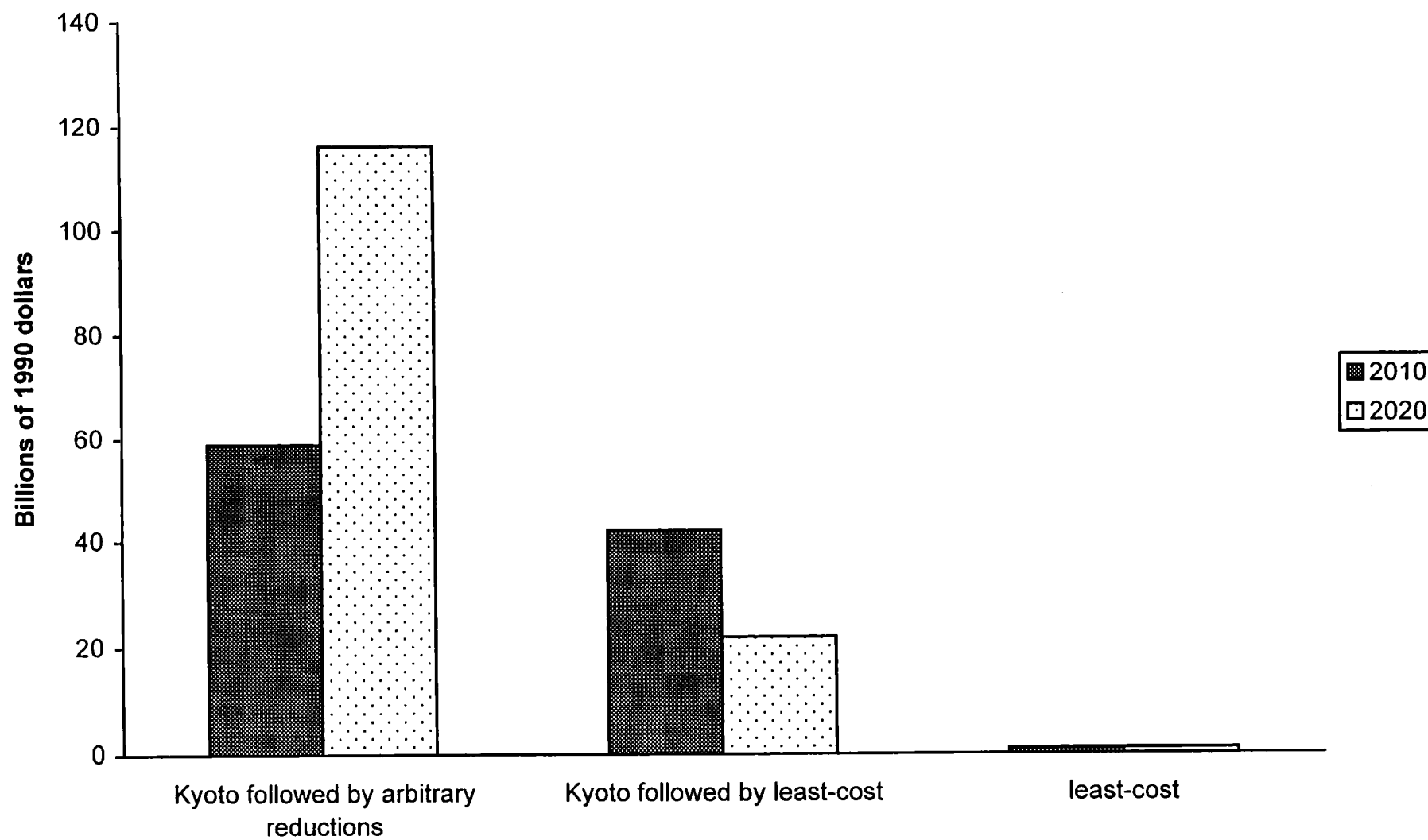
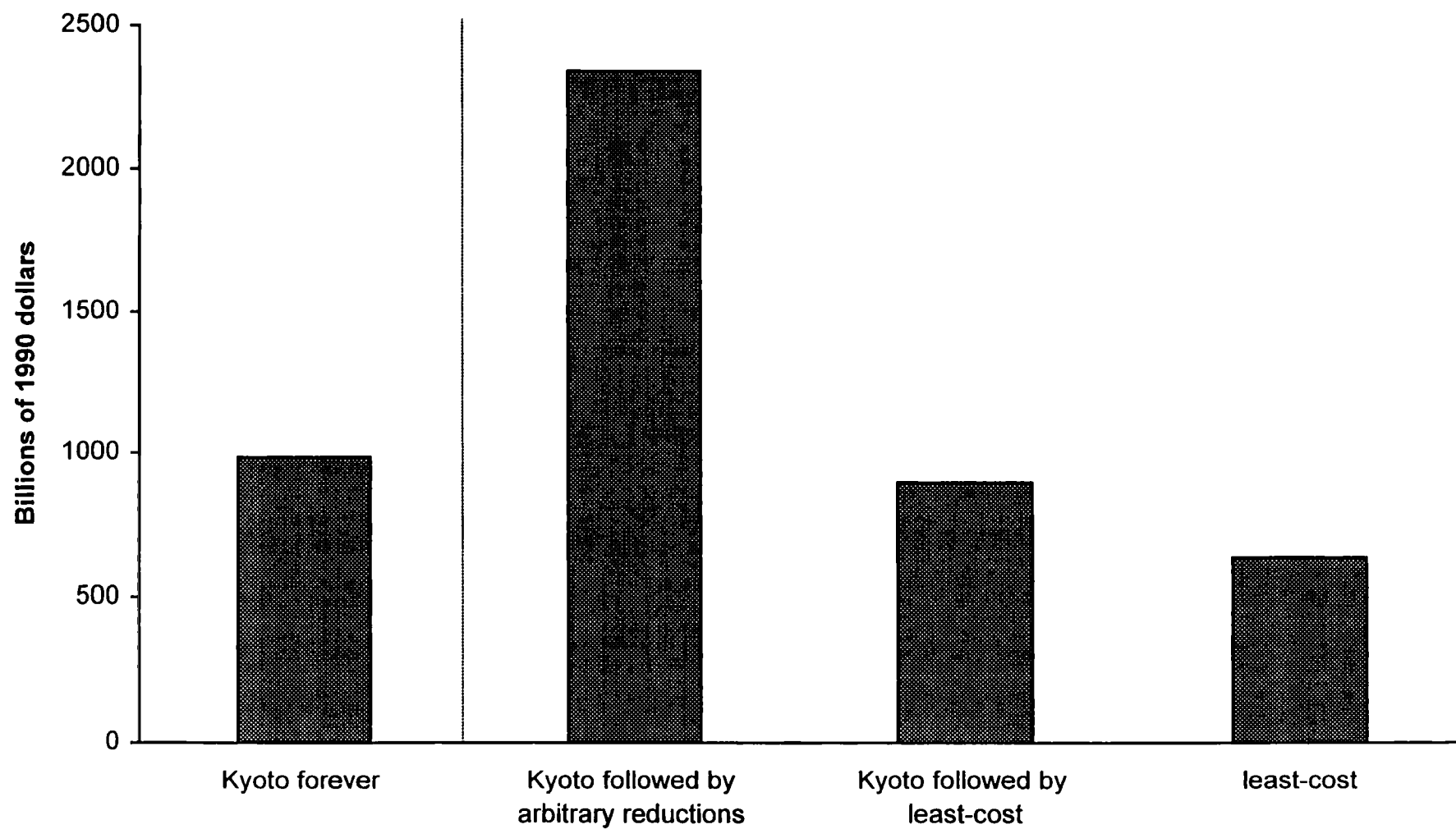


**Figure 7.4 Global Consumption Losses through 2100 Discounted to 1990 at 5% --
Kyoto Forever vs. Three Scenarios for Stabilizing Concentrations at 550ppmv**



improvement, but is still 40% more expensive than embarking on the most cost-effective mitigation pathway from the outset.

What is surprising is that “Kyoto Forever” turns out to be more expensive than “Kyoto followed by least cost” or “least cost”. “Kyoto Forever” results in sharper global emission reductions during the early decades of the 21st century. It does not, however, succeed in stabilizing emissions, much less concentrations. By contrast, the other scenarios all lead to stabilization at 550ppmv. In other words, “Kyoto Forever” ends up costing more, and it buys less long-term protection.

8. Further comments

Some suggest that models such as MERGE tend to *overestimate* the costs of mitigation. They argue that, when prospects for technical progress are incorporated, the costs of a carbon constraint, even a sharp near-term constraint, will be minimal. We, too, are optimistic about the outlook for technical innovation. Indeed, such innovation is embedded both in our reference case and in the policy scenarios. The disagreement is over the rate at which such progress will occur. We do not believe that economically competitive substitutes will become available at such a rate as to trivialize the costs of a Kyoto-like Protocol.

A more valid concern may be that we are *underestimating* the costs of a carbon constraint. There are several reasons why this may be the case. To begin with, optimization models assume that decision makers have perfect foresight. That is, they assume that investors are fully informed about the nature of future constraints, and act accordingly. Given the present state of uncertainty, this is highly unlikely. Models such as MERGE also tend to ignore short-term macro shocks. For example, the higher energy prices brought about by a carbon constraint are likely to be inflationary. If this leads to higher interest rates, investment may be dampened. The result would be a slowdown in economic growth.

In addition, we assume that policies will be efficient. That is, market mechanisms will be chosen over “command and control” approaches to accomplishing environmental objectives. Whereas, in recent years, there has been an increasing trend toward market mechanisms, the approach to be taken with climate policy is by no means assured. Moreover, even if such a commitment were made, we have no assurances that the requisite international institutions will be available when needed.

Although it is easy to quibble over the numbers, the real value of analyses lies more in insights than in numerical values. And, indeed we believe that the current exercise has yielded several insights that may be of value to those charged with interpreting the current proposal. Here, we summarize what we have learned:

- First, it is extremely unlikely that a “Kyoto Forever” scenario will stabilize emissions -- much less concentrations. Non-Annex 1 emissions are quickly overtaking those of the OECD and the economies in transition. Hence, meeting the stabilization goal of

the Framework Convention will eventually require the participation of developing countries.

- International cooperation through trade in emission rights is essential if we are to reduce mitigation costs. The magnitude of the savings will depend on several factors. These include the number of countries participating in the trading market, the shape of each country's marginal abatement cost curve, and the extent to which buyers can satisfy their obligation through the purchase of emission rights.
- With regard to the latter, limitations on the purchase of emission rights may be especially costly. In the example explored here, limiting purchases to one-third of a country's obligation increased GDP losses by a factor of at least two and one-half in the year 2010. If proponents of such limitations are successful, they may seriously reduce the benefits from "where" flexibility.
- The issue of monopoly power in markets for emission rights may turn out to be important. This is most likely to occur if trading is limited to Annex 1 and the majority of inexpensive emission rights are concentrated in a small number of countries. If these countries were successful in organizing a sellers' cartel, they might be able to extract sizable rents.
- The near-term costs of the Protocol will depend on expectations regarding the future. Energy investments are typically long-lived. Today's investment decisions are not only influenced by what happens during the next decade, but also by what happens thereafter. Hence, analyses which focus solely on 2010 may be underestimating the costs of Kyoto.
- Finally, and perhaps most importantly, unless the concentration target for CO₂ is well below 550ppmv, the Protocol appears to be inconsistent with a cost-effective long-term strategy for stabilizing CO₂ concentrations. Rather than requiring sharp near-term reductions, it appears that a more sensible strategy would be to make the transition at the point of capital stock turnover. This would eliminate the need for premature retirement of existing plant and equipment and would provide the time that is needed to develop low-cost, low-carbon substitutes.

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Appendix A. Modeling international trade in the energy-intensive sectors

MERGE 3.0 has recently been modified to include the possibility of trade in EIS (energy-intensive sectors). EIS is an aggregate including ferrous and non-ferrous metals, chemicals, nonmetallic minerals, paper, pulp and print. This aggregate does not include the energy-intensive industry of petroleum refining. The model may be run either with or without EIS trade.

The new feature is introduced in a way that preserves the basic simplifying characteristics of the ETA-MACRO submodel. That is, energy, capital and labor are substitutes that enter into an aggregate production function. They produce a numeraire good which may be used for consumption, investment and interindustry payments for energy costs.

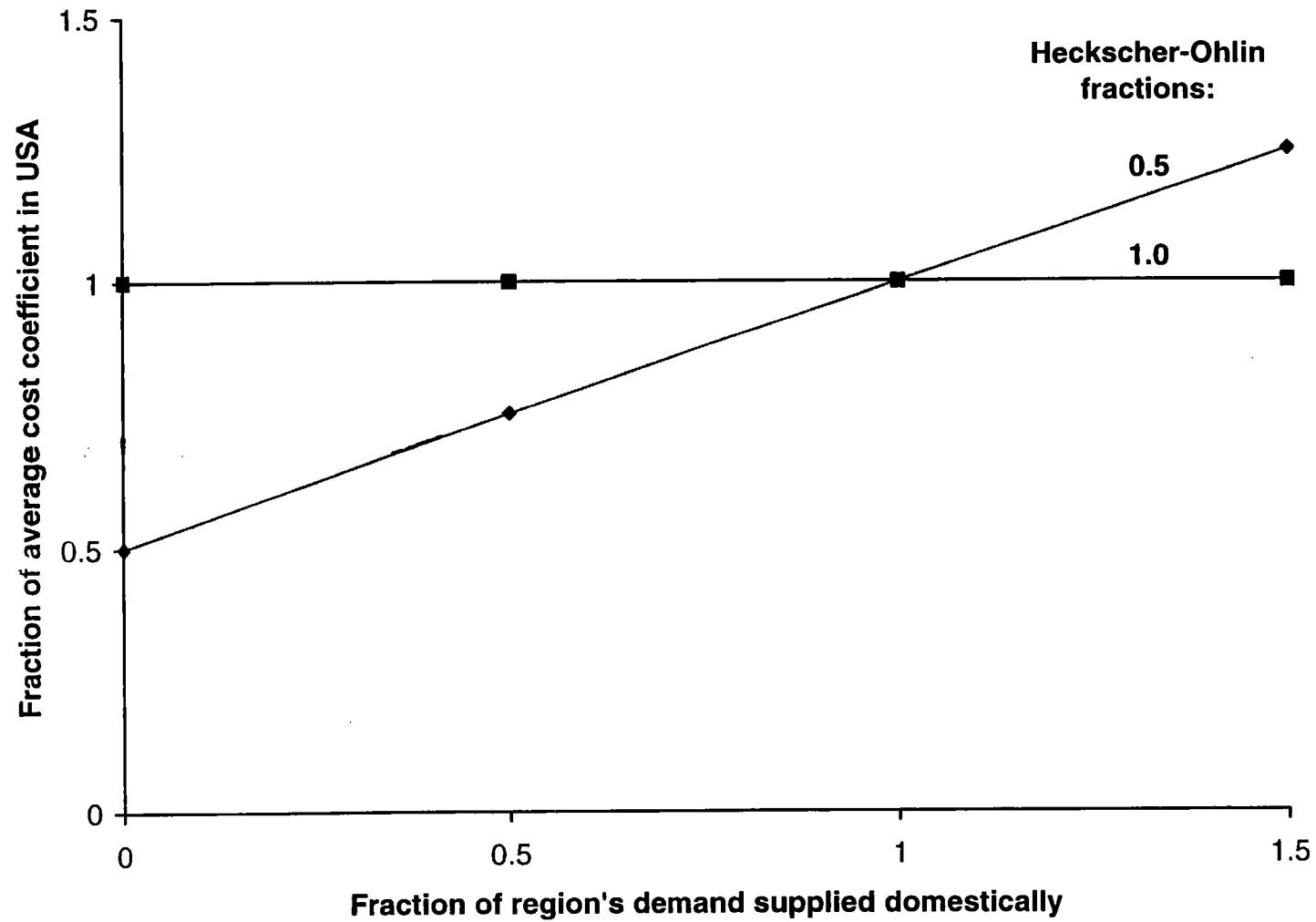
It is assumed that trade will continue to represent a relatively small amount of each region's total internal demand for EIS. The GTAP (General Trade Analysis Program, 1992) data base is employed to estimate each region's EIS demands. In all other respects, the model is the same as MERGE 3.0.

For projecting the impact of the Kyoto protocol, each region is taken to be self-sufficient at base year energy prices. Changes in the location of production are attributed primarily to changes in the cost of energy. At base year prices in the USA, 85% of the cost of EIS consisted of non-energy inputs (labor, shipping, capital, iron ore, etc.), and 15% of the cost consisted of energy inputs (half electric and half non-electric). Under these conditions, a doubling of energy prices would imply only a 15% increase in the cost of EIS. This is why it is assumed that the demand for EIS is inelastic with respect to the price of energy. For projecting future demands, the income elasticity is taken to be 0.5.

For modeling purposes, we have supposed that the marginal supplies of EIS in all regions are determined by the same international technology that prevails in the USA. Each region has the same energy-EIS production ratio. For non-energy inputs, each supply curve is linear. Its positive slope serves the same purpose as an Armington elasticity describing substitution between foreign and domestic goods. This is the way in which we avoid penny-switching as a characteristic solution mode.

The slope of the non-energy supply curve is described as a Heckscher-Ohlin fraction. If this fraction is unity, EIS is viewed as a perfectly homogeneous commodity. Small changes in energy costs will then lead to large changes in the international location of production. If this fraction is less than unity, the supply function is less elastic, and the changes in location will be less dramatic. (See Figure A.1.)

**Figure A.1 EIS Supply Curves --
Marginal Cost of Non-Energy Inputs to EIS**





U.S. Agency for International Development
Washington, D.C. 20523

FACSIMILE TRANSMITTAL COVER SHEET

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DATE: AUGUST 18, 1998

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U.S. AGENCY FOR
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DEVELOPMENT

AUG 18 1998

TO: Dan Reifsnyder, State
Maurice LeFranc, EPA
Debby Stowell, DOE
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Jane Leggett, EPA
Jeffrey Frankel, CEA

FROM: Jeff Seabright, G/ENV/EET

Attached is a revised draft issues paper on a possible Clean Development Mechanism (CDM) registry proposal for COP-4, as discussed at the CDM meeting at EPA on July 30. Please share comments by COB Friday, August 21st and I will circulate a revised draft for the next CDM inter-agency meeting.

cc: DHales, DAA/G/ENV
Ckoppell, G/ENV/EET

The CDM Registry: Jump Starting the Clean Development Mechanism

Issue: The US should press for a non-binding resolution at COP-4 which would state the political intent of the Parties to retroactively credit valid Clean Development Mechanism projects from the year 2000 if such projects meet the criteria eventually established by the COP/MOP or CDM Executive Board. To help operationalize this intent, should a "Registry" be created at the UNFCCC Secretariat to document candidate CDM projects and opportunities?

Introduction and Background

The Clean Development Mechanism, defined in Article 12 of the Kyoto Protocol, allows certified emission reductions from project activities to accrue beginning in the year 2000. However, the necessary institutional infrastructure, rules and guidelines to govern a CDM crediting system will not be in place by 2000 and it could be several years beyond then before the COP/MOP decides on the mechanics of the system. Adopting a non-binding resolution at COP-4 and establishing a CDM Registry is one way of encourage early action.

The Registry is based on the premise that *early action* generates economic and environmental benefits. Early action enables a smoother, and less costly, transition to lower national emissions levels commensurate with Kyoto commitments. However, because of future regulatory uncertainty the current market will not promote strong early action. In order to act, the private sector needs reasonable expectations of investment returns. The Registry could overcome this barrier and promote CDM projects by boosting expectations that projects will be retroactively credited.

The US has experience with registries in other, analogous regulatory contexts in which there is a similar intent to document and recognize early action. Section 1605(b) of the Energy Policy Act of 1992, administered by the Energy Information Administration (EIA/DOE), establishes a means for US firms to voluntarily report greenhouse gas emissions reductions. The program allows firms to (1) report annual GHG emissions, for the purposes of recording a baseline from which to measure future actions, and (2) record specific GHG emissions-reducing and carbon sequestering projects, at both the domestic and international levels.

Documenting action under Section 1605(b) is simple and straightforward. Guidelines and forms are provided for a wide range of project activities that include, inter alia, electricity generation, cogeneration, energy end use, transportation and carbon sequestration. Several measures exist to ensure the accuracy of reported emissions including a third party certification requirement, self-assessments, clear guidelines and procedures, and a review process.

Climate Wise, USJI, and other government programs are vehicles for early action and voluntary reporting. A condition of participating in Climate Wise is annual reporting of GHG emissions through Section 1605(b). One driver of participation in the Climate Wise program and documenting GHG emissions through Section 1605(b) is to help insure fair treatment under future climate policies, such as a domestic emissions trading system. By documenting early action, companies can strategically position themselves and reasonably anticipate reduction

credit. The same rationale exists for creating a CDM Registry. Once COP/MOP decisions have been made enabling the CDM to become operational, information about what projects have already taken place will help insure that appropriate emissions reduction activities are recognized (beginning in 2000), in the form of certified emission reductions (CER).

The CDM Registry

A CDM Registry would document and facilitate early CDM action, as well as serve as a "bulletin board" -- a clearinghouse of potential CDM projects that matches host country needs and investor specializations. The Registry would be UNFCCC Secretariat-based and include information on project proposals and investments that expect to be credited by the CDM, once the mechanism becomes operational. The Registry would complement and help actualize a non-binding resolution or statement of intent to retroactively certify acceptable projects.

The Registry is intended to be value free and non-prejudicial -- in no way will projects posted on the Registry be guaranteed retroactive credit. The only "guarantee" is that the CDM Executive Board will eventually review projects that are operationalized through the Registry (i.e. projects registered will be *considered* for crediting). Whether the project generates certified emission reductions (CERs) is a decision of the Executive Board or other UNFCCC body, and a function of the relevant baselines, monitoring provisions, additionality criteria, etc. that the COP/MOP eventually agrees to. This is analogous to Section 1605(b) in the US, where the review process is undertaken by the US government. Whether credit is eventually retroactively granted under 1605(b) will depend on, inter alia, the nature of the regulatory system adopted and the magnitude, robustness and credibility of emissions reported.

CDM Registry would add value for investors, hosts and the process itself:

Investors. Candidate CDM projects that have already been agreed to between investor and host country could be posted on the Registry for documentation and information sharing purposes. In addition, Annex I private sector entities could use the Registry to post projects that they are interested in financing. For example, a company specializing in photovoltaics or combined-cycle gas turbines could "advertise" their services in a CDM context.

Hosts. Non-Annex I entities (government agencies or private sector) could use the Registry to solicit sponsors for a project, or set of projects, that the host has identified as potentially CDM eligible and consistent with national sustainable development objectives. Thus, the Registry would be an enabling mechanism for Article 12.4 of the Convention, which states that "Developing country Parties may, on a voluntary basis, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be needed to implement such projects, along with, if possible, an estimate of all incremental costs, of the reductions of emissions and incremental removal of greenhouse gases, as well as an estimate of the consequent benefits."

Process. By detailing projects that expect to earn credit, a CDM Registry would contribute to the growing body of experience on many of the difficult methodological issues -- such as baseline construction, additionality, leakage, monitoring, etc. -- which CDM rules and

procedures will address. If methodologies used by project developers are subsequently deemed unacceptable by the COP/MOP or Executive Board, emission reductions could be recalculated and verified *ex post*, for crediting purposes, using agreed upon methods.

The information posted on the Registry would be chosen at the discretion of the Parties or entities posting. Unlike Section 1605(b), there would not be required categories of information that project proponents or hosts would need to provide. The Registry would employ an easy-to-use interface (perhaps with a web-based option) and be accessible and available to any Party or domestic entity.

Pro:

Cultivate private sector interest. The private sector is showing strong interest in emissions reduction projects overseas. This interest is largely motivated by a return on investments that includes CERs -- an asset useful in demonstrating compliance in a domestic and/or international regulatory system. If COP-4 fails to make any progress on the CDM, the US business constituency's interest and support for the Kyoto Protocol could wane. A disillusioned private sector may lead to negative repercussions in the domestic political arena and discourage project initiation. In short, the private sector is ready, but international politics are not. The Registry may help balance this disjunction, and maintain some "Kyoto momentum."

Engage Developing Countries. In addition to Annex 1 private sector entities, constituencies in some developing countries already support early action. Gylvan Meira (at the Aspen CDM workshop in Sao Paulo) proposed a non-binding COP-4 resolution for retroactive crediting. Other developing country delegations could also be amenable to such a proposal, and should be engaged as early as possible to preclude concerted G77/China opposition. Because it is broad in scope, treating the needs and interests of all Parties, the Registry should garner considerable support from developing countries. Countries wary of unbridled CDM investment within their borders should be comforted, rather than intimidated, by an approach that gives them discretion and oversight over projects. Similarly, for countries fearing that the CDM -- like AIJ -- will overlook them, the Registry gives them an opportunity use the CDM as a vehicle to proactively promote their investment and development needs.

Kyoto Compliance. CERs generated by US entities between 2000 and 2012 will be added to the US assigned amount. An effective CDM, which generates CERs throughout the pre-budget period, will reduce compliance costs and domestic actions needed to comply with Article 3/Annex B commitments. The Registry would facilitate the crediting of emission reductions during the years before the CDM becomes officially operational (in 2000 and 2001, for example).

Environmental Benefits. Because of long atmospheric residency lives, GHGs emitted today will contribute to higher atmospheric concentrations in future decades. Without crediting provisions, or reasonable expectations of crediting, it is unlikely that GHG-reducing projects will be initiated en masse. The Registry would boost investor confidence and expectations in the system and therefore stimulate CDM investments. In addition, because the Registry facilitates the actual *initiation* of projects, helping to match project hosts and investors, transaction costs will be

lowered and more potential CDM flows will be generated.

Incremental Learning. This is one of the explicit functions of the CDM Registry. The Registry would contribute to the growing body of experience on yet to be determined methodological issues -- such as baseline construction, additionality, leakage, monitoring, etc.

Maintain the Kyoto momentum. Unlike Article 6 JI or Article 17 emissions trading, CDM negotiations entail some degree of urgency. The banking provision (Article 12.10) requires the CDM to be operational before the first budget period begins. Unless measures are taken at COP-4, the Parties will not be able to express their views on CDM crediting until COP-5, which will take place just a few months before the Protocol allows credits to be obtained.

Con:

Designing the Registry. Problems designing the Registry will be a function of the detail and information requested. If the Registry consists of a detailed set of questions, analogous to Section 1605(b), the issue of *who* designs the Registry, and *what* exactly the Registry consists of, will become highly contentious and politicized.

Therefore, design if the Registry should not presuppose a certain institutional structure or other CDM rules and modalities. To prevent design of the Registry from becoming a *de facto* design of the CDM itself, proponents should insist that specific information (such as additionality, monitoring, sustainable development benefits, etc.) not be *required* in the Registry. *The information offered is provided at the discretion of the registrant.*

Overstating Reductions. Section 1605(b) utilizes several measures that help ensure accurate reporting. These include standardized reports; a report review and assistance process; certification of data accuracy; criminal penalties for falsifying data; and a self-assessment of data accuracy conducted by the reporter. Agreement among Parties on similar measures for the Registry may not be possible at COP-4, nor are they necessarily appropriate or desirable. Without such measures however, CDM project developers and hosts may attempt to use unsanctioned methodologies to inflate emissions reduction estimates for the purposes of obtaining credit. The Registry would be unable to exclude certain methodologies and practices, which may become standard practice.

This potential problem can be eased by clearly stipulating that the "auditing" and "review process" (analogous to 1605(b)) are the functions of the yet to be formed Executive Board or other COP/ Secretariat-related body. If project developers anticipate a rigorous review process for obtaining CERs, the incentive should actually be to report as accurately as possible, because sloppy projects with weak monitoring and reporting may be denied CERs. *Thus, ideally, forward-thinking project developers will self-initiate third party verification, conservative estimation methodologies, etc. to strengthen their case for generating CERs retroactively.*

Developing country opposition. If not presented carefully, the Registry could become a "straw man" for some developing country delegations and harm the negotiating environment for the CDM and other issues at COP-4. In terms of operationalizing the CDM, developing countries' main priority is that CDM rules "should be determined on the basis of equity, sustainable

development and the other principles of the Convention" (FCCC/SB/1998/MISC.1/ Add.3). A G77/China position paper also states that studying methodological issues should be a first step (FCCC/SB/1998/MISC.1/Add.5), and this should take place under the full authority of the COP or other official bodies. Some developing countries may feel that the Registry -- which is geared toward documentation for the purpose of retroactive crediting -- runs counter to stated G77/China priorities. Registry "design" and the potential to overstate reductions, both discussed above, could also elicit developing country reticence.

These problems can be mitigated by enlisting the support of key developing countries before COP-4 and proposing the Registry as a joint initiative between several Annex 1 and non-Annex 1 Parties that cut across negotiating blocs. In addition, some countries may simply wish to retard the development of the CDM in any way possible. General anti-CDM sentiment does not constitute a legitimate argument against a Registry, and is not consistent with what has already been agreed to in the Kyoto Protocol.

Conclusion

A CDM Registry offers numerous benefits, as discussed above. The three drawbacks discussed -- designing the Registry, overstating reductions and developing country opposition -- are tractable problems which a carefully proposed Registry will overcome.

Overall, the Registry performs three important functions:

"Registering" projects, thereby insuring they will be *reviewed* by the Executive Board and *considered* (although not guaranteed) for CERs. This will also serve as a key "signal of intent" from regulators, boosting private sector confidence in the CDM and bringing domestic political benefits.

Serving as a "bulletin board," or clearinghouse, to match the project needs of hosts and investment desires of project developers. Thus, the Registry lowers transaction costs, thereby promoting CDM projects that transfer technology and reducing GHGs.

Providing a formal "space" for information gathering and learning for estimation methodologies, additionality criteria, verification, monitoring, baseline formulation, etc.

Insuring that the statement of intent and the CDM Registry are agreeable to all Parties at COP-4 will depend on enlisting the support of key developing countries before COP-4 and packaging the Registry as a non-confrontational and non-institutional entity that will not pre-judge future COP/MOP/EB decisions.



MEMBER

EXECUTIVE OFFICE OF THE PRESIDENT
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON, D.C. 20500

August 11, 1998

cc: SP
HS
JA
QF

Dear Tom:

At our "breakout session" in Aspen in July, I promised that if anyone gave me a list of specific things that the Federal government could do to increase the efficiency of the electric power sector, simultaneously saving money and reducing emissions, I would try to look into them. To my surprise, you actually produced such a list, from your forthcoming book. I am writing you now in response to your list of proposals, which I found extremely useful.

From our viewpoint, your items break down into five categories:

- Those that we clearly agree with, and believe are already addressed by the Administration's recently proposed legislation on electricity restructuring. These include changes in the traditional regulation of monopolies through rate-setting limits and changes in interconnection rules (your items 1 and 4). As you know, the Administration bill encourages States to implement retail competition through a flexible mandate (Section 101) and also provides for federal interconnection standards to be established by the Federal Energy Regulatory Commission (Section 303). The Department of Energy (DOE) informs me that the interconnection provision was included in response to concerns expressed by Trigen and others that existing interconnection standards set by many states are discriminatory and have the effect of discouraging the construction of otherwise economic and environmentally benign electricity generation.
- Those that we think are addressed in part by the Administration's support for retail competition, but that warrant further review (items 2, 3, 5-8). In many cases, states have adopted regulatory policies that have the effect of discouraging increased efficiency. In talking with Dan Adamson (DOE Staff), I understand that DOE intends to consider these items internally with the purpose of coming up with a set of recommendations for Administration policy in this area. Dan informs me that he expects to start work shortly on this matter. We intend to work closely with them. For items 6-8, it sounds like there might be a potential role for federal anti-trust enforcement. Price discounts to certain customers, volume discounts, or exclusive deals, are not *per se* illegal. Such pricing practices may violate anti-trust statutes if it can be shown that substantial competition is foreclosed or that the firm is engaged in predatory pricing, which are judged on a case-by-case basis. However, such actions are often immune from anti-trust challenge because they are approved by state regulators.

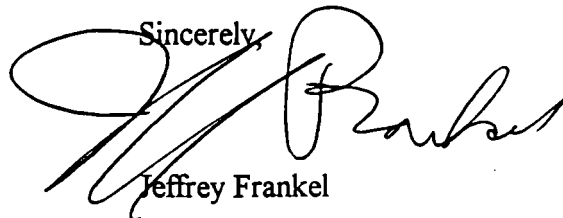
- Those dealing with the Clean Air Act (items 9-11). Your arguments make a lot of sense to an economist. A simple response would be that addressing these issues would require new legislation, which is not a likely prospect. But I want to investigate more (with EPA) whether there are any good arguments on the other side and, if not, whether there is any hope for getting something done along the lines you suggest, particularly in the area of discretionary policy (your item 11).
- Those that are primarily state and local issues for which we see a limited federal role. For construction of new transmission and distribution facilities (item 3), it is local zoning laws, in addition to state and federal environmental laws, that are relevant.
- Those regarding the management of federal facilities. Some efforts along these lines are already under way. The President's radio address of 7/25 discussed retrofitting federal buildings with energy efficient technology, replacing conventional light bulbs with fluorescent lights, achieving Energy Star efficiency standards, and adopting sustainable design guidelines. Executive Order 12902 (March 1994) establishes energy efficiency goals for agencies. Further, Public Law 104-52 (November 19, 1995) gives each agency, except DOD, 50% of the amount of utility rebates for energy efficiency, and measured energy savings from energy-saving performance contracts, to be used for further energy efficiency projects.

I am still looking into several aspects of these issues. We may run into countervailing arguments. But the goals of increasing environmental/economic efficiency in the electricity sector are so important, and your ideas personally are so highly valued in the White House, that I want to try to pursue them as far as I can.

Your manuscript says "do not circulate." I have already taken the liberty of consulting with some staff economists. Do you have any objections to my circulating those pages a bit more widely within the government?

Thank you for the opportunity to see your proposals.

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffrey Frankel", written over the word "Sincerely,".

Jeffrey Frankel

Mr. Thomas Casten
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Cyril
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Options for Responsibility for Non-Compliance Under Kyoto Protocol Emissions Trading

The Kyoto Protocol permits Annex B countries to transfer parts of their assigned amounts to other Annex B countries (Art. 17). An important question is who has ultimate responsibility, the buyer (transferee) or seller (transferor) if the seller has exceeded its assigned amount at the end of the commitment period. This paper identifies several options for assigning responsibility and discusses their pros and cons. It should be noted that the options are not all mutually exclusive, and an optimum responsibility rule might blend several of the approaches discussed below.

PURE SELLER RESPONSIBILITY

Countries can sell an unlimited amount of emission reduction units. The compliance of the seller country is only subject to evaluation at the end of the commitment period. Even if it is found that the seller is out of compliance, the buyer country can use the emission units it has purchased to meet its obligations. Pure seller responsibility relies solely on the relationship between the selling country and the treaty regime to ensure compliance.

Pro

- Simple to administer, since it requires straightforward compliance determination at end of commitment period.
- Stimulates market by eliminating risk to buyer.
- Seller is in best position to determine its own level of implementation and ability to sell.
- All allowances are equal in secondary market.

Con

- The financial benefits received by the seller country for fraudulent emission reduction units may outweigh the consequences of non-compliance.
- The buyer has no incentive to investigate whether or not the seller is experiencing implementation problems because their emission reduction units are guaranteed.
- May place responsibility on Parties with weak economies or limited administrative and enforcement capacity.

SELLER RESPONSIBILITY WITH ESCROW

Seller could be required to escrow some or all of the purchase money until compliance has been determined at the end of the commitment period.

Pro

- Provides ready cash to purchase needed allowances at end of commitment period.

Con

- Seller may need to use purchase money to achieve implementation.
- Does not guarantee allowances will be available for purchase at end of commitment period (note: if allowances are borrowed from subsequent commitment period, Parties may compensate by adopting less stringent targets for that subsequent period).

BUYER RESPONSIBILITY - UNIFORM DISCOUNTING

If at the end of the commitment period, the seller country is found to be out of compliance, all of the emission reduction units that it has sold will be equally discounted to make up overage.

Pro

- Encourages buyer due diligence (investigation of seller).
- The buyer pressures the seller country to implement policies and measure in order to avoid compliance questions.
- Probably places responsibility on stronger Party.
- Unlike LIFO and traffic light approaches (see below), does not encourage early buying rather than reducing domestically.
- All reduction units sold can be discounted to cover seller's "overage."

Con

- With respect to Protocol compliance mechanism, seller is off the hook.
- Does not discriminate between a buyer who exercised due diligence when investigating the seller country and another buyer who purchased emission reduction units when implementation problems were apparent.
- Could reward buyers of bad units by spreading discount across all buyers.
- May inhibit the development of a robust and efficient market if buyers are wary of trusting the seller countries.
- Unnecessary transaction costs may accrue because each buyer country duplicates the evaluation of the seller country.
- Allowances are rated, hence not equal in secondary market.

BUYER RESPONSIBILITY - "LAST-IN, FIRST-OUT"

Under "last-in, first-out" (LIFO) buyer responsibility, the emission reduction units that were sold last are the first to be returned until the amount of units sold reflects the reductions achieved by the seller country. Vintaging of the emission units is necessary to ascertain the order in which they were purchased.

Pro

- Again, the seller must prove that the emission units sold will be equal to the reductions achieved, in order for the buyer to pay the premium price.
- Rewards due diligence of buyer.
- All reduction units sold can be returned to seller to cover "overage."

Con

- Creates incentive to buy emission reduction units early, which may encourage unnecessary buying and discourage domestic action.
- Due diligence does not protect buyer against subsequent excess domestic emissions by seller.
- All allowances not equal in secondary market.

BUYER RESPONSIBILITY WITH INSURANCE

Buyer could be required to purchase insurance to cover possible non-compliance by seller. Insurer would provide required number of allowances or cash equivalent.

Pro

- Could create a reserve of allowances held by insurers to protect against possible seller non-compliance.
- Compliance "true-up" would be automatic.

Con

- Adds transaction cost for buyer (cost of insurance).
- Insurance reserve would soak up some allowances that would otherwise be available to Parties, thereby further increasing difficulty or cost of compliance. However, these may be one-time costs since reserve need be replenished only if used.
- Reliance on private entity insurers may be risky.
- If insurers pay off in cash, there is no guarantee excess allowances will be available to cover overage at end of commitment period.

JOINT BUYER-SELLER RESPONSIBILITY - UNDIFFERENTIATED

After the seller country is found to be in non-compliance, the seller and the buyer must participate in negotiation to assign who should take responsibility. Each Party would be uncertain as to how much risk is associated with the transaction.

Pro

- Can seek remedy from either party or both parties to transaction.

Con

- Ultimate responsibility may be unclear and require negotiation.
- May lead to finger-pointing and delayed resolution of problem.
- No guarantee excess allowances will be available to cover overage at end of commitment period.

JOINT BUYER-SELLER RESPONSIBILITY - DIFFERENTIATED

At end of commitment period, initially, seller is responsible for overage. If seller does not remedy within a certain period of time, responsibility shifts to buyer.

Pro

- Seller may be more likely to comply if it retains some responsibility to COP.

Con

- May make buyers less wary.
- Could delay remedy, since buyer must wait to see if seller remedies.
- No guarantee excess allowances will be available to cover overage at end of commitment period.

BUYER-SELLER HYBRID (TRAFFIC LIGHT)

At the beginning of the commitment period, all countries have a green light to trade emission reduction units. Units traded under the green light are guaranteed to the buyer (seller responsibility). However, if

implementation problems occur, the country must sell under a yellow light (buyer responsibility). The yellow light units will be subject to discounting or LIFO if the seller is in non-compliance at the end of the commitment period. If the implementation problems are not resolved, the red light is switched on and the seller is prohibited from further selling. If, however, the problems are fixed, seller can return to the green light status.

Pro

- Stimulates market by offering buyers "solid gold" (green) reduction units.
- Provides strong incentive to avoid "yellow" reduction units.
- Quick and thorough examination of the sellers by review teams to provide accurate information to the market.
- Highly transparent, since all information developed by review teams would be public.
- Measuring performance against milestones or "burn rates" would provide strong incentive for mid-course corrections.

Con

- Triggering of yellow light by review teams could be politically difficult, and lag time could be excessive. These problems might be avoided by having yellow light be triggered by annual inventories, measured against agreed milestones or burn rates.
- Could provide disincentive to achieve early domestic reductions.

EMISSION REDUCTION RESERVE - NATIONAL

Strictly speaking, not a responsibility option, but a mechanism for ensuring that non-compliance can be remedied. Could work under either buyer or seller responsibility. For each unit traded, one unit must be held in reserve by the selling country. This reserve would be used to cover the selling Party's overage. Any units not needed for this purpose could be sold to other Parties or banked.

Pro

- This mechanism would help ensure that reduction units are available to cover excess emissions, without having to "borrow" from the subsequent budget period.

Con

- Some Parties might regard this as an excessive constraint on trading.
- This approach will not eliminate hot air (see below).

EMISSION REDUCTION RESERVE - INTERNATIONAL

A percentage of each trade would be put into an international reserve. Presumably, this percentage would be smaller than 1 for 1 (e.g. 5-25% of trade). At end of commitment period, reserve would sell units to Parties that are out of compliance. Proceeds could be given to the GEF to finance additional reductions in non-Annex I countries.

Pro

- Would help ensure that reduction units are available to cover excess emissions without having to "borrow" from the subsequent budget period.
- Would offset hot air by obtaining additional reductions through GEF.
- Increase level of domestic reductions by raising cost of international trades.

Con

- Some countries may object to creation of a new international fund.
- May raise WTO issues (but other responsibility mechanisms may also).
- May inhibit development of international trading market.

-- DRAFT --

For Comment Only

Please contact the author with comments and suggestions

**International Emissions Trading and Compliance with
Greenhouse Gas Emissions Limitation Commitments**

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May 1998

SUMMARY

The Kyoto Protocol provides for transfers of "assigned amount" (international emissions trading) among Annex I Parties. The rules for international emissions trading are expected to be adopted by the Conference of the Parties in November 1998.

Purchasers will want to buy "assigned amount" prior to the end of 2012 so that it can be used to help meet their commitments for the 2008-2012 period.

Although Annex I Parties report their emissions annually, actual emissions for the period 2008-2012 will not be known until some time after the end of the period, probably 2014. Thus neither the buyer nor the seller can be certain that the "assigned amount" purchased will be surplus to the seller's compliance requirements at the time of the transaction.

Making sellers responsible for the validity of the "assigned amount" sold simplifies the administration but possibly at the price of increased non-compliance. Holding the proceeds in escrow until compliance is established provides an incentive to comply although with some increase in complexity.

Making buyers responsible for the validity of the "assigned amounts" purchased provides an incentive to comply and hence increases the integrity of emissions trading. If necessary, proposed sales would be disallowed working back in time from the most recent sale until the seller achieves compliance. All earlier transactions are completed.

Buyers will want insurance coverage or a performance bond to ensure that disallowed transactions do not cause them to violate their commitments. The insurance coverage or performance bond must replace the "assigned amount" from a disallowed sale with valid "assigned amount" or equivalent instruments.

A central estimate of the value of "assigned amount" transferred is \$8 billion per year. Coverage would be required for up to seven years, so total exposure for the industry could be up to \$56 billion.

The requirement for insurance or performance bonds exists only if the rules for international emissions trading specify that the buyer is liable for the validity of the "assigned amount" purchased and this is likely to be decided in November 1998.

BACKGROUND

Kyoto Protocol sets out emissions limitation commitments for developed countries (Annex I Parties) for a basket of six greenhouse gases for the period 2008-2012. To help them meet their commitments, the Kyoto Protocol allows transfers of "assigned amount" among Annex I Parties. This is called international emissions trading.

The rules for international emissions trading will be adopted by the Conference of the Parties, probably at COP 4 in November 1998.

Purchasers will want to buy "assigned amount" prior to the end of 2012 so they can use this additional "assigned amount" to help them meet their commitments for the 2008-2012 period.

All Annex I Parties report their emissions annually. But actual emissions for the period 2008-2012 will not be known until after the end of the period, probably 2014. This means that neither the buyer nor the seller can be certain that the "assigned amount" purchased will be surplus to the seller's compliance requirements at the time of the transaction.

Thus the rules for international emissions trading must deal with situations where a buyer has purchased "assigned amount" from a seller that does not meet its emissions limitation commitments. There are two basic options: the seller or the buyer is responsible for the validity of the assigned amount.

SELLER RESPONSIBILITY

If the seller is responsible, the buyer can use the "assigned amount" to help meet its commitments regardless of whether the seller achieves compliance. If the seller meets its commitments, the trade does not create any problems. If the seller does not meet its commitments, the seller incurs the penalties for non-compliance. Administratively making the seller accountable is simple because transactions are final.

A system of seller responsibility relies on the penalties for non-compliance to ensure that they do not sell more than their surplus "assigned amounts". Emissions trading gives "assigned amount" a market value and so creates an incentive that does not exist otherwise to sell "assigned amount". Since the penalties for non-compliance in international agreements are typically quite weak and/or difficult to enforce, the financial incentive to sell may exceed the expected penalty for non-compliance.

A financial incentive to comply can be created by requiring that the proceeds from sales of "assigned amounts" be held in escrow until compliance is established. If all of the "assigned amount" sold is found to be surplus when compliance for the commitment period is established, the funds are disbursed to the country. If some of the "assigned amount" sold is needed to achieve compliance, the quantities not owned by the national government are reduced proportionally and the owners receive a share of the funds in the escrow account.

Holding the proceeds in escrow creates a financial incentive for sellers to meet their commitments. However, buyers planning to use purchased "assigned amount" to achieve compliance might find themselves in non-compliance because the amounts they purchased had been reduced. However, the rules could allow buyers a few extra months to purchase additional "assigned amount" or equivalent instruments to come into compliance.

Operation of the escrow accounts is discussed in the next section.

Escrow Accounts

An escrow account is established for each Annex I Party at a suitable financial institution; for example, the International Monetary Fund, the Bank of England or a commercial bank.¹ A condition of registration of the transfer of "assigned amount" by the Climate Change Secretariat would be documentation that the proceeds had been deposited into the escrow account. Interest would be paid on account balances. Funds would be disbursed once compliance for the commitment period is established.

In principle sellers receive no money from the sale of "assigned amount" until after the end of the commitment period when compliance is established. In practice sellers could borrow from other financial institutions using the escrow account balance as security.² Lenders would probably be willing to advance only a small share of the balance initially because future emissions and sales could cause non-compliance.³ But the share could rise over the course of the commitment period as actual emissions are reported and the prospects for compliance become clearer.

"Assigned amount" could be resold. The proceeds from a resale go to the seller (which is not the original Annex I Party seller), not into the escrow account. Only the proceeds from the original sale go into the escrow account.

Annual reports of actual emissions and information on sales and purchases of "assigned amount" provide potential buyers and lenders with information on the prospects for compliance. Since the prospects differ from country to country and over time, the market price of "assigned amount" would differ by country of origin and fluctuate over time. Annual reports submitted on time and well received by the expert review teams will strengthen the market price for a country's "assigned amount".

A country will want to keep the market price for its "assigned amount" as high as possible because this will affect the revenue it receives from future sales. Since compliance with reporting and other commitments strengthens the market price for a Party's "assigned amount" sellers have an incentive to comply with their Protocol commitments.

When compliance is established after the end of the commitment period the funds in the escrow account are disbursed. If all of the "assigned amount" sold is found to be surplus to the Party's needs, the funds are disbursed to the secured lenders and the national government.

If some of the "assigned amount" sold is needed to achieve compliance, the quantities not owned by the national government are reduced proportionally. For example, if when establishing compliance it is determined that a Party has a surplus of 800,000 tonnes of "assigned amount" and it has sold 1,000,000 tonnes, each of the units sold is reduced to 0.8 tonne of "assigned amount".⁴ This brings the seller Party into compliance.

As compensation for the reduction in their holdings of "assigned amount" the owners of record on the specified date receive a share of the funds in the escrow account.⁵ The compensation could be the greater of: (1) a proportional share of the funds in the escrow account, and (2) the cost of purchasing an equivalent quantity of valid "assigned amount" on the market. In the case of the above example, it would be the greater of 20% of the balance of the escrow account and the cost of purchasing 200,000 tonnes of valid "assigned amount".

Owners of devalued "assigned amount" would have first call on the funds in the escrow account. Secured lenders would rank second. The balance would be paid to the national government.

Buyers planning to use purchased "assigned amount" to achieve compliance might find themselves in non-compliance because the amounts they purchased had been reduced. The rules could be drafted to allow buyers a few extra months to purchase additional "assigned amount" or equivalent instruments to come into compliance.

BUYER RESPONSIBILITY

If the buyer is responsible, it must decide whether the seller is likely to comply with its commitments before purchasing the "assigned amount". If the buyer agrees to purchase "assigned amount" and the seller later needs this "assigned amount" to achieve compliance, the sale will not be consummated.⁶ If the buyer was relying on the purchased "assigned amount" to achieve compliance, failure to consummate the transaction means the buyer will not comply with its commitments.

Buyers can protect themselves by insisting on insurance or performance bonds to replace the "assigned amount" from a transaction that is subsequently disallowed with valid

"assigned amount" or equivalent instruments. The cost of the insurance or performance bond will rise with the risk of non-compliance and, at some point, coverage will not be available and the seller will be unable to export any more "assigned amount".

Since Parties report their actual emissions annually, companies can update their assessment of the probability of compliance with the cumulative budget each year.⁷ Parties will also have an incentive to register transactions quickly. Thus companies will be able to adjust the premium for each Party to reflect the risk of non-compliance at the time of the transaction.

The market price will set a price for one tonne of CO₂ equivalent of valid "assigned amount" or "certified emissions reductions" from the Clean Development Mechanism. Since the price covers a tonne of valid "assigned amount" the cost of the insurance or performance bond lowers the revenue from the sale of the "assigned amount". Thus, the cost of the insurance or performance bond creates an economic incentive for sellers to comply with their international commitments.

As a result of the economic incentive for sellers to remain in compliance, the number of transactions invalidated is likely to be relatively small.⁸

Two conditions must be met to enable this approach to work effectively:

- Transactions must be invalidated in reverse chronological order until the seller achieves compliance;⁹ and
- The insurance or performance bond must be transferable and remain in effect until the seller's compliance (or non-compliance) is established.

These conditions are discussed in the next section.

Characteristics of the Insurance Coverage/Performance Bond

Transactions must be invalidated in reverse chronological order until the seller achieves compliance. This is important for three reasons. First, disallowing transactions in reverse order minimizes the number of transactions affected. Second, it creates an incentive to register transactions quickly because earlier sales have a lower probability of disallowance than later deals. Since transactions are registered quickly companies will have accurate current information about the seller's commitments when calculating the premium for a proposed sale.

Third, it does not change the risk of default from what it was at the time of the transaction. If all transactions were reduced proportionally to bring the seller into compliance, the risk associated with an early transaction would be affected by subsequent sales. It would be very difficult to establish premiums because later sales would increase

the risk of disallowance. Invalidating transactions in reverse chronological order means that the risk associated with a proposed sale is not affected by subsequent sales.

The insurance or performance bond must be transferable and remain in effect until the seller's compliance (or non-compliance) is established. Assuming non-government entities can engage in emissions trading, once a quantity of "assigned amount" enters the market it could be resold many times. The insurance coverage or performance bond for the initial transaction should remain in effect, regardless of the number of times the "assigned amount" is resold, until the seller achieves compliance after the end of the commitment period. Since transactions are invalidated in reverse chronological order and depend only on the performance of the seller, the risk does not change with resale.

The insurance coverage or performance bond may need to remain in effect for up to seven years. The commitment period runs from 2008 through 2012 and it will likely be two years later before actual emissions are reported and compliance can be established. Thus a transaction initiated early in 2008 could require coverage for about seven years.¹⁰ But a transaction initiated in 2012 would only require coverage for two years. On average coverage might be required for about five years.

Buyers will want to use the "assigned amount" purchased to achieve compliance. Ideally, the insurance or a performance bond should provide valid "assigned amounts" to replace those from a purchase that is subsequently disallowed. Financial compensation for the value of the disallowed sale will not bring the buyer into compliance. However, financial compensation would be acceptable if the rules allowed buyers whose transactions had been invalidated extra time to comply, as would be the case with escrow accounts.

Valid "assigned amount" can be acquired in any of the following ways: purchasing valid "assigned amount" from Parties in compliance with their commitments, purchasing "certified emission reductions" through the Clean Development Mechanism, or purchasing valid domestic allowances or credits of the importing country to replace the imported "assigned amount". In future commitment periods, companies could purchase "assigned amount" banked from a previous period.

Magnitude of the Exposure

The amount of "assigned amount" transferred and the market price can not be accurately predicted at this time. However, rough estimates suggest that the value of "assigned amount" transferred could range between \$1 and \$16 billion per year; say \$8 billion per year as a central estimate.¹¹ Over the five years from 2008 through 2012 the total amount of "assigned amount" transferred would be five times as large, for a central estimate of \$40 billion.

This is an estimate of the value of transfers for which insurance or performance bonds is required. The total value of trades could be much higher, but the insurance or performance bond is assumed to remain in effect and to be transferred when "assigned amount" is resold.

Although the commitment period is five years, it will probably be two years after the end of the period before it is possible to establish compliance for all sellers. Transactions for the second commitment period would take place during this period. Thus the total exposure for the companies providing insurance coverage and performance bonds is more likely to be the equivalent of seven years of sales -- \$56 billion.

Financial institutions providing insurance or performance bonds could reduce their exposure by purchasing futures or options for "assigned amount". The International Petroleum Exchange has announced that it proposes to launch a CO₂ emissions futures contract as soon as a primary market has been established.¹² The Clean Development Mechanism can begin to certify emissions reductions created by projects in developing countries beginning in 2000. Certified emissions reductions can be used by Annex I Parties in exactly the same way as assigned amount, so a primary market and futures trading could be established before 2008.

Further Research

Further research is needed to confirm that insurance coverage or performance bonds with the required features would be considered an attractive product by a number of firms. A number of firms would need to offer these products to ensure that premiums are competitive.

Further research is also needed to confirm that the total exposure is manageable for the firms involved, or to identify ways to reduce the total exposure.

Unfortunately, this work needs to be completed before November 1998 otherwise the Conference of the Parties may adopt rules for international emissions trading that reflect seller liability. That option is administratively simpler and does not involve insurance or performance bonds.

Notes

¹ For convenience, each Party would have a single account for each commitment period. Ideally, all accounts would be held by the same institution.

² The financial institution holding the escrow accounts should not be eligible to lend funds to Parties using those accounts as security.

³ A seller might be tempted to negotiate sales that lead to immediate payment. For example, if the market price for "assigned amount" is \$5 per tonne, the seller might suggest that \$1 per tonne be deposited in the escrow account and that the buyer pay the seller \$3 per tonne directly to get immediate payment. The total price would need to be less than the market price since the risk to the buyer is higher because there is less money in the escrow account to compensate for any reduction in the quantity of "assigned amount" held. A buyer might be more willing to do this later in the period if there is already a large balance in the escrow account, but then the immediate payment is less attractive for the seller since it could probably borrow more against the balance in the escrow account. In any case, a sale at an unusually low price would probably be

interpreted as a signal that compliance was unlikely. That would reduce the market price, limit additional sales, and limit the ability to borrow against the escrow account. Thus, circumvention of the escrow account is unlikely to be a major problem.

- ⁴ Conceptually it is possible to invalidate transactions in reverse chronological order or to adjust the holdings in proportion to the price paid, rather than to adjust the quantity held proportionally. Those approaches would create a different market price for the "assigned amount" sold in each transaction. A proportional reduction of the quantity creates a single market price for the "assigned amount" of a given country. Although prices will differ by country, this is a much simpler situation than one where market prices differ by country and transaction.
- ⁵ The registered owners of "assigned amount" as of a specified date would be the ones to have their holdings adjusted and receive compensation. This date should be known well in advance. This is equivalent to the payment of dividends on common shares to owners of record as of a specified date.
- ⁶ This could be implemented as follows. The Climate Change Secretariat would not make the transfer of "assigned amount" associated with any trade until after the end of the commitment period. Then it would implement the transactions in chronological order and invalidate transactions in reverse chronological order if necessary to bring the seller into compliance.
- ⁷ Since companies will rely on annual reports, which include emissions inventories, to establish their premiums, Parties have an incentive to submit high quality reports on time.
- ⁸ If the companies do their job well relatively few transactions will be affected because sales become financially unattractive as the risk of non-compliance, and eventual disallowance, rises.
- ⁹ If all transactions are disallowed and the Party is still not in compliance, then it would be subject to the penalties for non-compliance. But emissions trading has not contributed to the non-compliance.
- ¹⁰ Although the rules for international emissions trading remain to be agreed, they may well allow provisional transactions prior to 2008. In that case, the period for which insurance coverage would be required is correspondingly extended. But the costs of obtaining coverage for such a long period of time may discourage early transactions.
- ¹¹ International Energy Agency, *World Energy Prospects to 2020*, G8 Energy ministers' Meeting, Moscow, 31 March 1998, Table 3, p. 24, shows energy-related CO₂ emissions for groups of Annex I countries for 1990 and for "business as usual" in 2010. The reduction from BAU emissions required to meet the Kyoto commitment in Annex I countries other than transition economies is shown as 3,803 million tonnes of CO₂. Assume that the supplementarity provision limits the amount of "assigned amount" these countries can purchase to half of the total reduction, say 1,900 million tonnes of CO₂. The projected BAU emissions for transitional economies in 2010 are 3,769 million tonnes of CO₂, which is 657 million tonnes below 1990 levels. Thus, these countries should be able to sell at least 650 million tonnes of "assigned amount". Implementing energy efficiency measures to reduce demand by 25% in 2010 would make another 950 million tonnes of "assigned amount" available. Thus, the supply of "assigned amount" is probably between 650 and 1,600 million tonnes of CO₂ while the demand could be as high as 1,900 million tonnes of CO₂. Prices currently range from less than \$1 to about \$3 per tonne of CO₂. The U.S. Council of Economic Advisors has estimated the price to be between \$18 and \$23 per tonne of carbon – about \$5 per tonne of CO₂ – assuming international emissions trading. Using a range of \$1 to \$10 per tonne of CO₂, the value of "assigned amount" transferred could range from \$0.65 to \$19 billion per year. Consider a "central" price estimate of \$5 per tonne, if the quantity traded ranged between 650 and 1,900 million tonnes the value would be between \$3.25 and \$9.50 billion. Consider a "central" estimate of 1,600 million tonnes traded, if

the price ranged between \$1 and \$10 per tonne the value would be between \$1.6 and \$16.0 billion. A central value for these ranges is approximately \$8 billion per year.

¹² International Petroleum Exchange, *A Proposal to reduce CO2 Emissions in the European Union through the Introduction of an Emissions Trading Programme*, May 1998, p. 9.

FROM: USAID/G/ENV/DAA, David Hales

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Climate Change

Curtis

LB

(no action required)



U.S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT

AUG 6 1998

MEMORANDUM

TO: Distribution

FROM: G/ENV/DAA, David Hales

SUBJECT: Technology Cooperation Agreement Pilot
Project Activities

The Technology Cooperation Agreement Pilot Project (TCAPP) was launched last August to facilitate technology transfer of clean energy technologies to countries including Brazil, China, India, Indonesia, Kazakhstan, Mexico and the Philippines. In addition to USAID sponsorship, the project is supported by the U.S. Department of Energy and the U.S. Environmental Protection Agency, and works closely with private sector entities and international donor organizations.

The TCAPP will hold two meetings this Fall that are consistent with the Clean Growth Initiative, and which are essential to the President's Climate Change Initiative.

On September 24, 1998, USAID, and the Business Council for Sustainable Energy will host a Private Sector meeting to promote discussion of Private Sector engagement in market development and the acceleration of clean energy investment. Administrator Brian Atwood will open and participate in the meeting, as will EPA Assistant Administrator, David Gardiner, and others from USAID.

On October 9, 1998, the TCAPP team, lead by Ron Benioff of the National Renewable Energy Laboratory, and Jeff Seabright of USAID, among others, will host a Technology Cooperation Agreement Donor Workshop for multilateral and bilateral donor organizations, officials from participating countries, and various private sector organizations including the UN Foundation. Material on each of these events is attached to this memorandum.

Attachment: A/S

TECHNOLOGY COOPERATION AGREEMENT PILOT PROJECT

A Partnership to Open Markets for Clean Energy Technologies and Facilitate Sustainable Development

Technology transfer of clean energy technologies through foreign direct investment strengthens markets and assists developing countries in meeting their urgent economic development goals. However, regulatory, financial and institutional barriers inhibit investment, denying clean energy products and services to consumers in the developing world and constraining market development in these sectors. The U.S. Agency for International Development, as part of its billion dollar Climate Change Initiative has recently launched a project to assist developing countries in an effort to stimulate private investment in clean energy technologies. This project, known as the Technology Cooperation Agreement Pilot Project (TCAPP) aims to foster investment by removing market barriers and stimulating private sector activity.

What is the Technology Cooperation Agreement Pilot Project?

The Technology Cooperation Agreement Pilot Project (TCAPP) was launched in August 1997 to facilitate technology transfer of clean energy technologies in Brazil, China, India, Indonesia, Kazakhstan, Mexico, and the Philippines. Clean energy sources include renewable energy, energy efficiency and natural gas. The project is supported by several government agencies, including the U.S. Agency for International Development, the U.S. Department of Energy, and the U.S. Environmental Protection Agency, international donor organizations and the private sector.

The project has three goals:

- Foster private investment in clean energy technologies which reduce greenhouse gas emissions and speed economic development
- Engage in-country and international donor support for actions to build sustainable markets for clean energy and clean energy technologies
- Establish technology cooperation agreements as organizing structures for coordinating in-country, donor and private sector climate change mitigation efforts

The TCAPP is being implemented in three stages. In the **first stage**, country teams identify priority areas and work with technical advisors from the U.S. government and other stakeholders to define actions that donor organizations, the country, and the private sector could take to accelerate the deployment of the priority technologies. During the **second stage** of the project, the country teams receive feedback from technical experts, donor organizations and private companies, which help them refine the technology priorities and actions to more effectively stimulate market development. The **third stage**

**The U.S. Agency for International Development and the
Business Council for Sustainable Energy**

invite you to attend a

PRIVATE SECTOR MEETING
FOR THE
TECHNOLOGY COOPERATION AGREEMENT PILOT PROJECT

Date: Thursday, September 24, 1998
Time: 9:00 a.m. - 11:30 a.m.
Location: Administrator's Conference Room
U.S. Agency for International Development
Ronald Reagan Building, 14th and Constitution Avenue, NW
Washington, DC

The U.S. Agency for International Development, as part of its \$1 billion Climate Change Initiative, has recently launched a project to assist developing countries in an effort to stimulate private investment in clean energy technologies. This project is known as the Technology Cooperation Agreement Pilot Project (TCAPP) and is supported by the U.S. Department of Energy and the U.S. Environmental Protection Agency.

The aim of the TCAPP is to accelerate private sector investment in clean energy sources in developing countries. The pilot project matches developing country energy priorities with private sector investors. To achieve its objectives, funding and resources from the U.S. government and other sources will be used to accelerate technology transfer and to remove investment barriers to clean energy and clean energy technologies. The project aims to enhance the marketplace, but it can only succeed if it involves the private sector.

The countries involved in the TCAPP represent some of the biggest emerging markets for energy development – China, Mexico, Brazil, the Philippines, India, Kazakhstan, and Indonesia. As a leader in the sector, we want to hear your views on the project and how you think the private sector can best participate to ensure its success. Further, the TCAPP is being promoted as a model for multilateral technology cooperation agreements, which increases the urgency of getting private sector advice early in the process.

The meeting will feature opening remarks by U.S. AID Administrator Brian Atwood, and presentations on the TCAPP's objectives, status of country frameworks, the private sector's partnership with the TCAPP and donor participation with the TCAPP. The presentations will be followed by a group discussion.

Participants will consider the following questions:

- How can the private sector best participate in the TCAPP?
- What specific actions should be taken to facilitate market development and accelerate clean energy investment in TCAPP countries?
- How can the TCAPP be structured to provide the greatest benefit to the private sector?

RSVP: Please fax back this form below, or respond with the information below via email to:
Lisa Jacobson, Director, International Programs
Business Council for Sustainable Energy
Fax: (202) 785-0514 E-mail: ljacobson@bcse.org

Name: _____	Title: _____
Company: _____	
Address: _____	
Telephone: _____	Fax: _____ Email: _____
YES, I will attend the TCAPP Private Sector meeting _____	
NO, I will not be able to attend the TCAPP Private Sector meeting, but please send me information _____	
NO, I will not be able to attend the TCAPP Private Sector meeting _____	

Technology Cooperation Agreements Donor Workshop

Date: Friday, October 9, 1998
Time: ~~TBD~~ 9:00 am to 4:30 pm
Location: TBD, Washington, DC

Background

In August 1997, the Technology Cooperation Agreement Pilot Project (TCAPP) was launched to develop model climate change technology cooperation agreements that would stimulate greater use of clean energy technologies (renewable energy, energy efficiency, and natural gas) in developing countries. The project is supported by the U.S. Agency for International Development, the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the National Renewable Energy Laboratory.

Under TCAPP, intergovernmental teams in Brazil, China, Kazakhstan, Mexico, and the Philippines have been preparing frameworks that identify the most promising opportunities for enhancing private investment in clean energy technologies. In addition, the Business Council for Sustainable Energy and the Environmental Enterprises Assistance Fund have established a process for obtaining input from international energy companies and the private finance community on the actions identified in these frameworks. This project is providing practical models for the concept of technology cooperation agreements advanced by the International Energy Agency.

The meeting on October 9 is to discuss opportunities to use the TCAPP frameworks and process to attract private investment for the clean energy priorities established by the countries.

Workshop Goals

- Present the draft country frameworks and process for engaging the business and financial community
- Present a strategy for using TCAPP to attract sustained private investment in clean energy technologies
- Determine how to make TCAPP most valuable to the donor community and increase the involvement of the donor community in future efforts to use the TCAPP process to stimulate private investment

Participants

We expect 30-40 participants from among:

- Multilateral and bilateral donor organizations
- U.S. Government agencies
- Officials from the participating countries
- U.N. Foundation and other international foundations
- Collaborating institutions

For More Information

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Technology Cooperation Agreement Pilot Project

Donor Workshop — October 9, 1998

Invitation List

Bilaterals

AUSTALIA

Mr. Robert Glasser
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Canada

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Environment Advisor

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Senior Environmental Policy Advisor

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Mr. Joachim Metzner
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Mr. Peter Christmann
Ministry for Economic Co-operation and Development

Mr. Joseph Gamperl
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Shigemoto Kajihara

Netherlands Ministry of Foreign Affairs

Ard Kant, Director of Netherlands JI Program

NORWAY

Ms Inger-Marie Bjønness
Environmental Programme; NORAD

Ms Inger Ness
Ministry of Foreign Affairs

SWEDEN

Mr. Mats Segnestam
Environment Policy Division, Sida

SWITZERLAND

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Development Division; Investment Promotion and
Mixed Financing Section

United Kingdom

Allan Davis

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European Commission

Ms. Liselotte Isaksson

Multilaterals**Asian Development Bank (ADB)**

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Global Environment Facility (GEF)

Alan Miller, GEF Secretariat

Frank Rittenhauer

Inter-American Development Bank (IDB)

Jaime Millan

Connie Smyser

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Hans Jurgen-Koch

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United Nations Framework Convention on Climate Change (UNFCCC)

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Shamima Khan, ASTAE Country Coordinator for the Philippines

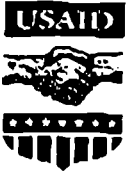
Eric Martinot, Environment Department

Jan Pakulski, Regional Officer for Europe/Central Asia, World Bank

Dana Younger, IFC

Mr. Kadir Yurukoglu, ASTAE Country Coordinator for Kazakhstan

Country Officers for Brazil, China, Kazakhstan, Mexico, Philippines



U.S. AGENCY FOR
INTERNATIONAL
DEVELOPMENT

AUG 6 1998

MEMORANDUM

TO: Distribution

FROM: G/ENV/DAA, David Hales

SUBJECT: Technology Cooperation Agreement Pilot
Project Activities

The Technology Cooperation Agreement Pilot Project (TCAPP) was launched last August to facilitate technology transfer of clean energy technologies to countries including Brazil, China, India, Indonesia, Kazakhstan, Mexico and the Philippines. In addition to USAID sponsorship, the project is supported by the U.S. Department of Energy and the U.S. Environmental Protection Agency, and works closely with private sector entities and international donor organizations.

The TCAPP will hold two meetings this Fall that are consistent with the Clean Growth Initiative, and which are essential to the President's Climate Change Initiative.

On September 24, 1998, USAID, and the Business Council for Sustainable Energy will host a Private Sector meeting to promote discussion of Private Sector engagement in market development and the acceleration of clean energy investment. Administrator Brian Atwood will open and participate in the meeting, as will EPA Assistant Administrator, David Gardiner, and others from USAID.

On October 9, 1998, the TCAPP team, lead by Ron Benioff of the National Renewable Energy Laboratory, and Jeff Seabright of USAID, among others, will host a Technology Cooperation Agreement Donor Workshop for multilateral and bilateral donor organizations, officials from participating countries, and various private sector organizations including the UN Foundation. Material on each of these events is attached to this memorandum.

Attachment: A/S

TECHNOLOGY COOPERATION AGREEMENT PILOT PROJECT

A Partnership to Open Markets for Clean Energy Technologies and Facilitate Sustainable Development

Technology transfer of clean energy technologies through foreign direct investment strengthens markets and assists developing countries in meeting their urgent economic development goals. However, regulatory, financial and institutional barriers inhibit investment, denying clean energy products and services to consumers in the developing world and constraining market development in these sectors. The U.S. Agency for International Development, as part of its billion dollar Climate Change Initiative has recently launched a project to assist developing countries in an effort to stimulate private investment in clean energy technologies. This project, known as the Technology Cooperation Agreement Pilot Project (TCAPP) aims to foster investment by removing market barriers and stimulating private sector activity.

What is the Technology Cooperation Agreement Pilot Project?

The Technology Cooperation Agreement Pilot Project (TCAPP) was launched in August 1997 to facilitate technology transfer of clean energy technologies in Brazil, China, India, Indonesia, Kazakhstan, Mexico, and the Philippines. Clean energy sources include renewable energy, energy efficiency and natural gas. The project is supported by several government agencies, including the U.S. Agency for International Development, the U.S. Department of Energy, and the U.S. Environmental Protection Agency, international donor organizations and the private sector.

The project has three goals:

- Foster private investment in clean energy technologies which reduce greenhouse gas emissions and speed economic development
- Engage in-country and international donor support for actions to build sustainable markets for clean energy and clean energy technologies
- Establish technology cooperation agreements as organizing structures for coordinating in-country, donor and private sector climate change mitigation efforts

The TCAPP is being implemented in three stages. In the **first stage**, country teams identify priority areas and work with technical advisors from the U.S. government and other stakeholders to define actions that donor organizations, the country, and the private sector could take to accelerate the deployment of the priority technologies. During the **second stage** of the project, the country teams receive feedback from technical experts, donor organizations and private companies, which help them refine the technology priorities and actions to more effectively stimulate market development. The **third stage**

**The U.S. Agency for International Development and the
Business Council for Sustainable Energy**

invite you to attend a

PRIVATE SECTOR MEETING
FOR THE
TECHNOLOGY COOPERATION AGREEMENT PILOT PROJECT

Date: Thursday, September 24, 1998
Time: 9:00 a.m. - 11:30 a.m.
Location: Administrator's Conference Room
U.S. Agency for International Development
Ronald Reagan Building, 14th and Constitution Avenue, NW
Washington, DC

The U.S. Agency for International Development, as part of its \$1 billion Climate Change Initiative, has recently launched a project to assist developing countries in an effort to stimulate private investment in clean energy technologies. This project is known as the Technology Cooperation Agreement Pilot Project (TCAPP) and is supported by the U.S. Department of Energy and the U.S. Environmental Protection Agency.

The aim of the TCAPP is to accelerate private sector investment in clean energy sources in developing countries. The pilot project matches developing country energy priorities with private sector investors. To achieve its objectives, funding and resources from the U.S. government and other sources will be used to accelerate technology transfer and to remove investment barriers to clean energy and clean energy technologies. The project aims to enhance the marketplace, but it can only succeed if it involves the private sector.

The countries involved in the TCAPP represent some of the biggest emerging markets for energy development – China, Mexico, Brazil, the Philippines, India, Kazakhstan, and Indonesia. As a leader in the sector, we want to hear your views on the project and how you think the private sector can best participate to ensure its success. Further, the TCAPP is being promoted as a model for multilateral technology cooperation agreements, which increases the urgency of getting private sector advice early in the process.

The meeting will feature opening remarks by U.S. AID Administrator Brian Atwood, and presentations on the TCAPP's objectives, status of country frameworks, the private sector's partnership with the TCAPP and donor participation with the TCAPP. The presentations will be followed by a group discussion.

Participants will consider the following questions:

- How can the private sector best participate in the TCAPP?
- What specific actions should be taken to facilitate market development and accelerate clean energy investment in TCAPP countries?
- How can the TCAPP be structured to provide the greatest benefit to the private sector?

RSVP: Please fax back this form below, or respond with the information below via email to:
Lisa Jacobson, Director, International Programs
Business Council for Sustainable Energy
Fax: (202) 785-0514 E-mail: ljacobson@bcse.org

Name: _____	Title: _____
Company: _____	
Address: _____	
Telephone: _____	Fax: _____ Email: _____
YES, I will attend the TCAPP Private Sector meeting _____	
NO, I will not be able to attend the TCAPP Private Sector meeting, but please send me information _____	
NO, I will not be able to attend the TCAPP Private Sector meeting _____	

Technology Cooperation Agreements Donor Workshop

Date: Friday, October 9, 1998
Time: ~~TBD~~ 9:00 am to 4:30 pm
Location: TBD, Washington, DC

Background

In August 1997, the Technology Cooperation Agreement Pilot Project (TCAPP) was launched to develop model climate change technology cooperation agreements that would stimulate greater use of clean energy technologies (renewable energy, energy efficiency, and natural gas) in developing countries. The project is supported by the U.S. Agency for International Development, the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the National Renewable Energy Laboratory.

Under TCAPP, intergovernmental teams in Brazil, China, Kazakhstan, Mexico, and the Philippines have been preparing frameworks that identify the most promising opportunities for enhancing private investment in clean energy technologies. In addition, the Business Council for Sustainable Energy and the Environmental Enterprises Assistance Fund have established a process for obtaining input from international energy companies and the private finance community on the actions identified in these frameworks. This project is providing practical models for the concept of technology cooperation agreements advanced by the International Energy Agency.

The meeting on October 9 is to discuss opportunities to use the TCAPP frameworks and process to attract private investment for the clean energy priorities established by the countries.

Workshop Goals

- Present the draft country frameworks and process for engaging the business and financial community
- Present a strategy for using TCAPP to attract sustained private investment in clean energy technologies
- Determine how to make TCAPP most valuable to the donor community and increase the involvement of the donor community in future efforts to use the TCAPP process to stimulate private investment

Participants

We expect 30-40 participants from among:

- Multilateral and bilateral donor organizations
- U.S. Government agencies
- Officials from the participating countries
- U.N. Foundation and other international foundations
- Collaborating institutions

For More Information

Please contact:

Ron Benioff
Energy and Environment Team Leader
National Renewable Energy Laboratory
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**Technology Cooperation Agreement Pilot Project
Donor Workshop — October 9, 1998
Invitation List**

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Holger Upton
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Mr. Kadir Yurukoglu, ASTAE Country Coordinator for Kazakhstan

Country Officers for Brazil, China, Kazakhstan, Mexico, Philippines

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Susan Gordon	State	647-0217
David Sandalow	CEQ/NSC	456-2710

CC: JY
JA
SP

August 5, 1998

Attached: EPA's Liability Paper for today's meeting:

(Previously circulated via email, primarily to staff)

From: State/OES/EGC

EMISSIONS TRADING: "LIABILITY" (ALLOCATING THE RISK OF SELLING PARTY'S NON-COMPLIANCE)

Issue for Decision: Should the buyer or the seller bear the risk that a selling Party may "oversell" and fail to retain enough assigned amount to cover its emissions at the end of the 5-year period?

General Background: A key U.S. objective for trading rules has been to create effective compliance incentives without undue burdens on the marketplace. Our proposals have consistently recognized a close relationship between emissions trading and compliance with the Annex B Parties' key obligations (accurate measurement and reporting of emissions and staying within assigned amounts). Effective compliance regimes are essential to meeting the Protocol's environmental objectives, and critical to a well-functioning and credible emissions trading system.

Our proposals have further recognized that there are only limited levers for promoting effective Party-level compliance in the context of international agreements. Rather than advocate negative sanctions (such as financial penalties or trade sanctions), the U.S. has sought to develop clear accounting rules under the provisions for emissions measurement and reporting (Articles 5 & 7), and positive incentives to observe those accounting rules through the rules for international trading (Article 17) and the other flexibility mechanisms. With the exception of liability, there is broad agreement among agencies on the following linkages between emissions trading and compliance.

Loss of Eligibility and Repayment with Penalty Provisions ("Seller Plus" Features)

- A Party that is not complying with its measurement and reporting obligations should lose its eligibility to engage in further emissions trading.
- A Party that has "run out" of assigned amount during the 5-year commitment period should lose its eligibility to make further sales (although it should still be able to buy).
- If a Party's has "over-emitted" at the end of the 5-year period, the Party should be required to deduct the excess, with a substantial penalty (e.g., 20-30%), from its assigned amount for the second period. The Party might also lose its eligibility to make sales in the second period. (NOTE: this provision could be defined as a general accounting rule, rather than a trading rule, because it would apply to any Party which over-emitted, regardless of its emissions trading activities)

These proposals are all *prospective*. They limit trading activity or require repayment of debits in the future. Their compliance incentive value lies in Parties' reluctance to risk losing the cost savings or investment benefits of trading, or incurring the penalty deduction from the second budget period. The question still needing resolution is whether there should also be any *retrospective* linkages that would affect the status of the "tradeable units" that a Party previously sold?

- This is the issue of seller or buyer liability. Specifically, if a selling Party has "over-emitted" at the end of the period, should the tradeable units it previously sold remain the property of the buyer (seller bears the risk)? Or should they be returned to cure the seller's deficit (buyer bears the risk)?

In analyzing this question, we have looked at a range of options and attempted to assess their consequences for compliance and for market function. (We are currently in the midst of consultations

with stakeholders on these issues.)

Options:

1) **"Seller bears the risk."** In the purest form of seller liability, the trading rules would make no linkages at all, prospective or retrospective, with compliance issues. Agencies agree that this approach provides insufficient incentives for compliance: Parties could be encouraged to deliberately or carelessly over-sell and not retain enough assigned amount to cover their own emissions.

2) **"Seller plus."** This approach relies on the prospective "loss of eligibility" and "repayment with penalty" linkages described above, but includes no retrospective linkages. Tradeable units already sold remain the property of the buyer.

Benefits: Places least burden on marketplace. Units purchased from another Party are fungible and have a clear value, with no contingencies. Buyers do not need to assess the risk of the selling Party's ultimate compliance.

Downsides: Disagreement over whether prospective linkages alone are sufficient to prevent careless or deliberate "over-selling" by a government with only a short-term focus or no interest in complying.

3) **"Buyer bears the risk."** In the purest form of buyer liability, all purchases are made at the risk that they can be taken back if the selling Party "over-emits" at the end of the period. The most likely method would be that the last units sold would be the first ones returned (LIFO). Buyers would have to assess the risks of a Party's non-compliance and use discounts, portfolio approaches, insurance, and other tools to cope with the uncertainty.

Benefits: Creates strongest incentives and guarantees against over-selling. A risky Party will receive lower prices for its units, thereby having a financial incentive to comply. Excess emissions are automatically covered up to the extent of prior sales.

Downsides: Requires private sector buyers to assess and manage the likelihood of various selling Parties' eventual non-compliance. While tools for doing so efficiently could develop over time, this approach may impose a significant burden on the emissions trading market in its start-up phase. For buyer Parties, this approach creates a risk of a "domino effect" in which a selling Party's non-compliance can lead to a buyer Party's non-compliance. It could take a year or two after the end of the 5-year period to definitively sort out the Parties' final compliance status.

4) **Potential Hybrids.** Other approaches could also be considered that converge between "seller plus" and "buyer liability."

- **"Seller plus-plus."** For example, adding to "seller plus," there could be a prohibition on selling tradeable units at an unsustainable rate (i.e., at a rate that, also considering the Party's emission rate, places its eventual compliance in doubt). This would be an additional prospective restriction, and it would kick in before the Party had completely "run out" of its assigned amount. It would require agreement on a formula to determine what rate of sales should be considered unsustainable.

- **"Seller/Buyer."** Alternatively, the rule could be that sales above the unsustainable rate are still permitted, but only under buyer liability. In other words, trading would start on the basis of seller liability, but would switch to buyer liability if the Party were selling at an unsustainable rate. Only sales under the condition of buyer liability would be subject to retrospective recall if the selling Party "over-emits" at the end of the period.

These approaches add more incentives for compliance than "seller plus," but place less burden on the marketplace than "buyer liability." The first hybrid still protects all past trades, but does not allow a Party to sell as much of its assigned amount as "seller plus." The second hybrid protects most past trades; it also allows the selling Party to sell the "unsustainable" increment of its assigned amount, but only under the condition of buyer liability.

Positions of U.S. Stakeholders and other Parties:

There is general recognition by U.S. stakeholders (including many, but not all in industry), that pure seller liability is not acceptable, and that some compliance linkages are appropriate. Most firms that are potential buyers have a preference for "seller plus" over "buyer liability." A minority of potential buyers, as well as U.S. environmental organizations, prefer "buyer liability." There is a lot of interest in learning about hybrids.

Among the Parties, the EU has staked out a position in favor of buyer liability, although they also agree with the prospective limitations (the "plus" proposals) we have offered. The Umbrella Group countries are generally in the "seller plus" camp, also may be interested in hybrids.

Recommendations

We have agreed with our umbrella group partners that the objective of establishing an international greenhouse gas emissions trading system is to achieve environmental objective of the Kyoto Protocol to reduce emissions by at least 5% below 1990 levels at the lowest possible cost. In addition, the umbrella group has agreed that to promote confidence in the trading system, the system should be designed to be simple, credible, transparent, and with low transaction costs. Some have also proposed that the trading system could be designed to promote compliance from countries with economies in transition by providing funding for national monitoring system improvements and real investment in emission reduction projects. Based on these objectives, we should reject pure seller liability, effectively making the current "seller plus" approach the minimum option under consideration. We should complete stakeholder consultations and development of the hybrid approaches this month, so that further judgments can be made internally as to their acceptability, and so that they can be explored with other Parties in international meetings in September. While not ruling it out, we should express strong concerns to the EU about the problems with its buyer liability proposal and seek their views on hybrids. We should continue working with the Umbrella Group for a common position on hybrid approaches.

Office of Economic Policy

Department of the Treasury
Washington, D.C. 20220cc: JY
TH
SD

FAX

Date: 7/31/98

Number of pages including cover sheet: 2

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Mark Mazur	586-9626	
Sanet Anderson	395-2311	
From: Robert Cumby	202-622-2633	202-622-

Remarks: ☒ URGENT ☐ For your review ☐ Reply ASAP ☐ Please comment

Here is a "Table of Contents" version to the early credit memo. Please send any comments.

Bob

Outline for Discussion of Principles for an Early Credit Mechanism

- I. **Baseline Protection vs. Credits for Early Action**
 - A. Baseline protection
 - B. Credits for early actions
 - C. Some combination of the two
- II. **Design Issues for an Early Credit System with Caps**
 - A. A one-part vs. a two-part system
 - B. First come first served vs. "truing up" at end of period
- III. **What is the Appropriate Measure for Early Credit?**
 - A. Emissions level
 - B. Emissions rates
 - C. Project-by-project evaluation
- IV. **Options for Defining the Baseline**
 - A. Changes from starting point
 - B. Changes from projected reduction schedule
 - C. Changes from business as usual
 - D. Predefined set of eligible actions or technologies
- V. **The Scope of Emissions Measurement**
 - A. Direct and indirect emissions from production
 - B. Emissions from production vs. consumption
- VI. **Data and Measurement Issues**
 - A. Defining a firm
 - B. Measuring carbon efficiency

THE WHITE HOUSE
WASHINGTON

98 JUL 25 10:31:45

July 26, 1998

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MEMORANDUM FOR THE PRESIDENT

FROM: TODD STERN *For*

SUBJECT: Climate Change Weekly Report (weeks of July 13 and 20)

Congressional

Appropriations. A little good news in the House this week. First, we worked with Rep. Obey on an amendment to override the Knollenberg gag order in the report to the VA-HUD bill. The amendment passed 226-198, with 175 Ds and 51 Rs voting for it. Rep. Greenwood had planned to offer an amendment to neutralize the Knollenberg bill language, but at the last minute, Greenwood, decided to not offer it. We were working this hard, as were the enviros. It would surely have lost, but probably with a respectable vote. Greenwood, along with Reps. Boelherth and Waxman, criticized the bill language during floor debate. Because the Senate bill does not contain any such language on this issue, we are hopeful that we can work with the Senate and these House members to modify the language in conference.

Second, after an initial 213-212 defeat, the House accepted a Skaggs/Fox amendment to the Interior Approps bill to add back \$45 million to DOE's energy efficiency budget; \$34 million of this was part of our climate change initiative. This still leaves us far below your requested increase of \$193 million, but it was an important step in the right direction.

Domestic policy

Economic analysis. CEA's economic analysis, which provides the underpinning to Janet Yellen's February economic testimony on the Hill, is ready for release. There is one open issue that I will address through a separate memo that should be ready for your review Monday or Tuesday.

Federal energy. As you know, we used this week's radio address to roll out the first four elements of your federal energy plan, all related to significantly reducing the use of energy in federal buildings. A good AP story ran in the Sunday *Washington Post*. Your announcement included: (1) a directive to all agencies urging them to maximize their use of energy saving performance contracts, accompanied by specific OMB guidance; (2) a new campaign to replace 300,000 light bulbs/fixtures in federal buildings with fluorescents in the next three years; (3) a directive to agencies to maximize efforts to earn EPA's Energy Star label for their buildings; (4) DOD's and six other agencies' agreement to build all new buildings, starting in the year 2000, according to sustainable design principles (e.g., 50% more energy efficient). We are pressing ahead on the other elements of your federal energy plan.

good

*Unreviewed
Good for meeting
Next high level
meeting
Implementation
February 27*

Auto tax credit. I met separately with GM and Chrysler this week to see if the logjam could be broken in discussions on an auto tax credit. The discussions to date, led by NEC, CEQ and OVP, have foundered on the companies' opposition to a performance based credit (i.e., a credit for cars that achieve two/three times ordinary mileage for their class). What they would support is a credit for use of specific technologies -- such as hybrid engines. Our side has resisted until now out of concern that unless the credit is performance based, you can't be certain that greenhouse gas emissions will decline; the technology could be put into larger cars so that net emissions, compared to a conventional engine in a smaller car, were the same. GM argues that these technologies will always save emissions because even if the hybrid goes into a bigger car, it'll emit less than a conventional engine in the bigger car. My feeling is that to have an auto tax credit which Detroit would actively support on the Hill would be a huge boost for us -- and would give us a transportation initiative with some zip -- so I want to rapidly explore whether we can't bend enough to make a deal. Adequate acceptance by the environmental community (which likes our performance based proposal) would be essential to make this work.

Industry consultations. We met recently with CEOs from the steel, cement and forest products industries. The meetings were cordial, but there is a good deal of wariness on the part of many of these leaders. They are uncertain about the level of reductions that would be expected of them under a ratified treaty, uncertain about how mechanisms like trading would work, and concerned about the lack of developing country participation. The Asian financial crisis has made this last concern a good deal more acute, especially for industries like steel and forest products facing stiff competition from those countries. The idea that our Kyoto obligations would give these countries *another* price advantage (beyond cheap labor and a devalued currency), riles many of these CEOs. We, of course, stress the value of working in partnership with us, but with many industries, this is going to be tough sledding.

Diplomatic

A senior Chinese official has offered one of the most positive statements from her government to date on the topic of emissions trading. Deng Nan, Vice Minister of Science and Technology (and daughter of Deng Xiaoping), said that China is willing to work with other countries to develop rules for emissions trading and would welcome further discussions with the U.S. on this topic. The remarks came during a ceremony attended by Ambassador Sasser, launching a program to build a demonstration energy efficient building in Beijing.

The G-8 climate change working group held its first meeting last week in London. Talks were constructive, but underscored the wide gaps between ourselves and the EU on the difficult issue of emissions trading. EU officials continue to insist on a percentage cap on the amount of reductions that any country may purchase from abroad.

Communications

Tuesday and Wednesday, *CNN* aired a strong two-minute segment on climate change that included footage of the heat wave in the Southwest, the Vice President's event last week and your speech to the AFT. Anti-climate remarks by Rep. Knollenberg were countered by a litany of recent weather data. On Thursday, *The Los Angeles Times* ran a story detailing your and the Vice President's recent activity on climate change. There was also significant press coverage of the House vote to drop the "gag order." In next week's issue, *Newsweek* is expected to run a piece on the heat wave, its connection to climate change and its agricultural implications.

Editorials. Our editorial mailing of a couple weeks ago continued to pay dividends. The *Washington Post*, *Detroit Free Press*, and *Los Angeles Times* all editorialized against the gag order provision in the VA, HUD bill. The *Free Press* also criticized the funding cuts. On Sunday, July 12, the *New York Times*, ran an editorial attacking the Knollenberg and other anti-environmental riders. On Friday, July 17, the *Times* editorialized on the heat wave in the South and Southwest and its possible link to global warming.

The Vice President's weather event on Tuesday, July 14, was covered by NBC and ABC in long pieces on the Texas drought, and also received a good deal of print coverage.

United Technologies Corporation pledged to reduce energy use 25% by the year 2007 in over 240 facilities worldwide. A congratulatory letter from you was sent to the CEO, George David.

cc: Vice President
Erskine Bowles
John Podesta
Ron Klain
Jack Lew
Katie McGinty
Mike McCurry
Gene Sperling
Jim Steinberg
Janet Yellen

Ce. JY
JA
SP

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OFFICE OF THE UNDER SECRETARY FOR GLOBAL AFFAIRS
2201 C Street, N.W., Room 7250
Washington, D.C. 20520

F A X C O V E R S H E E T

DATE: July 24, 1998

TIME: 12:10 p.m.

TO:	Todd Stern	AGENCY:	WH	FAX:	456-2215
	David Sandalow		WH/CEQ/NSC		456-2710
	Bill Antholis		WH/NEC		456-5334
	Dirk Forrister		WH/CCTF		343-1162
	Jeffery Frankel		WH/CEA		395-6958
	Joe Aldy		WH/CEA		
	Michael Orfini		OVP		456-9500
	Amb. Hattie Babbitt		AID		216-3455
	David Hales		AID		216-3230
	Jeffery Seabright		AID		216-3230
	Jeffery Hunker		Commerce		482-4636
	Nazir Bhagat		Commerce		482-5666
	Robert Boorstin		Treasury		622-0073
	Helen Walsh		Treasury		622-1228
	David Doniger		EPA		260-5155
	David Gardiner		EPA		260-0275
	Mark Mazur		Energy		586-9626

FROM: Nigel Purvis
Special Assistant
for Oceanic, Environmental
and Scientific Affairs

PHONE: 647-8745
FAX: 647-0753

RE: SHERMAN/EIZENSTAT CLIMATE CHANGE MEETING

Number of pages (including cover sheet): 3

07/24/98 13:18

**Purvis, Nigel**

From: Purvis, Nigel
Sent: Friday, July 24, 1998 12:07 PM
To: Bass, Peter E; Biniarz, Susan; Gordon, Susan; Greenfield, Victoria A; Hambley, Mark; Hobgood, Teresa D; Hobgood, Teresa D1; Jacobs, Susan S.; Kimble, Melinda; Norton, Julia; Pence, Constance; Pershing, Jonathan; Pomerance, Rafe; Povenmire, Susan; Povenmire, Susan L; Prince, Jonathan; Reifsnyder, Daniel; Thompson-Abington, Carol
Subject: Eizenstat/Sherman Climate Change Meeting

Attached is a summary of follow-up items from last Monday's meeting. The next Eizenstat/Sherman meeting will occur on Monday, August 3, from 3-4 in room 7250.

→ JAF is out of town.



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July 24, 1998

Summary of Outcomes from the Eizenstat/Sherman
Climate Change Meeting, Monday, July 20
(Next Meeting: Monday, August 3, 3:00-4:00, Room 7250)

- CEA to release economic analysis
- Energy Department to report on status of EIA study
- OES to prepare background and talking points for Under Secretary Eizenstat to call Canadian Minister Stewart
- DOS to integrate climate change points into the Secretary of State's meetings with ASEAN and regional partners (done)
- Assistant Secretaries' group to prepare BA issue papers for review by the Oversight Group (in progress)
- OES to distribute an updated diplomatic calendar at the next meeting
- WH to distribute a public outreach calendar at the next meeting
- WH, EPA and DOS to summarize status of climate change amendments on the Hill