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International Clean Energy Initiative

To accelerate the development and deployment of clean energy technologies around the world, President Clinton is proposing the International Clean Energy Initiative – a $200 million multi-agency effort (a more than 100 percent increase over FY 2000 enacted levels) to encourage open competitive markets and remove market barriers to clean energy technologies in developing and transition countries and to provide new incentives for clean energy technology innovation and export. This initiative will promote U.S. exports and create high-value jobs, and will assist countries to power their economic development while fighting air pollution and climate change.

Window of Opportunity for America and the World. Developing country energy use will overtake that of industrial countries by 2020. These energy technology markets are projected to total $4 to $5 trillion over the next 20 years and $15 to $25 trillion over the next 50 years. Developing country energy use is expected to account for three-fourths of the increase in global energy use between now and 2050.

Advanced, low-polluting energy technologies, developed and manufactured in the United States, can provide these energy services efficiently, but existing markets often do not value environmental and efficiency benefits. In addition, environmentally superior options often carry higher up-front costs, may be unfamiliar, or are perceived as more risky by decision-makers in developing countries. The initiative builds on a recent set of recommendations by the President's Committee of Advisors on Science and Technology (PCAST) and is directed at leveling the playing field between cleaner U.S. energy technologies and services and polluting alternatives.

Real Benefits At Home and Abroad. The initiative will help lay the technical and policy foundation that will allow developing and transition countries to build a clean energy future, leapfrogging past the polluting energy technologies used by the industrial countries, while building competitive markets open to U.S. firms. The goals of this initiative include:

- Doubling clean energy technology exports by 2005, creating as much as $5 billion in new export revenues for U.S. companies and as many as 100,000 new U.S. jobs.

- Cutting energy use in targeted country buildings and appliances in half through advanced building design tools and building equipment codes and standards.

- Developing integrated renewable energy technologies that have the potential to power the full range of energy services for the 2 billion people in developing countries that do not now have electricity.

- Sharply reducing sulfur, particulate, and greenhouse gas emissions by developing advanced coal-fired power plants and low-cost hydrogen fuels.

- Maximizing use of combined heat & power systems through technical and policy assistance.

- Reducing methane emissions from pipelines and other fossil sources by an amount equal to as much as 100 million metric tons of carbon per year by 2005.

- Providing technical and policy support to encourage the development of natural gas grids.

- Reducing energy use in the industrial sector through the introduction of best practice methods, including advanced sensors and controls, and energy efficient motor drive systems.

- Conducting research in nuclear energy to address cost, waste, safety, and proliferation concerns.

- Providing technical and policy assistance in support of energy sector reform that creates open, competitive markets while protecting the public interest.

Initiative Structure. This initiative will strengthen efforts to streamline current bureaucratic procedures to better assist U.S. firms wishing to invest in clean energy projects in developing and transition countries. This initiative will also encourage public-private partnerships with foreign counterparts to demonstrate clean energy technologies, drive down their cost, and facilitate private sector financing for their large-scale deployment. The initiative will employ a range of proven policy tools, including U.S. technical and policy assistance to developing countries through personnel exchanges, conducting collaborative R&D with key foreign research groups, developing integrated renewable energy, energy efficiency, and advanced fossil energy technologies and pilot projects, and providing a range of trade supports to expand clean energy exports.

The initiative's requested $100 million increase for these activities includes an additional $46 million for the Department of Energy (DOE); $30 million for the U.S. Agency for International Development; $15 million for the Export-Import Bank; $5 million for the Trade and Development Agency; and $4 million for the Department of Commerce. A $3 million increase in base programs is also requested at DOE, bringing the total increase to $103 million.

President Clinton's FY 2001 Climate Change Budget

"The greatest environmental challenge of the new century is global warming . . . If we fail to reduce the emission of greenhouse gases, deadly heat waves and droughts will become more frequent, coastal areas will flood, and economies will be disrupted. That is going to happen, unless we act. Many people . . . still believe you cannot cut greenhouse gas emissions without slowing economic growth. In the Industrial Age that may well have been true. But in this digital economy, it is not true anymore. New technologies make it possible to cut harmful emissions and provide even more growth."

-- President Bill Clinton, State of the Union Address, January 27, 2000

Meeting the Challenge of Global Warming. Against a backdrop of growing scientific consensus that the Earth is warming – and that human activities are at least partly to blame – President Clinton's FY 2001 budget is proposing $2.4 billion (a 43 percent increase over FY 2000 enacted levels) in funding to combat global climate change. This includes a series of new initiatives, such as accelerated efforts to develop clean energy sources both at home and abroad and a new Clean Air Partnership Fund to boost state and local efforts to reduce greenhouse gases and air pollution, as well as a five-year package of tax incentives to spur clean energy technologies and increased investment for R&D in energy efficient technology and renewable energy. In addition, the President is proposing more than $1.7 billion for global change research, for a total package for FY 2001 of over $4 billion.

International Clean Energy Initiative. To help accelerate the development and deployment of clean energy technologies around the world, President Clinton is proposing $201 million (a more than 100 percent increase over FY 2000 enacted levels) for a multi-agency initiative to encourage open competitive markets; remove market barriers in developing countries to clean energy technologies; and to provide new incentives for clean energy technology innovation and export. The initiative will promote U.S. clean energy exports, create high-value jobs, and assist developing countries in fighting air pollution and climate change.

Bioenergy & Bio-based Products Initiative. The budget includes $289 million to accelerate the development of bio-based technologies, which convert crops, trees and other "biomass" into a vast array of fuels and products – an increase of $93 million over FY 2000 enacted levels. In addition to helping meet environmental challenges like global warming, this initiative will increase the viability of alternative energy sources, support farm incomes, and diversify and strengthen the rural economy.

Clean Air Partnership Fund. The President proposes $85 million for a new fund to provide grants to state and local governments for projects that reduce both greenhouse gases and pollutants like soot, smog, and air toxics.

Climate Change Technology Initiative (CCTI). The CCTI is a package of targeted tax incentives and investments aimed at increasing energy efficiency and spurring the broader use of renewable energy. The package will save consumers money and reduce greenhouse gas emissions at the same time. CCTI investments have risen substantially each of the past two years. The President's new budget proposes a still more accelerated effort.

$4.0 billion in Tax Incentives over 5 years. The proposed package contains $4.0 billion over five years in tax cuts ($201 million for FY 2001) for consumers who purchase energy efficient products and for producers of energy from renewable sources. This year's CCTI tax package is $400 million greater than last year's proposed five-year package. Highlights include:

- Tax credits for energy efficient homes. Consumers can receive a $1000-2000 credit toward the purchase of a new energy efficient home; a 20 percent tax credit for the purchase of selected energy efficient products for homes and buildings; and a $1000-2000 credit for installing a solar energy system.

- Tax credits for fuel-efficient cars. The package extends the current tax credit (of up to $4000) through 2006 for qualified electric and fuel cell vehicles and also includes a tax credit of $500-3000 for the purchase of a qualifying hybrid vehicle from 2003-2006.

- Tax credits for clean energy. The package extends the 1.5 cent per kilowatt hour tax credit for the production of electricity from wind and closed-loop biomass; provides credits for open-loop biomass facilities and coal-biomass cofiring; and provides credits for electricity produced from methane from certain landfills.

$1.4 billion for Energy Efficiency & Clean Energy. The proposed package contains over $1.4 billion in FY 2001 to research, develop, and deploy clean technologies for the four major carbon-emitting sectors of the economy -- buildings, transportation, industry, and electricity – a 30 percent increase over the amount appropriated in FY 2000. Highlights include:

- Partnership for a New Generation of Vehicles. PNGV is a government-industry effort to develop comfortable, affordable cars that meet all applicable safety and environmental standards and get up to three times the fuel efficiency of today's cars. The combined proposal for PNGV in the FY 2001 budget is $255 million, an increase of $30 million over FY 2000 enacted levels.

- Partnership for Advancing Technology in Housing. PATH is a government-industry partnership to improve the energy efficiency of new homes by more than 50 percent and to retrofit 15 million existing homes to make them 30 percent more energy efficient within a decade. The FY 2001 budget request for building efficiency efforts, such as PATH, Energy Star, and Building America, totals $275 million, a 42 percent increase over FY 2000 appropriations.

- Renewable Energy. The President proposes $410 million for the Department of Energy's solar and renewable energy programs, a 32 percent increase over the amount appropriated in FY 2000. The package includes expanded efforts in key renewable technologies, such as wind, bioenergy, photovoltaics, and geothermal energy.

Cleaner Fossil Fuels. The budget request contains $233 million for R&D to develop next-generation technologies for coal combustion with much higher energy efficiency and lower greenhouse gas emissions.

Weatherization & State Energy Grants. The budget request includes $191 million -- a $22 million increase over FY 2000 appropriations -- to deliver energy conservation services to low-income Americans and to assist state energy offices in addressing their energy priorities.

U.S. Global Change Research Program. The FY 2001 request includes over $1.7 billion for scientific research to improve our understanding of human and natural forces that influence the Earth's climate system and to assess the likely consequences of global warming.

SUSTAINABLE ENERGY FOR G-8

KEY POINTS

- As we discussed in our last Sous Sherpa meeting, this topic may have a place as a subcategory of our environmental or development discussions in the G-8.

- the unsustainable use of carbon-based energy sources has potentially grave consequences for the global environment.

- Sustainable energy is a theme that runs throughout U.S. energy, environment, and foreign assistance policy.

    - To accelerate the development and deployment of clean energy technologies around the world, the U.S. Administration has proposed a $200 million initiative, "Clean Energy for the 21st Century." This initiative aims to encourage open competitive markets, remove market barriers to clean energy technologies in developing and transition countries, and provide new incentives for clean energy technology innovation and export.

- We see the sustainable use of energy, particularly the application of energy efficiency, as a win-win proposition: it allows all countries to enjoy growing levels of energy services without increasing energy inputs and polluting outputs.

    - In China, for example, the average thermal efficiency of fossil fuel-fired electricity generating plants is only about 75% of the OECD average. Efforts to improve energy efficiency in China, perhaps through the proposed Clean Development Mechanism, would have benefits for China and globally.

- The United States is actively and positively engaged in the UN Commission on Sustainable Development's work on energy and sustainable development as the CSD prepares for its session devoted to energy issues in 2001.

    - The CSD's Ad Hoc Open-ended Intergovernmental Group of Experts on Energy and Sustainable Development meets March 6-10 ????.

    - We look forward to working with our G-8 colleagues to

assure a CSD outcome that realistically advances global sustainable energy policies.

- The United States promotes the use of renewable energy, energy efficiency, energy conservation, and clean coal technology through our bilateral assistance and technical cooperation programs.

- The US also recognizes that energy sector liberalization can play a positive role in encouraging more efficient use of energy, and has invested considerable resources in our bilateral development program in support of market reforms and regulatory capacity building to ensure that access and environmental issues are adequately addressed.

  • As a function of growing reliance on private capital for energy infrastructure investment, the role of ECA's has become more critical as the role of sovereign lending has declined. Accordingly, the US strongly supports the OECD effort to elaborate environmental guidelines for ECAs.

- The United States believes that the removal of energy subsidies is a key to promoting sustainable energy use. We support the efforts of the international financial institutions to seek the reduction or removal of energy subsidies as part of macroeconomic reform programs. Power sector reform undertaken with IFI assistance should also aim to assure that energy is priced on a cost-recovery basis.

- We supported the World Bank's review of its energy and environment sector policy, but believe that follow-through is needed, in the form of an annual public progress report on implementation of the new strategy.

- We recognize that any efforts undertaken under the Kyoto Protocol will promote the sustainable use of energy and encourage the development and use of renewable energy sources.

If Asked:

- We will be closely watching the World Bank's Prototype Carbon Fund (PCF), which has not yet really begun to operate, to gauge its effectiveness and to ensure it does not prejudice climate change negotiations. We believe the current $150 million funding is adequate to serve its

purposes as a prototype program. We also welcome other initiatives, such as the International Finance Corporation's "Renewable Energy and Energy Efficiency Fund" to encourage clean energy investment.

- We are still reviewing the PPIAF and are interested in seeing how it may support sustainable energy activities. We believe, however, that a good first step in pursuing the objectives of the PPIAF would be to better coordinate existing bilateral donor activities in this arena. One model for such coordination is the "Technology Cooperation Agreement Pilot Project" (TCAPP), a needs-based, country-driven approach to clean energy technology cooperation.

Sustainable Energy for G-8 (Rev 2)
Drafted:EB/ESC/IEC/ENR:S Muller x7-2871 3/7/00
Cleared:OES/EGC:B DeRosa-Joynt - ok
EB/IFD/ODF:E Luftman - ok
E:A Pence - ok

DRAFT ONLY – CLOSE HOLD – DO NOT CITE

[date]

MEMORANDUM FOR
THE SECRETARY OF COMMERCE
THE SECRETARY OF ENERGY
THE SECRETARY OF STATE
THE SECRETARY OF TREASURY
THE UNITED STATES TRADE REPRESENTATIVE
THE ADMINISTRATOR OF THE ENVIRONMENTAL PROTECTION AGENCY
THE ADMINISTRATOR OF THE AGENCY FOR INTERNATIONAL DEVELOPMENT
THE DIRECTOR OF THE TRADE AND DEVELOPMENT AGENCY
THE PRESIDENT OF THE OVERSEAS PRIVATE INVESTMENT CORPORATION
THE PRESIDENT OF THE EXPORT-IMPORT BANK
THE DIRECTOR OF THE OFFICE OF MANAGEMENT AND BUDGET
THE DIRECTOR OF THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

SUBJECT: Promoting Clean Energy Technologies in Developing Countries

Energy use by developing and transition countries is expected to double between 1990 and 2020, and quadruple by 2050, accounting for three-fourths or more of the increase in global energy use by 2050. **[OSTP/DOE -- check #s – do these nos. still work if you extend to transition countries?]** Advanced, efficient, and low-polluting energy technologies can provide the energy services needed in developing countries over the next half-century, sharply reducing emissions of both air pollutants and greenhouse gases. At the same time, these markets offer important opportunities to create new export revenue streams for U.S. companies and high-value U.S. jobs.

Accordingly, it shall be the goal of the United States Government to:

- Coordinate, simplify, and streamline Federal government programs and policies that assist U.S. companies and institutions that seek to export clean energy technologies and services to developing and transition countries, invest in clean energy projects in such countries, and develop markets in such countries for clean energy technologies and services.

- Pursue policies and programs which will result in the doubling of U.S. exports of and investments in clean energy technologies and services to developing and transition countries from the current level of $5 billion to $10 billion by 2005; and,

Consistent with these goals, I hereby direct as follows:

1. There is established a Clean Energy Technology and Trade Working Group (the "Working Group") of the Trade Promotion Coordination Committee (TPCC). The Working Group shall consist of designees of the Secretaries of Commerce and Energy, the Administrator of the Environmental Protection Agency, the Agency for International Development, the Director of the Trade and Development Agency, the Director of the Office of Science and

Technology Policy, and of the Presidents of the Overseas Private Investment Corporation and the Export-Import Bank, and of the heads of other relevant agencies as may be appropriate to further the goals and policies of this memorandum. Designees shall be senior officials who report directly to the agency head (Assistant Secretaries or their equivalent).

(a) The Working Group shall report directly to the Secretary of Commerce, the Secretary of Energy, and the Administrator of the Agency for International Development who, collectively, shall be responsible for oversight of the Working Group.

(b) The Working Group shall prepare annually a report detailing progress towards the goals set forth in this memorandum and outlining the means by which agencies represented in the Working Group will coordinate their policies, programs, and budgets over the coming year to best pursue the policies and goals set forth herein. This report shall be referenced as an element of the annual report on the National Export Strategy prepared by the TPCC and submitted to Congress pursuant to 15 U.S.C. 4727(f) as amended by P.L. 106-158, sec. 7. The Working Group shall also contribute to the annual TPCC budget recommendations memorandum submitted to the Office of Management and Budget.

(c) The Working Group shall serve as the single coordinating forum for relevant federal programs and activities on international clean energy technology promotion and trade, as well as federal research and development efforts supporting such promotion and trade, with a view towards ensuring that federal efforts in each of these areas are consistent and mutually supportive. Accordingly, the Working Group shall incorporate the work and membership of the National Science and Technology Council Working Group on International Energy established by my memorandum of September 15, 1999 to make recommendations on implementation of the report of the President's Committee of Advisers on Science & Technology (PCAST), *Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation.*

2. The Working Group shall, within [120] days of this memorandum, prepare a strategic plan outlining and assessing options for better coordinating their respective agency programs and policies to best fulfill the policies and the goals set forth in this memorandum. This plan shall serve as the basis for the first annual report discussed above.

In preparing this strategic plan, the Working Group shall:

(a) identify key energy technology markets in developing and transition countries in which greater coordination among agency programs and policies could yield substantial, tangible economic and environmental results, building on market studies already completed by existing groups, such as the Environmental Trade Working Group of the TPCC. The plan will focus on countries and regions that offer large opportunities for clean energy technologies, have attractive investment environments, and represent global regional diversity, including, but not limited to, energy markets in Brazil, China, India, Indonesia, and Mexico;

(b) assess ways to simplify and streamline relevant agency programs and policies that assist U.S. companies and institutions seeking to: engage in the export of clean energy technologies and services to developing and transition countries; invest in clean energy projects in such; and/or, stimulate the development of markets in such countries for clean energy technologies and services. Included in this assessment shall be: **[listing of programs – AGENCIES PLEASE CONTRIBUTE; only entry so for (from DOE) is "programs providing technical assistance for regulatory reform"].** The Working Group should explore all reasonable means to ease the use of these programs by prospective clients and stakeholders, including, but not limited to:

(1) establishing a Global Clean Energy Partnership Program to which the relevant agencies would provide resources on a best-efforts basis from within existing appropriations ceilings and planning levels and which would serve as a single point of entry to relevant programs for prospective clients and stakeholders;

(2) developing and employing innovative information technologies, Internet resources, and other "virtual" management and coordination tools to better serve those in the private sector seeking information and assistance and fostering the creation of networks among stakeholders;

(3) facilitating market-based approaches to the transfer of environmentally sound, cost-effective and commercially practicable technologies, practices, and processes that avoid, sequester, control, or reduce anthropogenic emissions of greenhouse gases to developing countries and economies in transition to market-based economies who are Parties to the United Nations Framework Convention on Climate Change.

(c) seek to ensure that the energy technology research and development programs of agencies represented in the Working Group are focused to meet the actual needs of emerging energy markets in developing and transition countries and are coordinated with the policy goals of agency trade and investment promotion programs with respect to such markets;

(d) consider and make recommendations for modifying existing, relevant agency programs in fiscal year 2002;

(e) consider and make recommendations for legislation for modifying these programs or creating new programs and authorities, if needed;

(f) work closely with the Departments of State and Treasury to assess options for engaging broadly with export credit agencies, multilateral development banks and various UN and other international institutions that play key roles in global energy markets to encourage the goals set forth here.

3. The Secretary of Commerce shall work to ensure that the Environmental Technologies Trade Advisory Committee, established under the authority of the Federal Advisory Committee Act, 5 U.S.C. App. 2, provides the Working Group with such information and advice as the Working Group deems useful and necessary in furthering the policies and goals set forth in this memorandum.

WILLIAM J. CLINTON

# # #

International Clean Energy Initiative

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Advanced, low-polluting energy technologies, developed and manufactured in the United States, can provide these energy services efficiently, but existing markets often do not value environmental and efficiency benefits. In addition, environmentally superior options often carry higher up-front costs, may be unfamiliar, or are perceived as more risky by decision-makers in developing countries. The initiative builds on a recent set of recommendations by the President's Committee of Advisors on Science and Technology (PCAST) and is directed at leveling the playing field between cleaner U.S. energy technologies and services and polluting alternatives.

Real Benefits At Home and Abroad. The initiative will help lay the technical and policy foundation that will allow developing and transition countries to build a clean energy future, leapfrogging past the polluting energy technologies used by the industrial countries, while building competitive markets open to U.S. firms. The goals of this initiative include:

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- Reducing methane emissions from pipelines and other fossil sources by an amount equal to as much as 100 million metric tons of carbon per year by 2005.

- Providing technical and policy support to encourage the development of natural gas grids.

- Reducing energy use in the industrial sector through the introduction of best practice methods, including advanced sensors and controls, and energy efficient motor drive systems.

- Conducting research in nuclear energy to address cost, waste, safety, and proliferation concerns.

- Providing technical and policy assistance in support of energy sector reform that creates open, competitive markets while protecting the public interest.

Initiative Structure. This initiative will strengthen efforts to streamline current bureaucratic procedures to better assist U.S. firms wishing to invest in clean energy projects in developing and transition countries. This initiative will also encourage public-private partnerships with foreign counterparts to demonstrate clean energy technologies, drive down their cost, and facilitate private sector financing for their large-scale deployment. The initiative will employ a range of proven policy tools, including U.S. technical and policy assistance to developing countries through personnel exchanges, conducting collaborative R&D with key foreign research groups, developing integrated renewable energy, energy efficiency, and advanced fossil energy technologies and pilot projects, and providing a range of trade supports to expand clean energy exports.

The initiative's requested $100 million increase for these activities includes an additional $46 million for the Department of Energy (DOE); $30 million for the U.S. Agency for International Development; $15 million for the Export-Import Bank; $5 million for the Trade and Development Agency; and $4 million for the Department of Commerce. A $3 million increase in base programs is also requested at DOE, bringing the total increase to $103 million.

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THE WHITE HOUSE

WASHINGTON

April 4, 2000

Mr. Robert G. Bohn
President and Chief Executive Officer
Oshkosh Truck Corporation
2307 Oregon Street
P.O. Box 2566
Oshkosh, WI 54903

Dear Mr. Bohn:

We want to thank you for your Company's important role in defining the charter for the 21st Century Truck Initiative research partnership. This partnership will play a key role in ensuring that freight and passenger services continue to be affordable, safe, and consistent with local and global environmental goals in the years ahead. The technical advances made under this partnership will also help reduce our demand for petroleum and help ensure stable fuel prices in the years ahead.

The enclosed document represents what we believe to be a consensus final draft of the *Statement of Intent* that will be the basis for our work together. While not a formal contract, this paper reflects an understanding between the federal government and a group of eleven creative companies to work together in good faith on a set of ambitious goals.

We particularly want to thank John Stoddart for his contributions. We look forward to meeting with you or your representative in the near future to formally begin work on this critical partnership. If you have any final comments or questions, please contact Henry Kelly at 202-456-6033, hkelly@ostp.eop.gov, or Roger Ballentine at 202-456-1782. Again, thank you for your commitment to this exciting partnership.

Sincerely,

George T. Frampton, Jr.
Acting Chair of Council on
Environmental Quality

Roger S. Ballentine
Deputy Assistant to the President for
Environmental Initiatives

Enclosure

A Declaration of Intent
Twenty-First Century Trucks
Final Version – 22 March 2000

SUMMARY

The United States trucking and supporting industries, are pleased to join with the President on behalf of the Federal government and the Departments of Defense, Energy, and Transportation, and the Environmental Protection Agency in this Declaration of Intent to form a research and development partnership. This partnership will seek to develop and demonstrate commercially viable truck and propulsion systems technology that will dramatically cut the fuel use and emissions of medium and heavy trucks and buses, while enhancing their safety and affordability and maintaining or enhancing performance. These innovations will ensure safe and affordable freight and bus transportation for the nation's economy, ensure the competitiveness of U.S. truck and bus manufacturing facilities, improve our nation's air quality, and reduce U.S. dependence on petroleum fuel.

SHARED VISION

A productive, innovative U.S. trucking and supporting industry is essential for the economic prosperity of every American business. Innovation is also needed to ensure trucking manufacturers and suppliers located in the U.S. remain competitive in world markets and continue to provide rewarding employment opportunities for large numbers of Americans. U.S. manufacturing facilities face stiff worldwide competition. New truck and bus technologies will help truck owners and operators and their customers cut fuel and other operating costs, and increase safety. The Department of Defense, a major owner and operator of trucks, would share these gains and also benefit from reduced logistics costs associated with transporting fuel during operations. The trucking and supporting industries face a range of new challenges: increasingly stringent emissions standards, new concerns about the threat of global warming, concerns about U.S. fuel supplies, increased expectations about safety, and more. The trucking industry's future depends on its ability to produce affordable, high-quality, safe, environmentally sensitive products.

The new challenges can be best met if government, industry, and universities work together to develop an improved generation of commercial trucks for our nation's commercial and military truck fleet. Given adequate support, major advances can be expected in advanced engine designs, stronger, lighter-weight materials, regenerative braking, more efficient power transmission, and alternative fuels.

By this document, the trucking industry and the Federal government declare their separate, but coordinated plans toward the achievement of specific goals to meet the nation's need and desire for tomorrow's cleaner, safer, and more efficient trucks.

PROGRAM GOALS

The program strategy creates a balanced portfolio of research and development to pursue a number of goals simultaneously, while avoiding duplication. The program will develop and demonstrate commercially viable technologies to:

- Improve fuel efficiency,
- Reduce emissions,
- Enhance safety,
- Reduce total owning and operating costs, and
- Maintain or enhance performance.

Making progress in each of these goals simultaneously is a major challenge. The Federal government and the trucking and supporting industries will work actively together to develop a balanced portfolio of research aimed at achieving all of these goals, coordinate their research activities as appropriate, and make effective use of the nation's research universities and national laboratories. Proprietary research agreements between individual companies and federal agencies, which cannot be shared with industrial competitors, will continue to be appropriately funded.

The Federal agencies will build on existing research and assign a high priority to major new research in this area and seek increased funding commensurate with the research required to meet the aggressive goals of the Initiative. Industry will move research achievements into production vehicles rapidly when their commercial viability has been demonstrated. The partnership will work closely with fuel producers to accelerate the development and production of any new fuels required by new engine designs to meet the program goals.

RESEARCH OBJECTIVES

This research partnership will support research aimed at developing production prototype vehicles that achieve all of the following objectives:

(a) Improve Fuel Efficiency of Heavy-Duty Trucks and Buses, specifically:

- Double the Class 8 line haul truck fuel efficiency by 2010 on a ton/miles per gallon basis.
- Triple the Class 2b and 6 truck (delivery van) fuel efficiency by 2010 on a ton/miles per gallon basis.
- Triple the Class 8 transit bus fuel efficiency by 2010 on a ton (passenger)/miles per gallon basis.

(b) Reduce Emissions:

- Exceed standards for oxides of nitrogen, particulate matter, carbon monoxide and hydrocarbons for the year 2010.

(c) Enhance Safety:

- Meet or exceed the motor carrier safety goal of reducing fatalities by half in ten years.
- Improve the crash friendliness of trucks for other road users
- Conduct operation road tests of truck safety improvement components
- Ensure linkages to the Intelligent Vehicle Initiative and the Intelligent Highway System and Infrastructure.

(d) Enhance affordability; Maintain or Enhance performance.

A central goal of this initiative is to develop cost-effective, heavy-duty vehicles for truck operators that are fully competitive in prevailing markets. The program will document vehicle life-cycle-costs through extensive on-road testing and surveys of user responses. Costs considered will include initial vehicle cost, as well as all operating and maintenance expenses – including fuel costs and the value of high reliability.

These program goals and research objectives are aggressive and there is no certainty that they can be achieved. Achieving the goal may also depend on successful introduction of a new fuel and fuel delivery infrastructure compatible with improved truck and bus designs. Fully aware of the magnitude of the challenge and the importance of meeting the partnership's objectives, the parties commit their best efforts to the achievement of the goals of this Declaration of Intent. Industry also commits to the rapid introduction of commercially viable technology developed under the program.

Government and industry will coordinate research and development efforts and share the costs. Federal agencies are likely to cover a larger fraction of research expenses when the work involves longer-term, high-risk research, while the share of industry funding will be greater for research likely to be converted relatively quickly to commercial products.

The Federal government will promote the introduction of innovative truck technologies developed in the initiative through its own purchases of these trucks and buses, and encourage state government and other purchasers to take similar actions.

NEXT STEPS

Within 30 days, a Partnership Coordinating Committee will be formed which will be responsible for coordinating the Partnership's work. It will include senior representatives of the participating industries, and the Departments of Defense, Energy, Transportation, the Environmental Protection Agency, the Office of Science and Technology Policy, the Council on Environmental Quality, the National Partnership for Reinventing Government, and the Office of Management and Budget. Within 120 days, this Committee will:

1. Develop a strategic research and development plan detailing specific program goals and timetables for the ten-year duration of the Initiative.
2. Coordinate and support research and development teams organized around specific research objectives needed to achieve the programs' goals (such as technologies for improving

power-trains, reducing aerodynamic and rolling resistance losses, and reducing vehicle weight). Each team will include both government and industry partners. University participation is encouraged. Competing teams championing different technical approaches to the same program objective will be encouraged when they are appropriate. As technologies move to commercial readiness, some of these partnerships will become research partnerships between individual participating industries and agencies that are not able to share research results with all participants. Provisions will be made to add or remove research projects as needed.

3. Create an overall Cooperative Research and Development Agreement (CRADA) for the partnership and guidelines that will facilitate development and use of CRADAs and other procurement mechanisms such as other transaction agreements involving individual federal agencies and their laboratories.
4. Create an External Advisory Board, acceptable to both industry and the government, consisting of individuals with appropriate expertise in industry, universities, state and local governments, and public interest groups.
5. Establish a peer review process, acceptable to both industry and the government, that assesses technical and program progress.

POTUS PCAST Event

Theme: Administration leading the way to combat global climate change and improve economic opportunity through accelerated technology innovation and international engagement.

- Global energy markets exploding: $100 billion/annum market to meet burgeoning demand in developing countries. This translates into big market potential for competitive US energy technology and development companies.
- But it also poses challenge to global and local environmental quality. If developing countries rely on traditional fossil fuels and current technologies, we will lose the battle to limit greenhouse gas emissions in the coming century.
- This Administration has been leading the way to help developing countries grow without destroying the environment. At the World Bank, with our G-8 partners and through our bilateral programs. But we can and must do more.
- Three years ago, PCAST prepared a roadmap for technology innovation here at home to help meet the challenge of climate change and spur economic growth. Those recommendations formed the basis for our Climate Change Technology Initiative -- $3.6 billion/5 years.
- Today's report prepared by distinguished leaders in business, academia, and science recommends a strengthened partnership between American business and the federal government to engage international markets, to accelerate energy technology innovation and expand global cooperation to meet the needs of developing countries in environmentally sustainable ways.
- This report comes at a time when increasing numbers of businesses are acknowledging the need and the opportunity to accelerate clean energy technologies for economic and environmental gains. {BRT, EEI, Murkowski bill}.
- In spite of the growing consensus on the need -- and opportunity -- for action, Congress has slashed our request for technology innovation under CCTI.
- Today, I would like to issue a dual challenge to the Congress:
  1] fully fund the Administration's request for CCTI; and
  2] support increased efforts to assert American leadership internationally.

<u>Possible Deliverables for PCAST announcement</u>:

- FY2001 funds to implement PCAST recommendations (DOE, USAID)
- OPIC fund
- Environmental Trade Working Group push to double clean energy exports
- EXIM actions
- Creation of NSTC "Strategic Energy Cooperation Initiative"

SCHEDULING PROPOSAL DATE: July 21, 1999

_____ Accept _____ Regret _____ Pending

TO: Stephanie Streett
Assistant to the President and Director of Scheduling

FROM: Neal Lane
Assistant to the President for Science and Technology

George Frampton
Acting Chair, Council on Environmental Quality

Roger Ballentine
Deputy Assistant to the President for Environmental Initiatives

REQUEST: To host a message event on climate change and Congressional budget actions. The President would be briefed by top scientists on compelling new climate change evidence and the new President's Committee of Advisors on Science and Technology (PCAST) report, *Powerful Partnerships: The Federal Role in International Cooperation and Energy Innovation*. Afterward, the President could make a public statement condemning the attacks on his proposed energy R&D budget and other environmental riders in the Congress.

BACKGROUND: Significant cuts in the President's energy efficiency and renewable energy development budget highlight Congress' unwillingness to take the steps necessary to ensure our economic competitiveness and our environmental sustainability. Receiving the PCAST report will emphasize the Administration's commitment to mitigating the effects of climate change while at the same time providing economic opportunity for American business. *Powerful Partnerships* builds upon PCAST's earlier work, which formed the basis for the Administration's Climate Change Technology Initiative (CCTI) in FY 1999 and 2000. This new report highlights the need for the United States to actively engage in energy technology innovation, cooperation and deployment on an international level. PCAST also concludes that strengthening North-South cooperation on clean and advanced energy technologies is a promising approach to securing developing

country participation in an international framework for addressing global climate change – and for helping U.S. businesses increase export markets for their products and expertise.

DATE AND TIME: TBD

DURATION: TBD

LOCATION: Roosevelt Room/Rose Garden

PARTICIPANTS: Neal Lane, George Frampton, Roger Ballentine, John Holdren (Chair of PCAST panel), John Young (Chair of PCAST), Larry Papay (V.P. of Bechtel, Inc.), other industry TBD, Congressional TBD.

OUTLINE: POTUS receives briefing in Roosevelt Room, proceeds to Rose Garden for statement.

REMARKS: Yes

PRESS: Briefing closed press followed by press statement in Rose Garden

RECOMMENDED BY: Neal Lane 67116
George Frampton 65147
Roger Ballentine 61782

STAFF CONTACT: Rosina Bierbaum,
Associate Director for Environment,
Office of Science and Technology Policy, 6-6077

Climate Science Since the Second IPCC Assessment

Since the Second IPCC Assessment, the scientific evidence concerning human influences on the global climate system has continued to accumulate. In particular, recent data and analyses show more persuasively than before that the surface temperature of the Earth is increasing; that this increase can be attributed, in large part, to human-caused increases of greenhouse gases in the atmosphere; and that the continuation of these trends is likely to be associated with climatic changes of forms and degrees capable of adversely affecting large numbers of people. In what follows we elaborate briefly on some of these findings.

Of the 120 to 140 years for which thermometer records are sufficiently complete to define a global average temperature, the 11 warmest years have all occurred since 1983. The three warmest years on record were 1998, 1997, and 1995, in that order.[1]

According to "proxy" temperature records embodied in glaciers and ice sheets, lake sediments, corals, tree rings, and the like, the last 10 years appear to have been the warmest decade (and 1998 appears to have been the warmest year) in the Northern Hemisphere in 1,000 years. Worldwide, the twentieth century has been the warmest in at least the last 500 years.[1]

Greenhouse gases from human activities have emerged as the dominant driver of these global-average temperature increases in the 20th century. While solar variability, volcanic eruptions, and El-Nino cycles also contribute to these global temperature patterns, the 20th century record cannot be explained solely by invoking these phenomena.[1]

The regional patterns of temperature changes across the surface of the Earth and the vertical patterns of temperature changes as one ascends through the atmosphere provide further evidence that what is being observed is human-induced global warming. These patterns are consistent with what is expected under anthropogenic climate change and are inconsistent with hypotheses suggesting that solar variability and/or the urban-heat island effect can be used to explain the instrumental temperature record.[1]

Emerging scientific evidence suggests that we may already be witnessing the impacts of climate change on terrestrial and ocean species and ecosystems. Changes in species distributions and ecosystem dynamics are likely attributable to multiple causes and stresses, but scientists have deduced that climate change is playing a role in the demise of several frog and toad species in Monteverde, shifts in the growing season in Europe, shifts in growth of grass and forb species in Colorado, changes in bird ranges in western Europe, and alterations in patterns of ocean biodiversity.[1f]

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[1] The U.S. National Climate Date Center considers records to be adequate back to about 1880, while the UK Meteorological Office goes back to about 1860. See http://www.ncdc.noaa.gov/ol/climate/research and http://www.meto.gov.uk.

[1] See, e.g., Mann *et al.* (1999) and Pollack *et al.* (1998).

[1] Mann *et al.* (1998).

[1] See Wigley *et al.* (1998), Wentz and Schabel (1998), and Peterson *et al.* (1999).

[1] See Pounds *et al.* (1999), Menzel and Fabian (1999), Alward *et al.* (1999), Parmesan *et al.* (1999), and WWF/MCBI (1999).

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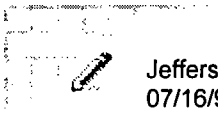

Jefferson B. Seabright
07/16/99 01:06:27 PM

Record Type: Record

To: Ian Bowles/CEQ/EOP@EOP

cc: Roger S. Ballentine/WHO/EOP@EOP
Subject: Holdren/Intl Event

Ian: Thanks for the note. I think a PCAST event is worth doing in context of budget and CCTI -- not so sure we can load it up with World Bank, ECA and corporate principles without confusing the message. I DO think, though, that the work on WB strategy, ECA etc is really very important and we should find a way to articulate as part of an Administration policy push.

I spoke with Tommy Seamans this morning and agree with the direction you are urging on the WB energy strategy. I would aadd that the real test of the Bank's seriousness is their willingness to allocate discretionary resources to grow the pipeline of clean energy loans a la ASTAE. Heretofor they are not keen on doing this and the strategy waffles. Maybe we can push this hard as part of our continuing oversight. I also think we should push them hard to provide info on "externalities" as part of every loan. Even though we do not have a price for carbon, the basic message of the backcasting study was that some of the loans the Bank has been offering in energy are net losers -- a carbon accounting would help the debate move forward.**y**

July 8, 1999

SCHEDULING PROPOSAL

REQUESTED BY: Neal Lane
Assistant to the President for Science and Technology

George Frampton
Chair, Council on Environmental Quality

Roger Ballentine Deputy Assistant to the President
~~Director of Special Projects~~ for Environmental Initiatives

REQUEST: The President hosts a message event on climate change and Congressional budget actions. The President will first be briefed by top scientists on compelling new climate change evidence and the new President's Committee of Advisors on Science and Technology (PCAST) report, *Powerful Partnerships: The Federal Role in International Cooperation and Energy Innovation.* Afterward, the President will make a public statement condemning the attacks on his proposed energy R&D budget and other environmental riders in the Congress.

PURPOSE: This event would provide the President with the opportunity to emphasize the Administration's commitment to developing a clean energy future and safeguarding environmental quality both at home and abroad. The briefing would provide the President with the latest scientific information, and permit him to engage in a dialogue with leading researchers about the implications of new climate change findings for U.S. and international policy making. Additionally, it would highlight the marked differences between his FY 2000 budget and the dramatic anti-environmental riders currently proposed by the Congress.

BACKGROUND: Recent budgetary actions in Congress have jeopardized our ability to effectively engage in prudent and sustainable energy research and development. Massive cuts in his proposed energy efficiency and renewable energy development budgets highlight Congress' unwillingness to take the steps necessary to ensure our economic competitiveness and our environmental sustainability. For example, the Senate has cut the Administration's FY2000

request for renewable energy R&D by roughly a third. In addition, the Senate Foreign Affairs Appropriations Subcommittee reported a bill to slash funding for the Global Environment Facility (GEF) by 80% to $25 million, down from the $143 million Administration request; the Senate Appropriations Committee has cut the President's FY2000 request for energy efficiency activities by about 20%; and the Cochran Amendment has forbidden DOE from spending any money to implement the new EO on energy efficiency recently announced by the President. These actions are undermining U.S. national and global interests and must be reversed.

To help emphasize the Adminstration's commitment to reducing greenhouse gases and mitigate the effects of climate change, the President will receive PCAST's new report, *Powerful Partnerships.*

Powerful Partnerships builds upon PCAST's earlier report, *Federal Energy Research and Development for the Challenges of the Twenty-First Century*, which became the basis for the Administration's Climate Change Technology Initiative (CCTI) in FY 1999 and 2000. It urged development of a broad energy portfolio to secure a prosperous, safe and environmentally sound future and called, in particular, for ramping up the budgets for renewables and efficiency. This new PCAST report, *Powerful Partnerships* builds on the basic assumptions and highlights the need for the United States to actively engage in energy technology innovation, cooperation and deployment on an international level. Because decisions made over the next few years will lock in global energy patterns for decades to come, the time to begin implementation is now. The PCAST also concludes that strengthening North-South cooperation on clean and advanced energy technologies is a promising approach to securing developing country participation in an international framework for addressing global climate change. Together, these reports set an ambitious, yet critical, path for the development of a secure and sustainable and environmentally-sound energy future for the United States.

Over the past year, new information has added considerable evidence that the climate is changing. Four major areas of research would be highlighted:

- Methods that demonstrate that the earth is changing: ice-cores, coral and tree rings.

- Observed impacts of climate change on biodiversity today.
- Analysis of new developments in terrestrial and biological carbon sinks.
- Linkages between climate change, extreme events and El Nino.

These new analyses make the Administration's CCTI proposal all the more urgent.

DATE & TIME: TBD

DURATION: Approximately 1 hour.

LOCATION: Briefing- Roosevelt Room, Message Event- Rose Garden.

PARTICIPANTS: POTUS; Neal Lane, Advisor to the President for Science and Technology; George Frampton, Chair of CEQ; Congressional Invitees to be determined; John Holdren, Chair of the PCAST Panel; John Young, Chair of PCAST ; Larry Papay, VP of Bechtel; Roger Ballentine, ~~Director or Special Projects.~~ Deputy Assistant to the President.

REMARKS: Prepared by Speechwriting and OSTP.

PRESS: Briefing Closed Press; Message Event Open Press.

STAFF CONTACT: Rosina Bierbaum,
Associate Director for Environment,
Office of Science and Technology Policy, 6-6077

Rosina M. Bierbaum 07/08/99 08:03:42 PM

Record Type: Record

To: Roger S. Ballentine/WHO/EOP@EOP

cc:

Subject: Very draft combo of climate science and energy budget event

1. Here's a draft scheduling request (attached)

PCombo.do

and

2. here's some of the things the POTUS could say about the PCAST report:

(POTUS ON PCAST)
I have just been briefed by my Committee of Advisors on Science and Technology (PCAST) on their new report: *Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation*.

Their report notes that the combination of global population and economic growth will create markets for energy technologies totaling about $10 trillion over the next 20 years--more than 80% of this will be outside of the U.S. If our energy technology companies are to survive and prosper, they must be have access to and be competitive in these foreign markets.

U.S. companies, however, face substantial challenges in tapping these markets. Dwindling R&D dollars, aggressive foreign public-private export efforts, tied aid, various trade barriers, the difficulty of identifying and developing the many individually-small and diverse market opportunities, and many other factors, all limit U.S. access. The Federal Government has an important role to play in helping to develop, demonstrate and deploy the energy technologies of the future. These same technologies will also address other pressing global economic, national security, and environmental challenges.

PCAST calls for enhancing our energy R&D portfolio and our intenational cooperative efforts to gain access to the multi-trillion dollar markets of the future.

(CONGRESSIONAL ACTIONS) Yet, Congress is moving in exactly the wrong direction. Massive cuts in his proposed energy efficiency and renewable energy
development budgets highlight Congress' unwillingness to take the steps necessary to ensure our economic competitiveness and our environmental sustainability. For example, the Senate has cut the Administration's FY2000 request for renewable energy R&D by roughly a third. In addition, the Senate Foreign Affairs Appropriations Subcommittee reported a bill to slash funding for the Global Environment Facility (GEF) by 80% to $25 million, down from the $143 million Administration request; the Senate Appropriations Committee has cut the President's FY2000 request for energy efficiency activities by about 20%; and the Cochran Amendment has forbidden DOE from spending any money to implement the new EO on energy efficiency. These actions are undermining U.S. nation al and global interests and must be reversed.

THE WHITE HOUSE

WASHINGTON

June 18, 1999

michelle —
This is doing worth doing
either with
points of
me + Neal
please
follow
up Tod
with
JDP

MEMORANDUM FOR JOHN PODESTA

FROM: NEAL LANE neal

SUBJECT: Release of the PCAST Report on International Energy Technology Innovation

As you recall from our meeting with John Holdren last week, I will soon forward to the President the latest PCAST study (I'm working on a "policymaker's summary" to accompany the transmittal). The heart of the report, *Powerful Partnerships,* is the recommendation that we increase support for U.S. efforts to cooperate in international energy technology innovation. PCAST found that such cooperation provides substantial economic, environmental, and national security benefits to the U.S.

Ironically, Congress this week is taking budget actions that are directly contrary to PCAST's recommendations. For example, the Senate has cut the Administration's request for renewable energy R&D by nearly a third (including prior year balances). In addition, the Senate Foreign Affairs Appropriations Subcommittee reported a bill today to slash funding for the Global Environment Facility (GEF) to $25 million, down from the $143 million Administration request. One of PCAST's major recommendations is to enhance the GEF's role in accelerating the deployment of clean energy technology.

It occurs to me that the transmittal of the PCAST report to the President may be an opportunity to highlight Congress' misguided actions on energy, climate change, and our national security interests in reducing dependence on oil -- perhaps a Roosevelt Room event? I anticipate that the report will be published and available for transmittal in several weeks, which could give us time to schedule flexibly.

If you would like to follow up on this suggestion or need additional background, please call on Rosina Bierbaum, OSTP's Associate Director for Environment (6-6077), while I am out of the country.

Rosina M. Bierbaum 07/15/99 01:52:49 PM

Record Type: Record

To: Roger S. Ballentine/WHO/EOP@EOP

cc:
Subject: EO from PCAST energy report?

Hi Roger---For the potential POTUS energy/budget event, here are some additional possible announcements from the PCAST report. Any clue when it might be (I presume before Congress leaves). And if you want a joint energy report and science briefing? (Lots of the key folks are planning vacations.....) Thanks, Rosina

POWERFUL PARTNERSHIPS:
THE FEDERAL ROLE IN INTERNATIONAL COOPERATION ON ENERGY INNOVATION
Potential Presidential Directives or Executive Orders

A number of PCAST high priority initiatives could be addressed through Executive actions such as Presidential Directives or Executive Orders. These could be bundled into a single EO or in a series broken out by agency, debt relief, the Multilateral Development Banks, and the NSTC, or by other crosscuts.

Energy Sector Restructuring: Countries around the world are restructuring their energy sectors, moving towards competitive markets to increase efficiency and performance. Competitive markets do not, however, adequately address the public interest in: (a) technology innovation (due to the long-term and high-risk nature of much R&D, and the inability of the private sector to fully appropriate the benefits of R&D); (b) addressing environmental and other externalities; and (c) assisting rural areas or the poor. Consequently, mechanisms to advance such public benefits must be built into the reformed energy-sector structure. Actions might include:

- **Direct USAID** officials to work with other countries to incorporate mechanisms in support of public benefits wherever possible and appropriate in their energy-sector restructuring activities.
- Within the **debt relief for the Heavily Indebted Poor Countries initiative**, designate a portion to help initiate Public Benefits Funds in support of innovative clean energy technology development, demonstration, cost buy-down, and deployment (RD3), and to advance other public benefits.
- **Dirct the U.S. representative to the Global Environment Facility** to encourage the establishment within the GEF of a framework for the demonstration (the Demonstration Support Facility) and for the systematic "cost buy-down" through competitive mechanisms (the Clean Energy Technology Obligation) of targeted innovative clean energy technologies.
- **Direct the U.S. Executive Director to the World Bank**, to encourage the incorporation of mechanisms in support of public benefits in World Bank energy sector restructuring activities.

Clean and Efficient Energy Technologies: Clean and efficient energy technologies can often provide energy services at low cost while avoiding or reducing environmental impacts, oil-security risks, and other problems associated with conventional energy supply. The development and use of these clean and efficient technologies is frequently limited by: higher transaction costs; higher up-front costs (even with lower life-cycle costs); market fragmentation; lack of familiarity with the technology; and others. Actions might include:

- **Direct USAID** to support clean and efficient energy technologies wherever possible and appropriate.
- **Direct the U.S. Executive Director to the World Bank** to encourage the transition from subsidizing conventional energy technologies—which the private sector can support in a restructured energy sector—to supporting clean energy technologies that provide public benefits, such as energy efficient or renewable energy technologies; and to develop mechanisms for extending retail finance for these technologies.
- **Direct the U.S. Treasury to develop a tax package** in support of U.S. firms demonstrating clean and efficient energy technologies in international markets.

Strategic Management: To fully realize the potential of international cooperation on energy RD3, it is necessary to develop a strategic vision of the opportunities and goals; to clearly define programs to achieve those goals; to systematically develop effective partnerships to do the work; to coordinate across agencies to take advantage of their synergies; to closely link activities with the private sector; to review/evaluate programs; and to make a long-term commitment to build and maintain strong international cooperative energy programs. To accomplish this, actions might include:

- **Create an NSTC Working Group** with representatives from each of the primary agencies associated with international energy RD3; and establish an external Advisory Board to this Working Group. Direct this working group to conduct a portfolio assessment of energy RD3 needs (building on the work of PCAST) and to work with the agencies on internal and external program monitoring and evaluation.
- **Direct each agency** to identify clear and accountable management chains for international energy RD3; and to develop plans for how they are going to strengthen their international energy RD3 capabilities through training, targeted hiring, and the rotation of staff—such as from the national laboratories—into the agency.
- **Direct each agency** to work with the NSTC working group to develop budget proposals for the 2001 budget and to identify means of supporting multiyear commitments.

Powerful Partnerships: The Federal Role in International Cooperation On Energy Innovation

A Report from the President's Committee of Advisors on Science and Technology
Panel on International Cooperation in Energy Research, Development, Demonstration, and Deployment

June 1999

Questions about Findings and Recommendations

Why is it in the interest of the United States to support energy technology development in the rest of the world?

Global energy development and innovation benefits the United States by:

- Reducing domestic and international dependence on oil;
- Improving the safety of nuclear plants and reducing nuclear proliferation risks;
- Reducing global air pollution and greenhouse gases; and
- Enhancing political and economic stability that encourages trade.

How does international cooperation help American firms?

International energy cooperation gives U.S. companies access to the best innovative ideas in the world as well as experience with and access to the fast-growing, multi-hundred billion dollar per year global energy technology market.

Why can't we leave international energy cooperation entirely to the private sector?

The private sector plays the major role in energy innovation and related international cooperation, but there are significant public benefits – like reduced pollution, increased energy security, long-term technology innovation, and developmental equity issues – that are unlikely to be adequately captured by private sector investment alone. Limited, short-term government activities that build on private sector investment and focus on filling gaps can achieve significant benefits for the U.S.

What does PCAST recommend?

PCAST identifies three areas for focused government programs:

- Building markets for energy technology innovation through capacity building, energy-sector reform, clean energy technology demonstration and cost-buy-down programs, and financing;
- Promoting technologies for increased efficiency of energy end-use, particularly in buildings and appliances, small vehicles and buses, energy-intensive industries, and co-generation of

electricity; and

- Promoting technologies for a cleaner and more efficient energy supply, with emphasis on biomass and other renewable energy sources, fossil-fuel decarbonization and carbon storage technologies, and nuclear fission and fusion.

Aren't there already federal programs that do these things?

DOE, USAID and several other agencies spend about $250 million a year in support of international cooperation on energy innovation. While these programs are generally effective, they simply are not adequate in scope and scale to meet the challenges and opportunities presented by the international energy arena. In particular, the agencies have few programs to bridge the gap between R&D and commercial deployment, a problem that is substantially slowing the pace of energy innovation. PCAST recommends doubling the present level of investment in FY 2001, and increasing funding to $750 million by FY 2005.

Why now?

The energy choices being made now and over the next twenty years will substantially shape the character of the global energy system for much of the next century. Energy sector reforms taking place today all over the world will lock in the characteristics of those energy markets for decades to come. To be available for deployment in twenty years, investments must be made in new energy technologies now. Modest investments made now could have enormous leverage in creating a world energy future that is more secure, more resilient, less costly, and less polluting.

How would this program be managed?

PCAST recommends the establishment of a working group under the National Science and Technology Council to guide and coordinate interagency efforts, with advice from an advisory board with representation from private, NGO, and academic sectors.

POWERFUL PARTNERSHIPS: THE FEDERAL ROLE IN INTERNATIONAL COOPERATION ON ENERGY INNOVATION

A Report by the President's Committee on Science and Technology Panel on International Cooperation in Energy Research, Development, Demonstration, and Deployment

June 1999

Response to Congressional Concerns

Congressional Concern: International Energy RD[3] is...	This Panel's Findings ...
poorly managed by Executive Branch agencies, wasting taxpayer dollars;	We identified a number of well-managed programs and some that were less well managed. In general, the biggest management problems are lack of an overarching strategic vision and insufficient coordination of programs within and across agencies to meet that vision (although there is substantial agency effort to coordinate). The responsibility for these shortcomings is shared by the Executive Branch, which has not tried to implement an overarching vision, and the Congress, whose opposition to cooperation has helped deter the Executive Branch from articulating one. In any case, the high rates of return to R&D and the substantial economic benefits of cooperating on it make it unlikely that these programs have been money wasters.
a giveaway to other countries;	Most international cooperation on ERD[3] serves U.S. economic, environmental, and security interests. In economic terms, it provides the United States with access to sources of innovation elsewhere as well as access for U.S. technologies to overseas markets that are often larger than our own.
corporate welfare;	The possibility of inappropriately subsidizing corporate activity is a risk that must be monitored. In general, however, Federal support for international energy RD[3] augments private investments in the innovation pipeline appropriately in order to gain public benefits in excess of private returns. Assistance to U.S. companies in overcoming barriers to successful deployment of innovative technologies in foreign markets may bring environmental and security benefits to U.S. citizens as well as benefiting the U.S. economy.
undercutting U.S. companies with loss of intellectual property;	Intellectual property issues are always a concern and require ongoing attention. Partners in U.S. international ERD[3] cooperation should be signatories to international protocols on copyright and patent rights, and the U.S. Government should ensure that broad umbrella agreements are in place and specific intellectual property rights are defined in all programs and projects.
a source of junkets for government bureaucrats;	Those who do this kind of work, particularly in developing countries, can attest to the long hours, difficult working and living conditions, frequent illness, and long periods away from home and family. These activities are rarely junkets.
back-door implementation of the Kyoto protocol.	International ERD[3] cooperation brings many benefits to the United States besides reducing the risks of climate change. In relation to climate, moreover, the Kyoto Protocol is about targets and timetables for reductions in greenhouse-gas emissions out to 2012, while ERD[3] cooperation commits no one to any specific targets or timetables but positions everyone to reduce emissions more cost effectively to any targets/timetables eventually agreed upon.

Table ES-1: INITIATIVES AND BUDGETS

(Budget in $Millions of Supplemental Spending Above Current Agency or PCAST 97 Levels)

Initiative	FOUNDATIONS OF ENERGY INNOVATION	FY01	FY05	Page
Capacity Building	--Increase support for regional centers of ERD[3] --Expand existing and develop new training programs on energy --(Interdisciplinary research—monitoring/evaluation/institutional change)*	$20 M	$40 M	3-10 3-15
Energy Sector Reform	--Technical/policy assistance for sector reform that gets "prices right," including externalities, and advances public benefits --Assistance establishing evolutionary regulatory frameworks for gas grids	20	40	3-19
Demonstration And Buydown	--Encourage development of a Demonstration Support Facility --Award production tax credits for demonstrations that meet criteria --Assist in establishing a Clean Energy Technology Obligation	40	80	3-26
Finance	--Encourage MDBs to increase financing for clean/efficient energy technology; support activities with trust funds for using US experts --Facilitate market-based finance of clean/efficient energy technologies, including creating a fund administered by OPIC --(Technical, Financial, and Feasibility Analysis Assistance for US Firms)*	40	80	3-33 3-37
	A PORTFOLIO OF ENERGY EFFICIENCY RD[3]			
Buildings	--Technical/policy assistance to develop/adopt efficiency standards, ratings, labeling of building equipment; assist testing programs, etc. --Testing/policy assistance to develop/apply building design tools/design competitions/energy codes/standards for new buildings; training; etc. --Encourage MDBs/GEF to support building/equipment efficiency --(Develop/Disseminate Improved Cookstoves)*	20	40	4-11 4-15
Transport	--ntegrate/expand RD[3] on low-cost, efficient, clean power for vehicles --Encourage GEF/MDBs to help finance production/use of clean vehicles --Assist in analysis/implementation of vehicle emissions testing/standards --(New Technologies for Public Transport Systems)*	20	40	4-19 4-22
Industry	--U.S. Public/private/foreign cooperation to develop technology roadmaps for energy-efficient processing of energy-intensive materials --Cooperative development/implementation of technology roadmaps --Support for joint-venture creation, licensing, between U.S. firms/partners	10	20	4-28
Combined Heat and Power (CHP)	--Public/private U.S./foreign cooperation on information programs, etc. --Collaborative assessments of potential CHP sites, address regulatory and market barriers, attract funding for demonstrations, help secure finance --Support reforms to "level the playing field" for CHP and U.S. equipment	10	20	4-30
	A PORTFOLIO OF ENERGY SUPPLY RD[3]			
Widespread Renewables	--RD[3] on industrial-scale biomass power/coproducts; restore degraded land --Develop integrated renewable/hybrid systems for rural areas --Accelerate deployment of grid-connected intermittent/hybrid systems --Assess renewable energy resources by region --(RD[3] on solar thermal electric; support strong domestic RD[3] efforts)*	40	80	5-12 5-14
Fossil Fuel	--Promote energy/environment reforms in support of coproduct strategies --RD&D on low-cost hydrogen production and byproduct carbon recovery --Carbon sequestration standards/regional assessments/ reservoir analyses --(R&D to exploit energy of methane hydrates in climate-friendly ways)*	20	40	5-21 5-23
Nuclear Energy	--Add international component to Nuclear Energy Research Initiative --Expand/strengthen international studies of spent fuel/high-level waste --Pursue new international agreement on fusion R&D --(Improve safety and security of nuclear facilities worldwide)*	10	20	5-27 5-29
	A SET OF MANAGEMENT RECOMMENDATIONS			
Agency Management	Establish NSTC working group (WG) on Strategic Energy Cooperation --NSTC WG would have interagency secretariat/external Advisory Board --would assess IERD[3] portfolio, guide/coordinate agency programs --strengthen agency internal/external review capabilities --Agencies to use competitive solicitations to identify best approaches --Agencies identify accountable management chains with authority/budgets --strengthen agency international capabilities by training/detailing staff --Establish Strategic Energy Cooperation Fund			6-13 6-15
TOTAL		250	500	

* Initiatives in parentheses are described in the chapters but not in the Executive Summary; budget totals include these initiatives.

POWERFUL PARTNERSHIPS:
THE FEDERAL ROLE IN INTERNATIONAL COOPERATION ON ENERGY INNOVATION
Potential Presidential Directives or Executive Orders

A number of PCAST high priority initiatives could be addressed through Executive actions such as Presidential Directives or Executive Orders. These could be bundled into a single EO or in a series broken out by agency, debt relief, the Multilateral Development Banks, and the NSTC, or by other crosscuts.

Energy Sector Restructuring: Countries around the world are restructuring their energy sectors, moving towards competitive markets to increase efficiency and performance. Competitive markets do not, however, adequately address the public interest in: (a) technology innovation (due to the long-term and high-risk nature of much R&D, and the inability of the private sector to fully appropriate the benefits of R&D); (b) addressing environmental and other externalities; and (c) assisting rural areas or the poor. Consequently, mechanisms to advance such public benefits must be built into the reformed energy-sector structure. Actions might include:

- **Direct USAID** officials to work with other countries to incorporate mechanisms in support of public benefits wherever possible and appropriate in their energy-sector restructuring activities.
- Within the **debt relief for the Heavily Indebted Poor Countries initiative**, designate a portion to help initiate Public Benefits Funds in support of innovative clean energy technology development, demonstration, cost buy-down, and deployment (RD^3), and to advance other public benefits.
- **Direct the U.S. representative to the Global Environment Facility** to encourage the establishment within the GEF of a framework for the demonstration (the Demonstration Support Facility) and for the systematic "cost buy-down" through competitive mechanisms (the Clean Energy Technology Obligation) of targeted innovative clean energy technologies.
- **Direct the U.S. Executive Director to the World Bank**, to encourage the incorporation of mechanisms in support of public benefits in World Bank energy sector restructuring activities.

Clean and Efficient Energy Technologies: Clean and efficient energy technologies can often provide energy services at low cost while avoiding or reducing environmental impacts, oil-security risks, and other problems associated with conventional energy supply. The development and use of these clean and efficient technologies is frequently limited by: higher transaction costs; higher up-front costs (even with lower life-cycle costs); market fragmentation; lack of familiarity with the technology; and others. Actions might include:

- **Direct USAID** to support clean and efficient energy technologies wherever possible and appropriate.
- **Direct the U.S. Executive Director to the World Bank** to encourage the transition from subsidizing conventional energy technologies—which the private sector can support in a restructured energy sector—to supporting clean energy technologies that provide public benefits, such as energy efficient or renewable energy technologies; and to develop mechanisms for extending retail finance for these technologies.
- **Direct the U.S. Treasury to develop a tax package** in support of U.S. firms demonstrating clean and efficient energy technologies in international markets.

Strategic Management: To fully realize the potential of international cooperation on energy RD^3, it is necessary to develop a strategic vision of the opportunities and goals; to clearly define programs to achieve those goals; to systematically develop effective partnerships to do the work; to coordinate across agencies to take advantage of their synergies; to closely link activities with the private sector; to review/evaluate programs; and to make a long-term commitment to build and maintain strong international cooperative energy programs. To accomplish this, actions might include:

- **Create an NSTC Working Group** with representatives from each of the primary agencies associated with international energy RD^3; and establish an external Advisory Board to this Working Group. Direct this working group to conduct a portfolio assessment of energy RD^3 needs (building on the work of PCAST) and to work with the agencies on internal and external program monitoring and evaluation.
- **Direct each agency** to identify clear and accountable management chains for international energy RD^3; and to develop plans for how they are going to strengthen their international energy RD^3 capabilities through training, targeted hiring, and the rotation of staff—such as from the national laboratories—into the agency.
- **Direct each agency** to work with the NSTC working group to develop budget proposals for the 2001 budget and to identify means of supporting multiyear commitments.

number of scientists were waiting to see how the debate plays out before agreeing to take jobs with the project.

DOE officials, according to Krebs, are confident that the department's recent appointment of David Moncton as SNS project director will assist the recruitment process. Moncton is an Argonne National Laboratory manager credited with efficient construction of that facility's Advanced Photon Source. "I think his commitment to the project has played a positive role in getting other people to join," she said.

DOE also appears to be on track in preparing a new memorandum of agreement involving the five department labs working on SNS, Krebs said. Officials completed a draft document in May and expect a final version to be ready in July.

Sensenbrenner in his March report expressed concern that the intricate lab arrangement would interfere with Moncton's ability to run the project. "Until the MOA is legally binding, Dr. Moncton won't have sufficient authority over [SNS] employees," the chairman said. — *Tarun Reddy*

PCAST URGES DOUBLED INVESTMENT IN OVERSEAS ENERGY COLLABORATIONS

A presidential advisory panel last week urged the government to more than double by 2001 its financial support for international energy research collaborations that could help the United States and other nations meet energy, environmental and other needs.

Called "Powerful Partnerships: The Federal Role in International Cooperation on Energy Innovation," the report calls such collaborations all the more urgent and warns that time is running out to launch research necessary for critical energy and environmental technologies over the next 100 years.

"The costs and risks are modest in relation to the potential gains," the report said. "Now is the time for the United States to take the sensible and affordable steps outlined here to address the international dimensions of the energy challenges to U.S. interests and values that the 21st Century will present."

The report, prepared by the President's Committee of Advisors on Science and Technology, says federal spending on international energy research, development, demonstration and deployment should increase from $235 million in FY-97, the last year cited in the study, to $485 million in FY-01 and $735 million in FY-05. John Holdren, a PCAST member and a Harvard University professor who headed the review, presented the findings to the council on Monday.

The report maintains the United States and the world face "an historic window of opportunity" in energy research. Energy-industry restructuring and regulatory reforms now under way will be completed over the next 10 years, locking in mechanisms that will influence financing and other decisions on energy projects for "the next century and even beyond," the report says.

"The time requirements for moving new technologies through the innovation pipeline mean that much of the research intended to affect deployments in the 2020s, 2030s, and 2040s needs to be underway in the next decade," the report says. "And the long service lifetimes of most energy-supply technologies and much of the equipment and infrastructure governing energy end-use efficiency means that much of what is deployed in the 2020s, 2030s, and 2040s will still be in place toward the end of the next century."

The "globalization of innovation capacities" combined with "tightening constraints" on r&d spending by the U.S. government and private sector make international research partnerships that much more attractive to the nation, the report says. Such efforts also enhance U.S. companies' access to foreign markets, it adds.

"Though significant and often effective," U.S. support for international energy research is still "insufficient in relation to the challenges and opportunities" that exist, the report finds. It refers to a study by RAND that indicates the government spent $235 million on such activities in FY-97, more than half of it on fusion and fission energy.

The agencies involved in that research — DOE, the Nuclear Regulatory Commission, the Environmental Protection Agency and the Agency for International Development — did not adequately coordinate with each other and with other federal agencies engaged in financing the deployment of technology, such as the Export-Import Bank and the Overseas Private Investment Corp., the report says. DOE was responsible for 57% of the U.S. funding, Holdren added.

The report offers a number of recommendations, including more financial support for energy research, development, demonstration and deployment that will benefit buildings, transportation and industry; improved planning for the energy and environmental needs of developing nations; technical assistance to help other nations implement regulations that compliment changing energy markets; and tax credits and other financial incentives for promising technologies.

The report would also set up a working group under the White House's National Science and Technology Council to coordinate international energy research activities across the federal government.

POWERFUL PARTNERSHIPS: THE FEDERAL ROLE IN INTERNATIONAL COOPERATION ON ENERGY INNOVATION

A Report from the President's Committee of Advisors on Science and Technology
Panel on International Cooperation in Energy Research, Development, Demonstration, and Deployment

June 1999

Questions about Findings and Recommendations

Why is it in the interest of the United States to support energy technology development in the rest of the world?

Global energy development and innovation benefits the United States by:

- Reducing domestic and international dependence on oil;
- Improving the safety of nuclear plants and reducing nuclear proliferation risks;
- Reducing global air pollution and greenhouse gases; and
- Enhancing political and economic stability that encourages trade.

How does international cooperation help American firms?

International energy cooperation gives U.S. companies access to the best innovative ideas in the world as well as experience with and access to the fast-growing, multi-hundred billion dollar per year global energy technology market.

Why can't we leave international energy cooperation entirely to the private sector?

The private sector plays the major role in energy innovation and related international cooperation, but there are significant public benefits – like reduced pollution, increased energy security, long-term technology innovation, and developmental equity issues – that are unlikely to be adequately captured by private sector investment alone. Limited, short-term government activities that build on private sector investment and focus on filling gaps can achieve significant benefits for the U.S.

What does PCAST recommend?

PCAST identifies three areas for focused government programs:

- Building markets for energy technology innovation through capacity building, energy-sector reform, clean energy technology demonstration and cost-buy-down programs, and financing;
- Promoting technologies for increased efficiency of energy end-use, particularly in buildings and appliances, small vehicles and buses, energy-intensive industries, and co-generation of electricity; and

- Promoting technologies for a cleaner and more efficient energy supply, with emphasis on biomass and other renewable energy sources, fossil-fuel decarbonization and carbon storage technologies, and nuclear fission and fusion.

Aren't there already federal programs that do these things?

DOE, USAID and several other agencies spend about $250 million a year in support of international cooperation on energy innovation. While these programs are generally effective, they simply are not adequate in scope and scale to meet the challenges and opportunities presented by the international energy arena. In particular, the agencies have few programs to bridge the gap between R&D and commercial deployment, a problem that is substantially slowing the pace of energy innovation. PCAST recommends doubling the present level of investment in FY 2001, and increasing funding to $750 million by FY 2005.

Why now?

The energy choices being made now and over the next twenty years will substantially shape the character of the global energy system for much of the next century. Energy sector reforms taking place today all over the world will lock in the characteristics of those energy markets for decades to come. To be available for deployment in twenty years, investments must be made in new energy technologies now. Modest investments made now could have enormous leverage in creating a world energy future that is more secure, more resilient, less costly, and less polluting.

How would this program be managed?

PCAST recommends the establishment of a working group under the National Science and Technology Council to guide and coordinate interagency efforts, with advice from an advisory board with representation from private, NGO, and academic sectors.

President's Committee of Advisors
on Science and Technology

The Federal Role in International Cooperation on Energy Innovation

John Holdren
Chair

PCAST 97
Federal Energy Research and Development for the Challenges of the Twenty-First Century

- *"The Panel recommends that the government and government/ national-laboratory/industry/university consortia should engage strongly in international energy technology R&D and demonstration and commercialization efforts to regain and/or maintain the scientific, technical, and market leadership of the United States in energy technology. This should include increased R&D— particularly in collaboration with developing countries, temporary support for demonstration and commercialization activities where appropriate, and responses to foreign export promotion activities where necessary."*

September 30, 1997

PCAST CoChair John Young letter to President Clinton

- *.... "Robust and comprehensive international cooperation among industrial, transition, and developing countries in research and development on advanced energy technologies could serve as the cornerstone of such a collaborative framework. This could provide the basis for delivering the increased quantities of affordable energy that meeting the economic aspirations of the developing countries will require, while simultaneously reducing their greenhouse-gas emissions."*

May 15, 1998

President Clinton
letter to PCAST Co-Chair John Young

"I want to thank the President's Committee of Advisors on Science and Technology (PCAST) for highlighting the issue of international cooperation in Energy R&D. In response to your recommendations, I have asked my Science Advisor, Neal Lane, to work with the National Science and Technology Council (NSTC) agencies, industry, universities, other organizations, and with PCAST to review the U.S. international energy R&D portfolio and to report to me by May 1, 1999, on ways to improve the U.S. program of international cooperation on energy R&D to best support our nation's priorities and address the key global energy and environmental challenges of the next century."

July 23, 1998

The President's Science Advisor Neal Lane Letter to John Holdren

"Given the President's request ... I request that your International Energy R&D Panel specifically address the following issues."

Challenges. Identify the key energy-linked challenges.

U.S. Experience. Provide a synopsis of international energy R&D.

Foreign and Multilateral Public and Private Experience. Review foreign bilateral and multilateral public/private IERD^3.

R&D Opportunities. Identify important IERD^3 opportunities.

Deployment. Identify innovative mechanisms for large-scale market-driven deployment of advanced energy technologies.

Strategic Framework. Develop a strategic framework and action agenda.

September 9, 1998

President's Committee of Advisors on Science and Technology

PANEL ON THE FEDERAL ROLE IN INTERNATIONAL COOPERATION ON ENERGY INNOVATION

John P. Holdren, Professor of Environmental Policy, Harvard University (Chair)

Richard Balzhiser, President Emeritus, Electric Power Research Institute

John Boright, Exec Director, Offc of International Affairs, National Research Council

Bill Chandler, Director, Advanced International Studies, Battelle Laboratory

John Deutch, Institute Professor of Chemistry, MIT

Howard Geller, Exec Director, American Council for an Energy-Efficient Economy

John H. Gibbons, former Science & Technology Advisor to the President

Larry Papay, Senior Vice President for Research, Bechtel Corporation

Nathan Rosenberg, Professor of Economics, Stanford University

Maxine Savitz, General Manager, Allied Signal Ceramic Components

Bruce Stram, Vice President for Business Development, Enron Energy Services

Bob Williams, Sr Scientist, Energy & Environmental Studies, Princeton University

Lilian Shiao-yen Wu, Research Scientist, IBM Corporation

John Young, PCAST Co-Chair and former CEO, Hewlett-Packard Corp

Sam Baldwin, Study Executive Director, OSTP

Paul de Sa, Assistant to the Chair, Harvard University

Ann Kinzig, OSTP Staff

Martin Offutt, OSTP Staff

RATIONALE FOR U.S. PARTICIPATION IN INTERNATIONAL ENERGY-TECHNOLOGY COOPERATION

ACCELERATING ENERGY INNOVATION EVERYWHERE BENEFITS THE UNITED STATES BY...

- reducing pressure on world oil supplies and the associated economic & political risks;
- improving nuclear energy systems on whose safety and proliferation resistance the whole world depends;
- reducing other countries' contributions to globe-girdling air pollution and greenhouse gases;
- providing the energy basis for politically stabilizing & trade-enhancing sustainable economic development.

U.S. PARTICIPATION IN INTERNATIONAL COOPERATION TO THESE ENDS ALSO...

- enhances U.S. access to increasingly global sources of innovation, increasing the pace & lowering the cost of innovation for U.S. applications;
- brings U.S. firms access to and understanding of the large foreign markets for energy technologies;
- provides a *quid pro quo* for developing country agreement to greenhouse-gas reductions below "business as usual".

PCAST INTERNATIONAL ENERGY PANEL

THE ROLE & NATURE OF GOVERNMENT INVOLVEMENT

The private sector plays a large and growing role in energy-technology innovation and international cooperation relating to it.

A need remains for government involvement because the public interest in energy outcomes goes beyond the sum of perceived private interests (extending to externalities, public goods, meeting the needs of the poor, etc.).

Government interventions should...

- be structured to encourage, complement, and catalyze private-sector activities;
- address specific shortfalls in the private sector's incentives & capacities to address society's interest in energy innovation;
- be limited in size and duration, with provision for terminating unsuccessful projects & handing off successful ones.

Government participation can include participation in, funding for, and other encouragement of cooperative efforts in...

- conduct of fundamental and applied energy R&D;
- demonstration & niche deployment of promising technologies;
- shaping the deployment environment to reflect public benefits;
- capacity building, integrated assessment, and institutional innovation in support of these approaches.

THE FEDERAL ROLE IN INTERNATIONAL COOPERATION ON ENERGY INNOVATION

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1. **U.S. interests and government roles in international cooperation on energy research, development, demonstration, and deployment (ERD^3)**: rationales and roles for US participation in international cooperation on ERD^3 in light of U.S. interests and values; specific benefits of high-innovation vs. low-innovation futures.

2. **The international landscape of ERD^3**: current picture and recent trends in domestic & international ERD^3 efforts by governments, firms, NGOs, and multilateral organizations; inadequacy of existing efforts.

3. **Foundations of international cooperation on energy innovation**: analysis and recommendations concerning capacity building for ERD^3 in the United States, partner countries, and multinational institutions; cooperation in energy-sector reform to attract private capital while preserving public benefits; facilitating financing of innovative energy technologies.

4. **Opportunities for cooperation on efficient end-use technologies**: high-leverage initiatives to increase efficiency in buildings, energy-intensive industries, and vehicles, as well as with combined heat and power.

5. **Opportunities for cooperation on energy-supply technologies**: high-leverage initiatives to accelerate RD^3 of biomass and other renewables, as well as fossil-fuel decarbonization and sequestration; cooperative research to address problems of fission, develop fusion.

6. **Portfolio assessment, partnering, and program management**: criteria for assessing the cooperative ERD^3 portfolio; considerations in forming partnerships; mechanisms and institutions for management, coordination, & evaluation of Federal cooperative ERD^3 efforts.

Figure 2.4: U.S. collaborative ERD3 projects by agency expenditure, FY 1997. Total is approximately $235 million. Source: RAND.

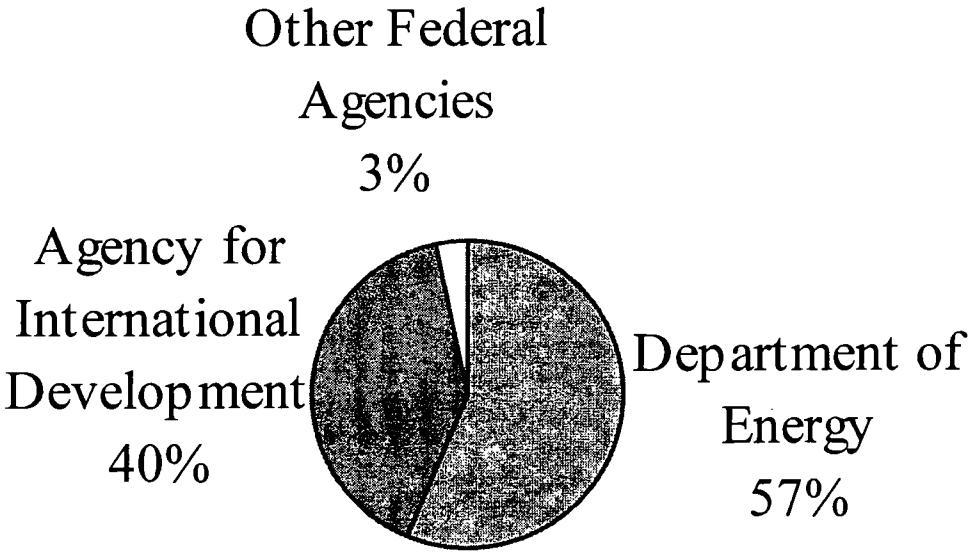
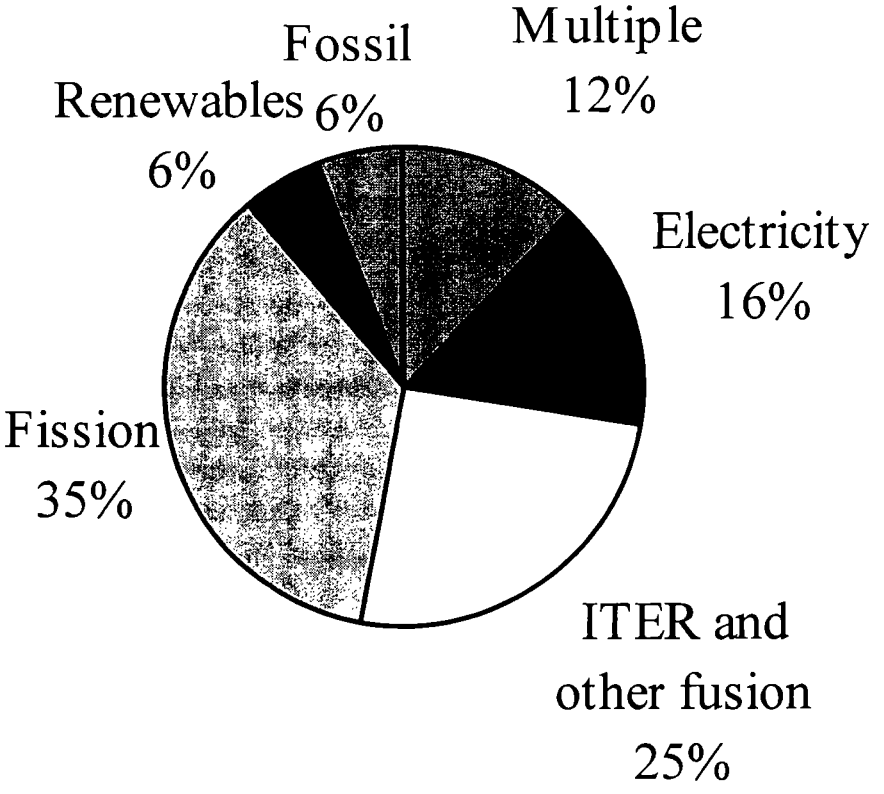
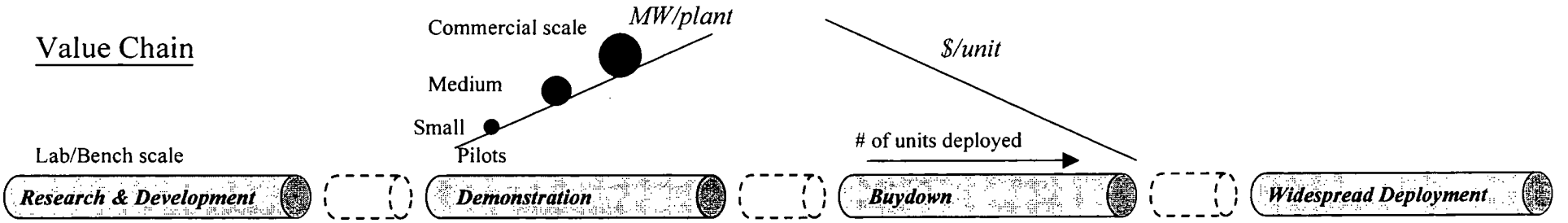


Figure 2.6: U.S. collaborative ERD3 projects by area, FY 1997. Source: RAND.

(total ~$235M)



Value Chain



Existing Participants, Institutions, and Mechanisms

DoE

USAID

U.S. Trade Agencies

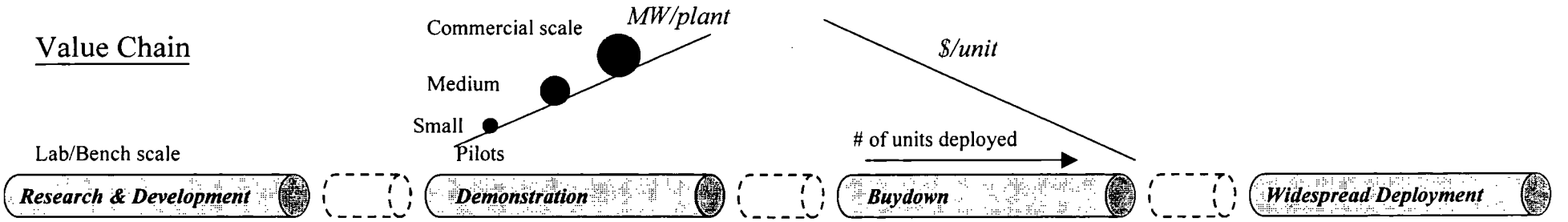
GEF

Multilateral Dev't Banks

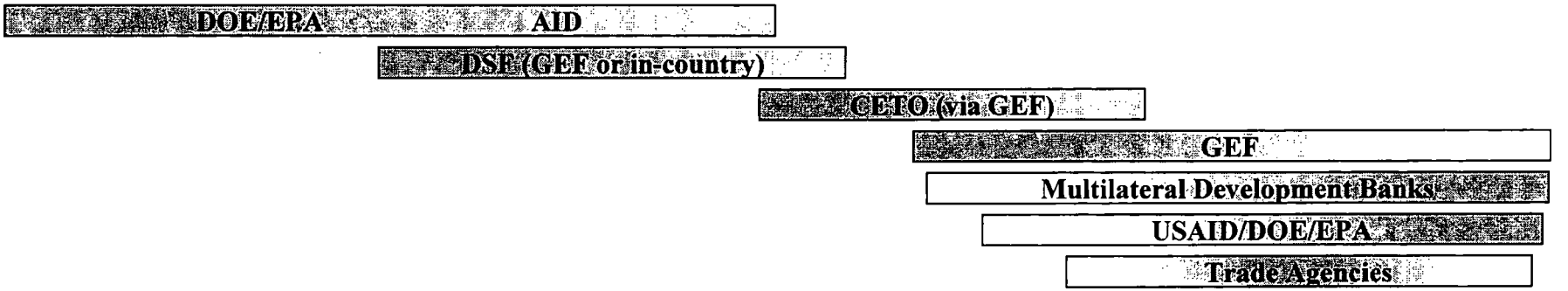
Foundations of Energy-Technology Innovation

- Capacity Building
  - Increased support for existing/new regional RD^3 centers
  - Expand existing/develop new training programs
  - (Interdisciplinary Research--monitoring/evaluation/institutional change)
- Energy Sector Reform
  - Technical/policy advice to 'get prices right'; advance public benefits
  - Assistance in establishing evolutionary regulatory frameworks for gas
  - (PBF for Debt Swap, IRP/DSM, Rural Energy Concessions, other)
- Demonstration and Cost Buydown Mechanisms
  - Demonstration Support Facility, preferably through GEF; production tax credits
  - Clean Energy Technology Obligation, preferably through GEF
- Finance
  - MDB transition to clean energy technologies; provide them technical assistance
  - OPIC financing of energy efficiency and renewable energy projects
  - (Technical/financial/feasibility analysis assistance to US firms)

Value Chain



Proposals for "filling the gaps"



Efficient End-Use Technologies

- Buildings
  - Assistance on equipment/appliance standards, ratings, labeling, testing
  - Assistance on building design tools/design competitions/codes/standards
  - Encourage GEF, MDBs to support building/equipment energy efficiency
  - (Develop/disseminate improved cookstoves)
- Vehicles
  - Efficient small vehicle and bus RD^3: hybrids, fuels cells, electric, alt. fuels
  - Encouragement of GEF/MDBs to support clean, efficient vehicle deployment
  - Analysis and implementation of vehicle emissions testing/standards
  - (Innovative public transit and land use planning)
- Industry
  - U.S. industry-foreign partnerships to develop/implement technology roadmaps; support joint ventures in energy intensive materials processing.
- Combined Heat and Power
  - Information, training, site assessment, demonstrations, policy reform for deployment of CHP

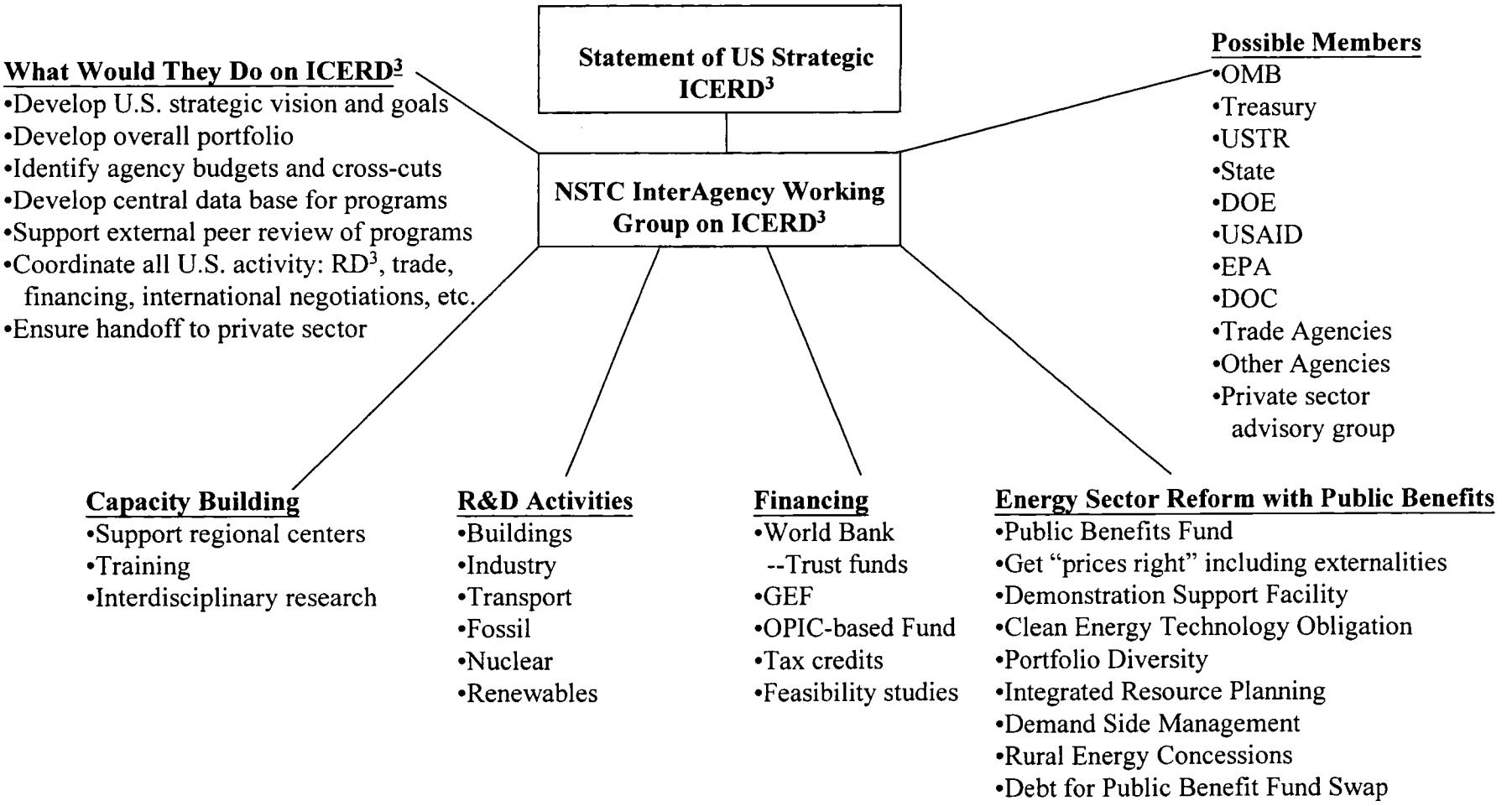
Energy Supply

- Renewables
  - RD^3 on industrial scale biomass w/coproducts; restoration of degraded lands
  - RD^3 on integrated renewable/hybrid systems for rural areas
  - RD^3 on grid-connected intermittent RETs/Hybrids
  - Resource assessment
  - (Solar thermal electric. Support strong domestic RD^3 programs)
- Fossil
  - Promote energy-sector and environmental reforms to encourage coproducts
  - RD^3 on hydrogen from fossil with carbon sequestration
  - Carbon sequestration RD^3: standards/regional assessments/reservoir analyses
  - (R&D on exploiting methane hydrates in climate-friendly ways)
- Nuclear
  - International NERI
  - Expand/strengthen international studies of spent fuel/high level waste
  - Pursue new international agreements on fusion
  - (Improve safety and security of nuclear facilities worldwide)

Management

- Establish NSTC Working Group
  - Interagency secretariat, external Advisory Board
  - RD^3 Portfolio assessment; assist agencies; encourage RD^3 pipeline development
  - Work with agencies on internal/external monitoring/evaluation of programs
- Agency Program Management
  - With foreign counterparts, use competitive solicitations to build portfolio, with a well-developed business plan for moving technology through RD^3 pipeline
  - Identify clear, accountable management chains for international RD^3
  - Strengthen agencies through training, targeted hiring, rotating staff into agency
- Strategic Energy Cooperation Fund
  - Allocated to agencies according to portfolio assessment
  - Multiyear commitments to maintain continuity.

Development of a Strategic Framework and Action Agenda for International Cooperation on Energy RD^3



INITIATIVE BUDGETS
(above current spending)

		FY 2001	FY 2005
Foundations *($120 m - $240 m)*	Capacity building	$20 M	$40 M
	Sector reform	20	40
	Demo/buy-down	40	80
	Finance	40	80
End-use *($60 m- $120 m)*	Buildings	20	40
	Transportation	20	40
	Industry	10	20
	Cogeneration	10	20
Supply *($70 m - $140 m)*	Renewables	40	80
	Fossil	20	40
	Nuclear	10	20
Management	Working Group	--	--
	Program mgmt.	--	--
	Total (Strategic Energy Cooperation Fund)	**$ 250 M**	**$ 500 M**

The Window of Opportunity

- **Energy-sector restructuring and regulatory reform** will be largely completed over the next decade and will lock-in the mechanisms determining success or failure in the dual aims of attracting private capital and addressing public benefits;
- **Rapid Urbanization** will lock-in decisions about urban transportation networks, building design, and overall land-use--for a century or more
- **Time requirements for moving new technologies** through the innovation pipeline means that to affect deployments in the 2020s-2040s, the research has to be done in the next decade;
- **The technologies deployed in the 2020s-2040s** will strongly influence the trajectories of energy costs, GHG emissions, oil dependence, proliferation resistance, public-health impacts, and much else of the world energy system …. for most of the next century
- **Globalization of innovation capacity ….**

Fax

For ZP

Name:	Roger Ballentine
Fax:	456-1736
Phone:	456-1736
From:	Alan Bowser
Date:	March 28, 2000
Subject:	Clean Energy Trade Briefing

Per our request.

International Clean Energy Initiative
Industry Briefing
White House Conference Center
Truman Room
March 28, 2000; 2-5pm

AGENDA

I. *Introduction to the President's International Clean Energy Initiative* (10 minutes)
Roger Ballentine, Deputy Assistant to the President on Environmental Issues

II. *Perspectives from the Departments of Commerce, Energy, and the Export Import Bank* (15 minutes)
David Goldwyn, Assistant Secretary for International Affairs, Department of Energy
Jan Kalicki, Counselor to the Department of Commerce
Craig O'Connor - Export-Import Bank of the United States

III. *The Clean Energy Trade Promotion Initiative* (15 minutes)
Alan Bowser, Deputy Assistant Secretary for Basic Industries, Department of Commerce

IV. Questions from Industry

Clean Energy Trade Initiative Briefing
Talking Points
Jan Kalicki
Counselor to the Department
March 28, 2000

- I am pleased to be here with my colleagues from the Department of Commerce, Energy, and the Export Import Bank for the launch of this exciting Clean Energy Trade Initiative.
- Our Commerce Department colleagues are enthused by the broad range of support for this activity demonstrated by the presence of so many dynamic American companies, many of whom are long-time friends of the Department of Commerce
- From my experience in Russia, China, and the Caspian Region, I have seen an enormous interest for "clean energy technology," and believe that there are tremendous market opportunities for U.S. companies.
- We believe that there is a large market for clean energy products and services today and this market is expected to grow even faster than traditional fossil energy markets worldwide because:
- Rising incomes abroad have created a more affluent public which demands a cleaner environment. (Some of the most polluted cities in the world are in the five target countries.)
- The large fluctuations in the price of imported oil is an increased incentive for non-fossil energy sources.
- As evidence of global warming mounts, so will the international pressure to reduce fossil fuel emissions, particularly in these five large and growing markets. These countries too, are increasingly aware of the threat from global warming and are undertaking measures to decrease their emissions.
- Renewable energy and energy efficiency technologies have been improving steadily and are cost effective in many markets. Indeed, it is much (up to 3 times) cheaper to save energy through increased efficiency that to construct new power plants.
- We look forward to working with you on this very exciting project, and I greatly appreciate the initiative and hard work of the Office of Basic Industries in this effort.

EXECUTIVE SUMMARY

A significant market for climate change mitigation technologies and services has been created in developing countries, driven by power sector reforms, cost effectiveness, and environmental concerns. This report estimates the size of this market in developing countries, and discusses two scenarios for growth over the next ten years. The developing regions analyzed include Asia, Africa/Middle East, Eastern Europe and Russia, and Latin America. The sectors analyzed include commercial, residential and industrial use, energy supply, and transportation.

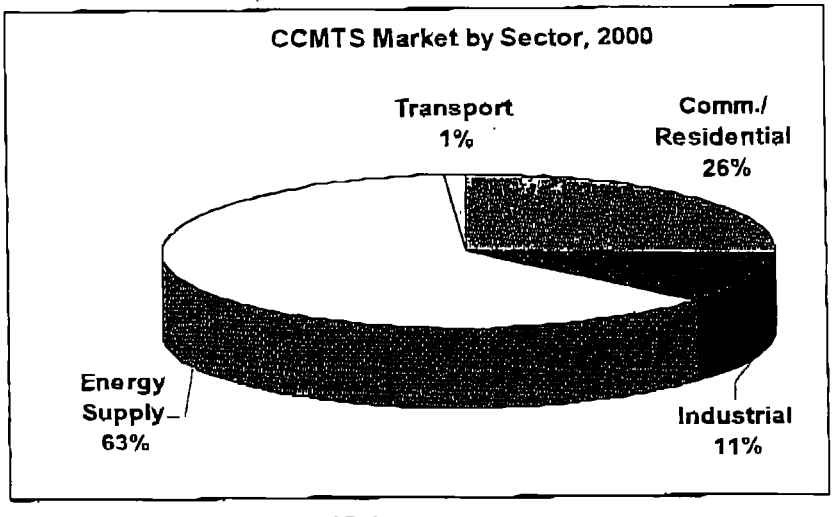
Combined, these four sectors make up a market for climate change mitigation technologies and services (CCMTS) that is estimated to be $29.9 billion in developing countries in 2000. The U.S. share of this developing country market is estimated to be $5.3 billion, or 18 percent, in 2000.

Market projections for growth to 2010 were developed under two scenarios, the "Business-As-Usual" scenario and the "Aggressive Growth" scenario. The Business-As-Usual scenario uses projected GDP growth rates to develop market estimates over the next ten years. Under the Business-As-Usual scenario, the CCMTS market is estimated to be $51.7 billion in 2010. The Aggressive Growth scenario takes into account the highest expected growth rates for technologies. Under the Aggressive Growth scenario, the CCMTS market is estimated at $64.9 billion.

Market Estimates for CCMTS ($ billion)

	2000	2010 (BAU)	2010 (Aggressive Growth)
Market Size	$29.9	$51.7	$64.9

As shown in the adjoining chart, technologies and services in the ***commercial and residential*** sector represent 26 percent of the overall market for climate change mitigation technologies and services including those for energy efficient lighting, building envelope, building process controls, household appliances, and heating, ventilation and air conditioning. In many regions this market is well developed due to promulgation of codes and standards, government and institutionally supported programs for demand-side-management and end-use efficiency.



Climate change mitigation technologies and services in the ***industrial*** sector include process design and controls, motors, boilers, co-generation, and adjustable speed drives. Although it is a growing market, the climate change mitigation technologies and services associated with the industrial sector make up only 11 percent of the market. The modernization and expansion of industrial sectors in developing countries will continue to create new opportunities in this sector.

The ***energy supply*** sector is typically the largest contributor to GHG emissions and is a growing sector in most developing countries. There are multiple technology options offering developing countries an opportunity to continue the expansion of energy supply with minimal additional emissions. The improved efficiency of new technologies and the desire to use cleaner fuels in new facilities have contributed to a sizeable market of 63 percent for clean energy technologies and services in developing countries. The ***transportation*** sector is usually the second largest contributor to greenhouse gas emissions, but makes up less than 1 percent of the current market for climate change mitigation technologies and services. Mass transit, technologies and services for alternative fuel vehicles, and intelligent transportation systems are gaining the attention of developing country governments as an alternative to the highly polluting vehicles and transportation systems currently in place.

As shown in the adjoining chart, ***Asia*** is by far the largest regional market, accounting for 55 percent of the total market. This is in part due to the sheer size and population of the region as well as the high rates of economic growth that have prevailed for most of the past 15 years. Although Asia dominates in terms of absolute size, ***Latin America*** represents a fast growing market accounting for 20 percent of the developing country market. The ***Middle East and Africa*** account for 15 percent, and ***Eastern Europe and Russia*** for the remaining 10 percent.

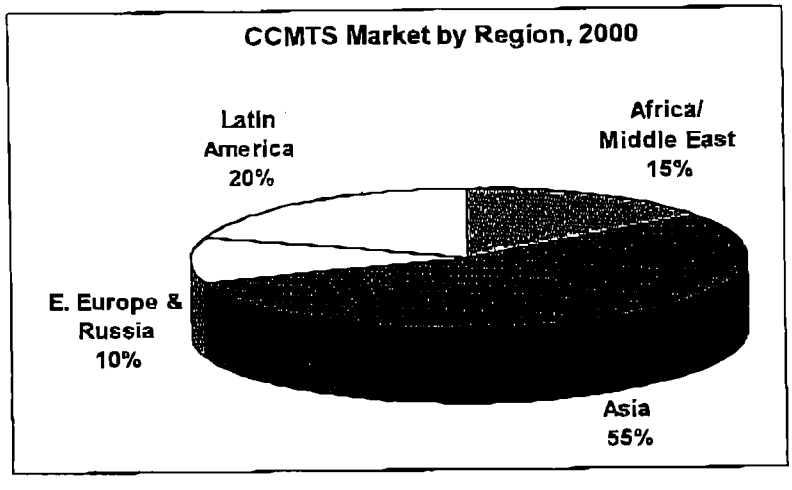
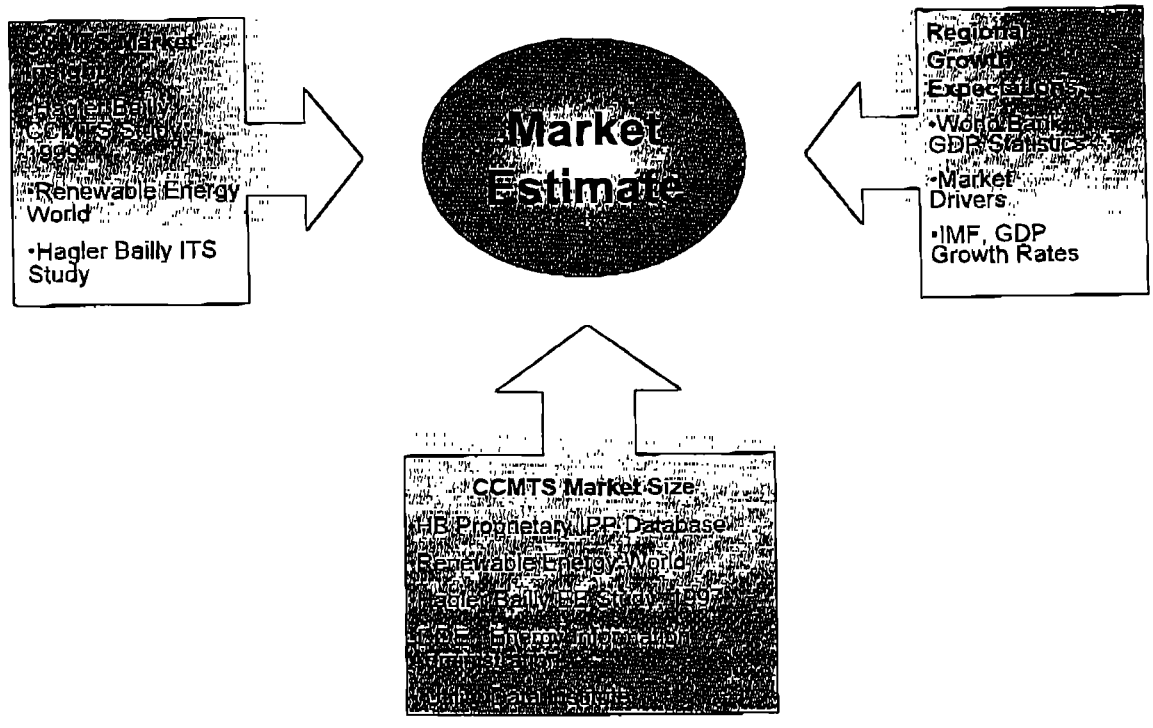


Exhibit 3: Framework for Market Development in Developing Countries



3.3 SIZE OF CURRENT MARKET FOR CCMTS

We estimate that the CCMTS market in developing countries is just under $30 billion in 2000 (Exhibit 4).

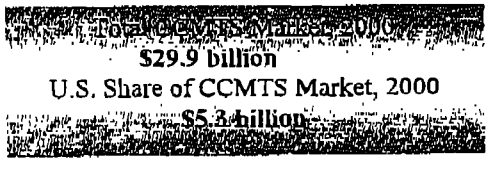


Exhibit 4: CCMTS Markets by Sector, 2000 ($ Million)

Region	Commercial and Residential Sectors	Industrial Sector	Energy Supply	Transportation
Africa/Middle East	$604	$210	$3,636	$19
Asia	$4,464	$1,959	$9,992	$41
East. Europe & Russia	$998	$509	$1,517	$83
Latin America	$1,658	$467	$3,691	$60
Total	$7,724	$3,145	$18,836	$203

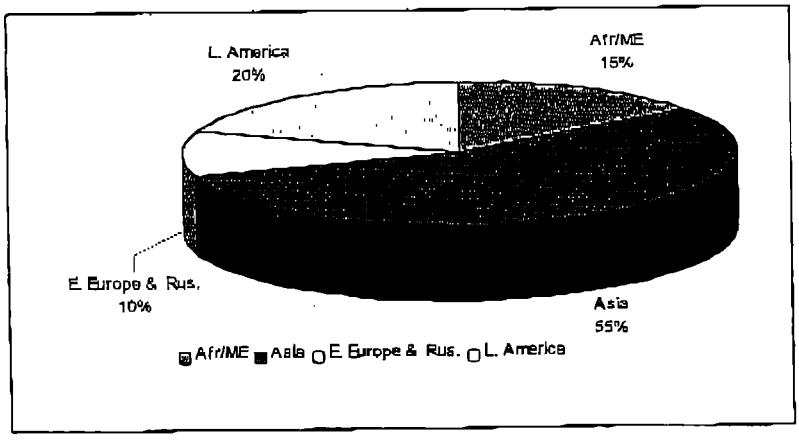
Hagler Bailly used 1998 U.S. export statistics as baseline data to derive the U.S. share of the total CCMTS market in the commercial, residential, industrial and power sectors. The 1998 estimates were adjusted to 2000 to reflect the underlying economic growth in developing regions. As shown in the adjoining table, the U.S. share of the CCMTS market is estimated to be $5.3 billion in 2000, or about 18 percent of the total market (remarkably similar to the U.S. share of worldwide exports for all goods and services in 1997).[7]

U.S. Share of CCMTS Market, 2000 ($ Million)

Sector	U.S. Market Share
Commercial and Residential	$1,692
Industrial	$883
Energy Supply	$2,650
Transportation	$81
Total	**$5,306**

Exhibit 5 portrays the CCMTS market by region. Asia is by far the largest regional market, accounting for 55 percent of the total market. This is in part due to the sheer size and population of the region as well as the high rates of economic growth that have prevailed for most of the past 15 years. Latin America makes up the next largest market with 20 percent of the developing country market. The Middle East and Africa account for 15 percent, and Eastern Europe and Russia account for the remaining 10 percent.

Exhibit 5: CCMTS Market in Developing Countries, 2000



COMMERCIAL AND RESIDENTIAL SECTORS

The commercial and residential sectors offer sizable opportunities to suppliers of CCMTS. Asia's construction boom of the 1980s and early 1990s helped propel this market overseas and it has continued to grow, expanding to Latin America, Eastern Europe and Russia and Africa and the Middle East. Exhibit 6 depicts the size of the market by technology and by region.

[7] Trade data from UNCTAD indicate that U.S. exports of goods and services in 1997 totaled $949 billion, or 19 percent of total exports from all OECD countries ($4,917 billion).

March 28 Briefing - Attendees to date (3/28 at 10 AM)

Company	# persons attending
ABB	3
ACEC	1
AED	1
Advanced Engineering Assoc. Intl.	2
Alpha-Gamma Technologies, Inc.	1
American Hydro Corporation	1
Applied Power Corp.	1
ARCO	1
Asian American Coal, Inc.	2
Babcock & Wilcox	1
Bob Lawrence & Associates	2
Black & Veatch	2
BP-Amoco	1
Burns & Roe Enterprises, Inc.	1
Caterpillar	1
Chemonics	1
Chevron	2
Chrysler	1
CMS Energy	1
Conoco	1
CSI	1
DB Riley, Inc.	1
Delphos International	1
Ecoenergy International Corp.	1
EIF Group	1
Energy Resources International	1
Enron	1
Enron Wind Corp.	1
Environmental Enterprises	1
Environmental Market Solutions	1
First Renaissance Ventures	1
Ford	1
Foster Wheeler Corp.	1
GE	2
Geologistics	1
Geothermal Heatpump Consortium	1
Global Energy	1
Greenstar	1
GVN	2
Hagler Bailly	1
Halliburton	0 - cancelled 3/22 PM.
HLK Controls	1
Honeywell	2

Johnson Controls	1
Johnson Development Company	1
K&M Engineering	2
Kay Winn	1
MagnaDrive	1
Morgan Meguire, LLC	1
NAHB	1
NAIMA	1
NRG Energy, Inc.	1
Phillips Petroleum Company	1
Portland Cement Trade Alliance	1
PVI Photovoltaics International	1
Rovanco Piping Systems, Inc.	1
Sempra Energy	1
Siemens	1
SENTECH, Inc.	1
Solar Electric Light Company	1
Southern Energy Inc.	1
Specialty Chemical Consultants	1
Stone & Webster Engineering	1
Texaco	1
Thermal Science Technologies	1
United Filter Systems	1
United Technologies	1
UNOCAL	1
VMA	1
Wayne Wright	1
Westinghouse	1
Whirlpool	2
Williams Companies	2
York International	1
Total	85

Associations	# persons attending
Alliance to Save Energy	1
America Wind Energy Association	2
American Consulting Engineers Council	1
Business Council for Sustainable Energy	1
Corporate Council of America	1
ECEE	1
IEA International Center for Gas Technology Information	1
NAESCO	1
National Electrical Manufacturers Association	5
National Mining Association	2

Solar Energy Industries Association	1
US-China Business Council	1
US Hydropower	1
Total	19

	# persons attending
USG	11
DOE/NREL	22 estimated
DOC	2
DOS	1
ITC	1
TDA	1
Total	37

GRAND TOTAL OF ATTENDEES 141

Clean Energy Trade Initiative

U.S. Department of Commerce
International Trade Administration
Deputy Assistant Secretary for
Basic Industries

Clean Energy Trade Initiative

- In support of the President's International Clean Energy Initiative to double U.S. clean energy exports by 2005
- A dynamic trade promotion program which emphasizes the positive contribution that American companies and U.S. exports can make to a cleaner environment and greater energy efficiency–worldwide

Clean Energy Trade Initiative

- Promotes the United States as the **premier** source of clean energy, clean energy technology, clean energy equipment, and clean energy services—in the world
- Identifies and publicizes U.S. company participants as world-class suppliers of clean energy technologies, equipment and/or services

Clean Energy Trade Initiative

- Identifies host government priorities and programs in the clean energy area
- Identifies private sector clean energy priorities and needs in each country
- Links U.S. companies with foreign buyers
- Generates exports

"Clean Energy" Sectors

- Energy Supply
- Manufacturing
- Commercial & Residential
- Transportation

Energy Supply

- Clean coal technologies
  - Fluidized Bed Combustion
  - Integrated Gas Combined Cycle
- Advanced natural gas technologies
  - Gas Combined Cycle
  - Fuel Cells
- Cogeneration

Energy Supply

- Renewable energy technologies
  - Solar, Wind, Biomass, Geothermal, Hydropower
- Nuclear power
- Electricity transmission & distribution improvements
- Consulting services

Manufacturing

- Industrial process controls
- Industrial motors
- Cogeneration
- Efficient boilers
- Consulting services

Commercial & Residential

- Energy-efficient lighting
- Building controls and HVAC
- Building envelope
- Household appliances
- Consulting services

Transportation

- Clean fuel vehicles
- Mass transit systems
- Intelligent transportation systems
- Energy efficient automotive parts
- Consulting services

Key Clean Energy Markets

- China
- India
- Indonesia
- Mexico
- Brazil

China

- Over the next 20 years, China will require US$1 trillion to meet its energy needs.
- In order for China to meet its long-term strategy to reduce its coal reliance (which makes up 75% of its energy mix), it will expand its natural gas infrastructure to triple gas usage from 2% to 6% by 2010.
- Liquefied petroleum gas (LPG) imports are projected to rise to 1.1 trillion cubic feet (tcf) by 2010 as the Chinese put LPG and compressed natural gas (CNG) buses and taxis into service.

10

India

- India's present power generating capacity is 20,000 MW short of current demand and will require an investment of $156 billion by 2010.
- Currently, 30,000 MW of existing capacity is in need of renovation and modernization.
- 7 percent of India's new generating capacity is projected to come from renewable sources.

Indonesia

- Indonesia has an installed electrical generating capacity of approximately 19.9 gigawatts (GW). 82% of this capacity is from thermal sources, 15% from hydro sources and 3% from geothermal sources.
- Indonesia relies on oil to supply about 50% of its energy needs even though it has significant gas (72.3 trillion cubic feet) and geothermal reserves.
- Indonesia's oil & gas sector attracted US$4 billion in foreign investment per year from 1995 to 1999. This level of investment is expected to continue.

Mexico

- According to its Energy Secretariat, Mexico must add 21,743 megawatts (MW) of installed power generation capacity by 2007 in order to keep pace with its projected 3.7% annual growth in electricity demand over the next two decades.
- 87% of new power generation plants planned by the Mexican Government will be fueled by natural gas.
- In rural areas, the Mexican Government is encouraging more investment in photovoltaic technologies to power schools and homes.

Brazil

- In order to meet growing electricity demand, Brazil's installed power generation capacity is anticipated to grow from 61,329 megawatts (MW) in 1998 to 104,665 megawatts by 2008.
- Approximately 92% of Brazil's electricity is generated by hydro power. The addition of new clean coal, natural gas, solar, wind and biomass power generation facilities is expected to lessen hydro's predominance.
- The Brazilian Association of Infrastructure has inventoried 626 electricity sector projects worth $95.1 billion which are planned through 2003.

Other Markets

- Russia
- Persian Gulf
- South Africa
- Egypt, Israel, Jordan
- Nigeria, Ghana
- Malaysia, Thailand, Philippines
- Hungary, Poland, Czech Republic
- Morocco, Tunisia, Algeria
- Korea

Clean Energy Trade Initiative

- A series of trade missions to key markets to emphasize
  - Trade Promotion
  - Market Development
  - Policy Dialogue

Trade Mission Activities

- Meeting with government policymakers
- Group meetings/structured discussions with leading local businesses
- Technical seminars

Trade Mission Activities

- Opportunities for informal exchanges with senior host government and local business executives
- Site visits

Mission Timetable

- Indonesia – August 2000
- Mexico – September 2000
- Russia – October 2000
- Persian Gulf – October 2000
- India – November 2000
- Brazil –November 2000
- China – November 2000
- South Africa – November 2000

Mission Partnerships

- U.S. Commercial Service
- U.S. Agency for International Development
- U.S. Department of Energy
- U.S. Department of Housing & Urban Development
- Export-Import Bank of United States
- Trade Development Agency
- Overseas Private Investment Corporation

For More Information

- Please contact the Office of the Deputy Assistant Secretary for Basic Industries, Energy Division, U.S. Department of Commerce, Washington, D.C
- Telephone 202-482-4931
- Fax 202-482-0170

Clean Energy Trade Initiative

U.S. Department of Commerce
International Trade Administration
Deputy Assistant Secretary for
Basic Industries

President Clinton and Vice President Gore: Expanding Trade and Ensuring a Healthy Environment

November 16, 1999

President Clinton and Vice President Gore today outlined a strategy to ensure that U.S. and international efforts to expand trade will help to strengthen, not weaken, environmental protections worldwide and serve the broader goal of sustainable development. In his State of the Union Address earlier this year, the President urged creation of a new American consensus on trade, built in part on an effort to "level up" environmental and other standards as international trade and investment rules are liberalized. The policy initiatives announced today will help further this goal by systematically integrating environmental considerations into the development of US trade policy, staking out US policy positions on key environmental issues before the World Trade Organization, and supporting complementary steps to improve international environmental practices and standards, including the provision of technical and financial assistance to help developing countries design and implement strong domestic environmental protections.

The U.S. and the WTO: Putting Human Face on the Global Economy. As part of his agenda for the new round of global trade negotiations set to be launched in Seattle, Washington later this month, the President has proposed broadening participation in the benefits of trade among and within nations in part by addressing key environmental and labor concerns. Today, the President elaborated on the environmental aspects of his appeal for a human face to be put on the global economy by:

1) **Signing an Executive Order to Require Environmental Reviews of Proposed Trade Agreements.** The President today signed an Executive Order requiring careful assessment and consideration of the environmental impacts of trade agreements, including through detailed written reviews of major trade agreements. The Executive Order for the first time formally institutionalizes procedures to ensure the timely consideration of environmental issues in the development of U.S. positions for trade negotiations. It represents a major development in the effort to integrate and balance the twin U.S. objectives of promoting economic growth through expanded trade and sustainable development through strong domestic environmental protections. Specifically, the Executive Order:

   - Requires written environmental reviews of comprehensive multilateral trade rounds, bilateral or plurilateral free trade agreements, major trade liberalization agreements in natural resource sectors, and other agreements that may have significant, reasonably forseeable environmental effects.
   - Requires that reviews be undertaken early enough in the process to help shape negotiating positions.
   - Requires public notice when a review begins; opportunity for input from outside experts and the public; and public release of the findings.
   - Requires that reviews focus primarily on environmental impacts in the United States and, as appropriate, also examine international and global impacts.
   - Directs the United States Trade Representative and Chair of the White House Council on Environmental Quality to oversee implementation of the Order in consultation with economic, environmental and foreign policy agencies.

2) **Issuing a White House Declaration of Environmental Trade Policy Principles to Guide US Negotiators and Ensure That the Work of the WTO Is Supportive of Sustainable Development.** The WTO Charter explicitly recognizes sustainable development as a fundamental goal. The President today issued a White House Policy Declaration on Environment and Trade outlining a set of principles to guide U.S. negotiators' efforts to ensure that the WTO fulfills this part of its mission. In particular, the Policy Declaration pledges the United States to pursue trade liberalization in the new round of trade negotiations in a manner that is supportive of our commitment to high levels of protection for the environment by:

   - Promoting reform of the WTO, notably its dispute settlement procedures, to improve their transparency and openness to public participation.
   - Strengthening cooperation between the WTO and other international organizations, particularly the United Nations Environment Program, with respect to environmental matters.
   - Identifying and pursuing "win-win" opportunities where opening markets and reducing or eliminating

subsidies can yield direct environmental benefits, such as by reducing fish and agricultural subsidies.

- Stating the US view that the WTO broadly accommodates trade measures in the context of multilateral environmental agreements when they carefully tailored and appropriately applied, such as in the Convention on International Trade in Endangered Species and the Montreal Protocol with respect to ozone depleting chemicals.
- Ensuring that trade rules are supportive of and do not undermine our ability to maintain and enforce fully our environmental laws by staking out US positions on issues such as the WTO's deference to national regulatory authorities, WTO members' rights to determine whether to accept another member's regulations as equivalent to its own, trade measures based on processes and production methods (PPMs), Ecolabeling, and Precaution.
- Ensuring the appropriate inclusion on U.S. trade negotiation teams of environmental, health and safety officials, and encouraging our trading partners to do likewise.
- Taking fully into account into account environmental implications throughout the course of the negotiations, including by performing a written environmental review of the new WTO round.

3) **Promoting Improved Environmental Practices in Developing Countries Through Technical Assistance to Strengthen Their Environmental Institutions.** The Administration today released a summary of U.S. Government environmental capacity-building efforts in developing countries, underscoring its commitment to the pursuit of sustainable development and high levels of global environmental protection, including through means extending beyond trade policy. The United States is working actively to ensure that developing countries have the capacity to address environmental management issues as they integrate into the world economy. We believe the absence of environmental regulatory and management capacity can undermine long-term economic development and threaten ecological systems essential to sustainable development, thereby limiting the contribution to broad living standards from expanded trade and economic growth. U.S. capacity building activities involve several agencies, including the U.S. Agency for International Development, Agriculture Department, Environmental Protection Agency, State Department, Justice Department, Department of the Interior, National Oceanic and Atmospheric Administration, and the Department of Energy. They fall into three broad categories:

a) Promoting integrated policies in developing countries to protect the environment while raising social and economic standards:

- Integrating economic, social, and environmental objectives into a mutually supportive policy framework.
- Strengthening legal, regulatory, and judicial policies and procedures as they relate to environmental management.

b) Promoting environmentally sustainable international trade and investment liberalization;

- Building institutional capacity in natural resources management and conservation.
- Enhancing the ability of countries to understand, participate in, and implement the provisions of international institutional frameworks, such as multilateral environmental arrangements and international trade agreements.
- Improving the environmental performance of international financial institutions and export credit agencies.

c) Assessing and mitigating environmental impacts of trade and investment liberalization:

- Enhancing stakeholder understanding of and participation in the identification and resolution of trade, investment, and environmental conflicts.
- Promoting transparent and open decision-making processes and strengthening of the capacity of all segments of civil society to participate in a meaningful way in decisions that affect their lives.

4) **Providing International Leadership on the Environment.** Americans today enjoy the strongest economy and cleanest environment in a generation, and the Clinton Administration is working with the international community to promote the same objectives around the globe. The United States has played a critical role in international efforts – through multilateral environmental treaties and other means -- to protect endangered species, phase out

highly toxic chemicals, restore fisheries, and address global warming. In addition, the United States has applied the highest environmental standards to its overseas lending and development assistance; promoted similar efforts at the World Bank and other multilateral institutions; and led efforts to build environmental safeguards into trade pacts like the North America Free Trade Agreement.

White House Policy Declaration on Environment and Trade

November 16, 1999

We must do more to ensure that spirited economic competition among nations never becomes a race to the bottom. We should be leveling environmental protections up, not down. International trade rules have increasingly important implications for the environment. They must be supportive of national policies that provide for high levels of environmental protection and effective enforcement.

--William Jefferson Clinton
March 15, 1999

General Points

Economic growth must be pursued in the broader context of sustainable development, which integrates economic, social, and environmental policies. Thus, trade policies must be complemented by policies that provide for high levels of environmental protection and effective enforcement of environmental laws at the national level.

The long-term maintenance of a prosperous economy requires a healthy environment, and vice versa. Trade liberalization and environmental protection are therefore both vitally important objectives. We are committed to pursuing both objectives and ensuring that they are mutually supportive. We will do this through a variety of different means, including but not limited to the upcoming WTO round.

Our broader efforts on the environmental front are reflected in our robust domestic regulatory framework, our support for strengthening international environmental institutions, our commitment to effective multilateral environment agreements, and our unwavering advocacy of transparent and accountable decision making by both national governments and international institutions.

For example, at the international level we are seeking to:

- strengthen UNEP's ability to help developing countries improve their capacity to protect their environment;
- preserve fragile ocean habitats through the International Coral Reef Initiative;
- protect the ozone layer through the Montreal Protocol;
- conserve the world's threatened biological diversity through the Global Environment Facility and our own bilateral assistance programs;
- strengthen the protection of threatened and endangered species through the implementation of the Convention for International Trade in Endangered Species (CITES);
- reduce or eliminate the dangers posed by hazardous chemicals in the U.N. initiatives on Prior Informed Consent and Persistent Organic Pollutants;
- increase conservation and sustainable management of shared fisheries;

The term environment is used in this statement broadly to also include health, safety, and the conservation of natural resources.

- promote higher environmental standards for the activities supported by international financial institutions and common environmental guidelines for national export credit agencies of all OECD countries; and,
- address the challenge of climate change and pursue clean energy development strategies.

Moreover, we are assisting other countries in developing national laws, enforcement mechanisms, and compliance monitoring systems, as well as providing scientific and technical assistance, to address environmental challenges, and will continue to do so. We are also supporting similar efforts led by international environmental organizations.

In the context of preparations for the Seattle Ministerial Conference, our proposals for the elimination or reduction of environmentally-harmful subsidies, tariffs and other barriers to trade are examples of our efforts to advance sustainable development through trade liberalization. By reducing trade barriers such as these, trade liberalization can promote competition and more efficient resource use, as well as contribute to higher standards of living and a cleaner environment.

Proceeding from our belief that trade liberalization must contribute to sustainable development, we will pursue trade liberalization in the new round of trade negotiations in a manner that is supportive of our commitment to high levels of protection for the environment. In particular, we will do so by:

- Taking fully into account environmental implications throughout the course of the negotiations, including by performing a written environmental review.

- Promoting institutional reforms to ensure that the WTO and its processes, notably dispute settlement, are transparent and that the public may contribute to its work.

- Strengthening cooperation between the WTO and international organizations with respect to environmental matters.

- Identifying and pursuing "win-win" opportunities where opening markets and reducing or eliminating subsidies hold promise for yielding direct environmental benefits.

- Complementing our trade policies with policies that provide for high levels of environmental protection and effective enforcement of our laws.

- Ensuring that trade rules are supportive of and do not undermine our ability to maintain and enforce fully our environmental laws.

- Ensuring the appropriate inclusion on U.S. trade negotiation teams of environmental, health and safety officials, and encouraging our trading partners to do likewise.

Taking Environment Into Account in Trade Negotiations

In order to ensure that the new round contributes to sustainable development, we are committed to identifying and taking into account environmental implications of the negotiations throughout the

course of the negotiations. This will be done through a variety of means.

Environmental reviews are an important tool for identifying a negotiation's potential environmental effects, both positive and negative, and facilitating consideration of appropriate responses to those effects either in the negotiations, through other means, or both.

For the new round, we will perform a written environmental review of its likely environmental consequences, with public input and sufficiently early in the process to be taken into account in formulating our positions in the negotiations. We have encouraged all WTO members to perform such reviews and are pleased that several have indicated their intentions to do so.

We have also proposed that the WTO's Committee on Trade and Environment be given the role of helping throughout the round to identify, discuss, and inform national deliberations and the negotiating groups on the environmental implications of the negotiations. At the same time, each negotiating group must address the environmental issues relevant to its work.

It is also essential that environmental agencies continue to participate actively with other agencies in the trade policy-making process.

Transparency and Openness

Transparency and openness are vital to ensuring public understanding of and support for the WTO and all international institutions. The United States has been a staunch advocate for WTO reforms, including greater interaction and exchange of information with the public though the creation of consultative mechanisms; provision of timely access to a wider range of documents such as submissions to dispute settlement panels, the findings and conclusions of dispute settlement panels, and WTO meeting minutes; provision of avenues for the filing of amicus briefs; opening dispute settlement meetings in WTO disputes; and improvement of compliance with established notification requirements that provide access to information on national laws and practices. The United States will continue to pursue a strengthening of the WTO's consultative mechanisms with stakeholders, particularly during the course of the new round.

While these reforms are critical to ensure the public a role in the multilateral trading system, transparency and openness are no less important at home. To this end, it is essential to keep the public informed about the negotiations and engage in regular dialogue between governments and stakeholders. We are committed to maintaining such informed dialogue as an important part of the policy-making process, in particular for the new round of trade negotiations, and we encourage other countries to do so as well.

Relations with International Environment Organizations

We support strong and effective cooperation between the WTO and international environmental organizations, including UNEP and the FAO, to contribute to coherence between trade and environment policies. We welcome the experience and expertise that such organizations have contributed to trade and environment discussions in the WTO and believe that such collaboration should be deepened.

This cooperation will be particularly valuable in the new round, and we will continue to look for and build on opportunities to capitalize on the expertise within the individual organizations and to ensure an integrated policy approach. In this connection, we welcome UNEP's proposal for a cooperation agreement with the WTO and will work with other WTO members to bring such an agreement to fruition.

Capacity-Building

The U.S. supports and will continue to promote capacity-building initiatives with other countries to help achieve high levels of environmental protection and effective enforcement. It is important that such continued work is undertaken to support the efforts of our trading partners to pursue environmental protection in tandem with trade liberalization. Closer cooperation with existing international organization, such as UNEP, should facilitate these efforts.

Win-Win Opportunities

We believe that WTO members must continue to work together to identify and take advantage of opportunities where its work on trade liberalization can also contribute to environmental protection through the elimination of subsidies and market access barriers that have harmful environmental effects.

We are actively pursuing such win-win opportunities in our call for:

- the elimination of tariffs on environmental goods and the liberalization of trade in environmental services to expand and accelerate diffusion of environmental technology, provide access to the latest methods of pollution prevention, and lower the cost of achieving environmental objectives;

- the elimination of harmful fishery subsidies that are contributing to overcapacity which in turn has lead to unsustainable patterns of fishing, as evidenced by serious depletion of global marine resources;

- the elimination of agricultural export subsidies and the continued transition away from those domestic subsidy programs that encourage degradation of natural resources and distort trade. The extensive use of these trade distorting subsidies and other practices have contributed to the overuse of crop production inputs, soil degradation, overgrazing, and other unsustainable practices.

We will continue to work with other countries and stakeholders to identify other possible areas where trade liberalization, including the elimination of environmentally harmful subsidies, can directly contribute to both economic growth and environmental protection.

WTO Rules

This Administration's commitment to strong and effective protection of the environment is fully

consistent with the international trading system, which permits Members to establish and pursue environmental protection while ensuring against trade protectionist abuse.

The WTO rules affirm that countries have the right to establish the levels of environmental protection that they deem appropriate. We will ensure that trade rules continue to be supportive of and do not undermine the ability of governments, including at the state and local levels, to establish and achieve their chosen levels of environmental protection -- even when such levels of protection are higher than those provided by international standards -- in a manner consistent with our commitment to science-based regulation.

Precaution

Precaution is an essential element of the US regulatory system given that regulators often have to act on the frontiers of knowledge and in the absence of full scientific certainty. We believe that this precautionary element is fully consistent with WTO rules, which make clear that a regulatory agency may take precautionary action where there is a rational basis for concern based upon available pertinent information. We will insist that this ability to take precautionary action be maintained in order to achieve our environmental objectives.

At the same time, precaution must be exercised as part of a science-based approach to regulation, not a substitute for such an approach. In this connection, the term precaution must not be used as a guise for trade protectionist measures as this would have the effect of casting doubt upon, and even undermining, environmental as well as trade policy objectives.

Deference

We believe that WTO rules recognize that there can be legitimate differences of view on scientific and technical issues in the development of health, safety, and environmental measures. WTO dispute settlement decisions in this area already reflect a considerable degree of deference to domestic regulatory authorities on scientific and technical matters. For example, in determining whether a measure is based on sufficient scientific evidence, as is required under the WTO Agreement on Sanitary and Phytosanitary Measures (SPS), dispute settlement panels have found that there need only be a demonstration of a rational or objective relationship between the measure and the scientific evidence to satisfy the requirement.

The United States will use appropriate opportunities to work to ensure that WTO jurisprudence continues to accord such deference. In this connection, we welcome the WTO Appellate Body's recognition that dispute settlement panels cannot engage in *de novo* review of scientific and technical judgments.

We are confident that WTO panels will show such deference to U.S. regulators given the integrity, rigor, and open and participatory nature of the U.S. regulatory system.

Equivalence

The SPS Agreement's provisions on equivalence (i.e., a WTO member's acceptance of another member's measure as equivalent to its own) reflect that importing parties, based on scientific or other objective information, may determine that an exporting party has not objectively demonstrated that its measures are equivalent to those of the importing party. Under these provisions, the United States is not required to accept an import that it believes, based on such information, does not achieve the level of protection sought by U.S. regulations.

PPMs

Measures based on processes and production methods (PPMs) have long been used in domestic environmental policy as an important and effective tool to protect the environment.

In the international context, however, the use of trade restrictions based on the way products are produced has engendered controversy. We would note that the Appellate Body report in the Shrimp/Turtle dispute concluded that such measures may be permissible when they are used to pursue legitimate environmental objectives. However, that report also makes clear that such measures must meet the rules of the trading system which guard against abuse. For example, trade measures based on a PPM must not be unjustifiably discriminatory or a disguised restriction on trade.

We will enforce those measures that are in place or are adopted in the future, and we will continue our existing policy to evaluate, on a case-by-case basis, when trade measures, including those based on PPMs, should be adopted to protect the environment.

Ecolabeling

Market-based approaches to environmental challenges, such as environmental labeling programs (ecolabels), are important and effective policy tools but should not be misused as hidden forms of trade protectionism.

Consumers have a legitimate interest in the environmental impacts of the products that they buy. Providing accurate information to consumers is an important market-based means of engaging consumers in and achieving health and environmental objectives. We will promote a domestic and international environment that is supportive of such approaches.

We believe and will defend our position that WTO rules provide sufficient flexibility to permit all forms of ecolabeling, including those involving criteria based on processes and production methods and those developed and maintained by private bodies, subject to the relevant disciplines of the multilateral trading system, including transparency and non-discrimination.

MEAs

The international community has developed a wide range of treaties and agreements to protect the environment. Multilateral environmental agreements are important for addressing environmental challenges of concern to all humankind. In this connection, trade measures can be a critical means of achieving internationally-agreed environmental goals and objectives when carefully tailored and

appropriately applied, as exemplified, inter alia, in the Convention on International Trade in Endangered Species and the Montreal Protocol. Trade measures in MEAs are broadly accommodated by the WTO.

We also believe that it is important that environment and trade officials work closely together and respect each others expertise in the context of negotiating and implementing both MEAs and trade agreements.

Investment

The United States believes that, like trade and the environment, investment and environment can also be mutually supportive and we are committed to ensuring that they are. We are actively engaged in analytic work in the OECD to address concerns raised in that forum regarding the relationship between international investment rules and the environment.

With respect to the possibility of supporting the development of investment rules in the WTO, the United States is opposed to any effort to launch a comprehensive investment negotiation in the new round. Nevertheless, we are reviewing the proposals which other countries have tabled to determine whether there are any elements that would be of interest to us in the WTO and that would be consistent with our commitment to maintain and defend high levels of environmental protection.

International Clean Energy Initiative
FY2001

Developing Technologies
Opening Markets
Closing Deals

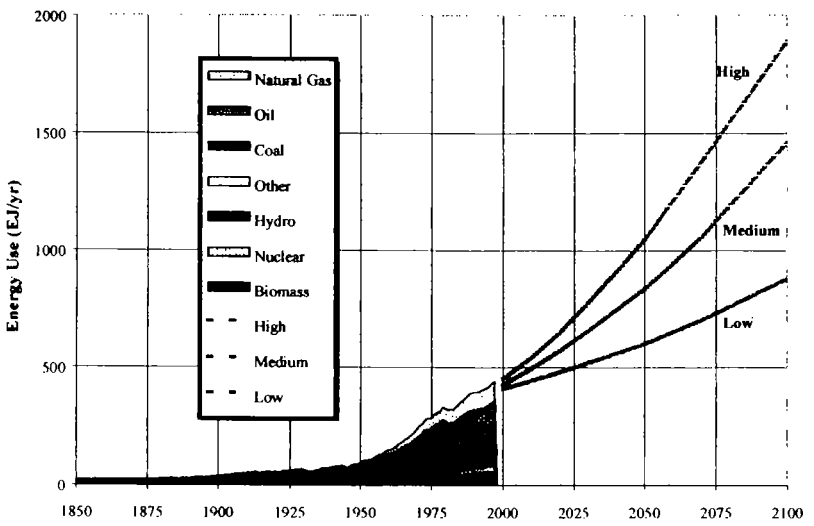
PCAST: International Energy-Linked Challenges

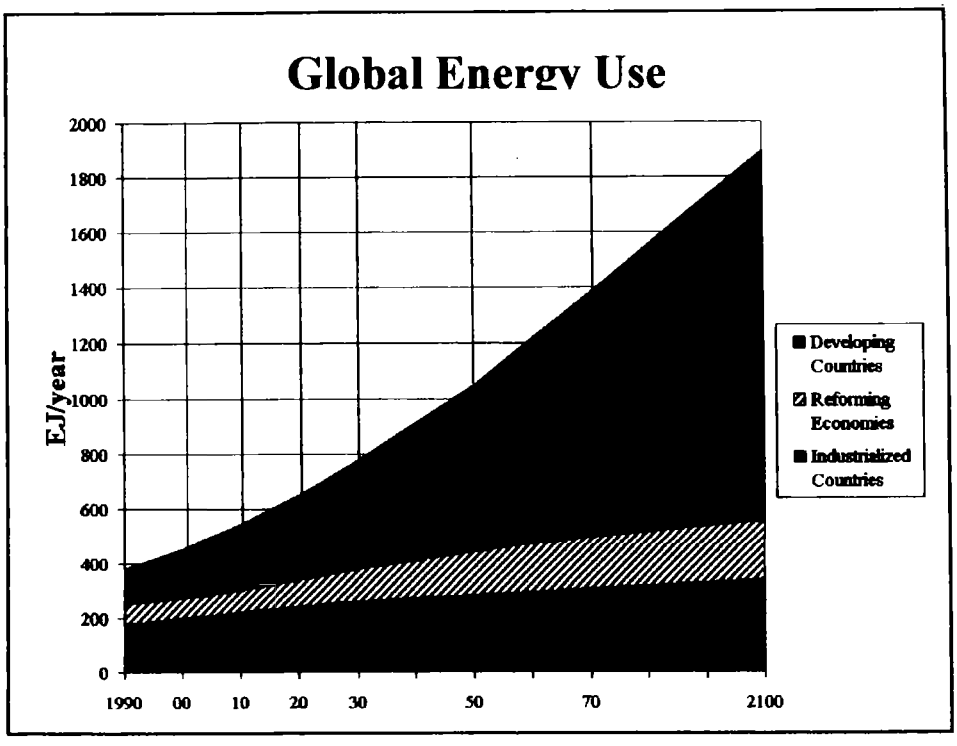
- Economy
  - Economic growth; economic development
  - Energy technology exports/Oil Imports
- Environment:
  - Local urban air quality, regional acid rain, global warming
- National Security
  - Dependence on insecure supplies of foreign oil
  - Links to nuclear proliferation
  - Economic development/political stability in developing countries
- U.S. Leadership in Energy Science and Technology
- U.S. Values
  - Human dignity/human rights, building civil society, equity, opportunity and self-determination, assistance for the least fortunate, stewardship for future generations and for the environment, security.

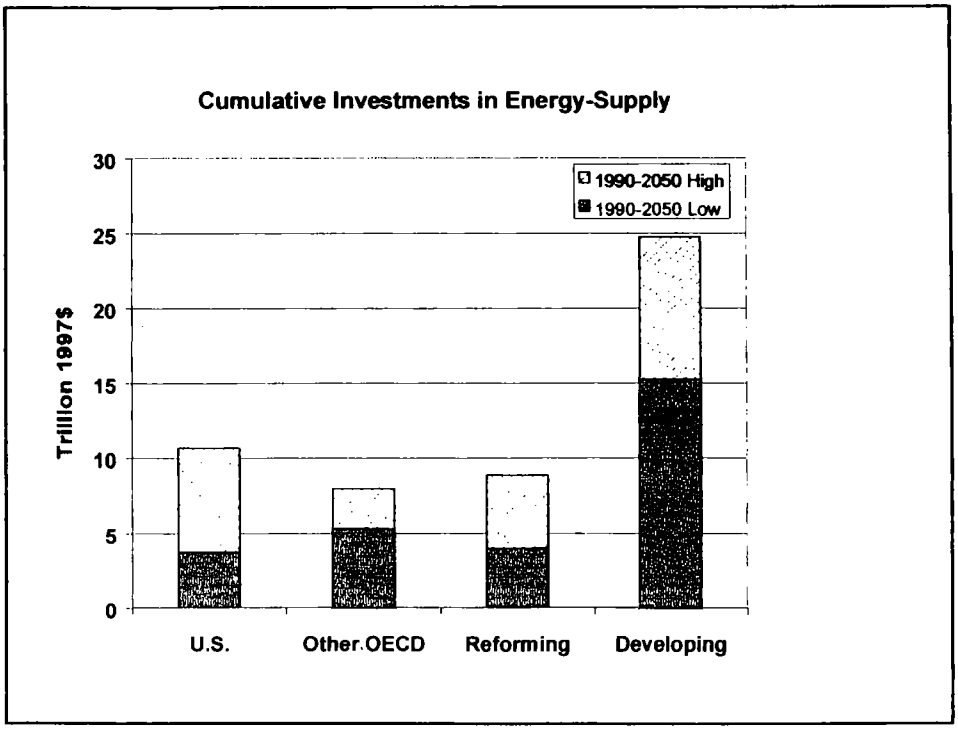
PCAST: Accelerating Energy Innovation Everywhere Benefits the United States by:

- reducing pressure on world oil supplies and the associated economic and political risks;
- improving nuclear energy systems on whose safety and proliferation resistance the whole world depends;
- reducing other countries' contributions to global air pollution and greenhouse gases;
- providing the energy basis for politically stabilizing and trade-enhancing sustainable economic development.
- enhancing U.S. access to increasingly global sources of innovation, increasing pace/lowering cost of innovation for U.S. applications;
- bringing U.S. firms access to and understanding of the large foreign markets for energy technologies.

Projections of Energy Use




Global Energy Use
EJ/year
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1990
00
10
20
30
50
70
2100
Developing Countries
Reforming Economies
Industrialized Countries


Cumulative Investments in Energy-Supply
Trillion 1997$
30
25
20
15
10
5
0
1990-2050 High
1990-2050 Low
U.S.
Other OECD
Reforming
Developing

PCAST: The Window of Opportunity

- **Energy-sector restructuring and regulatory reform** will be largely completed over the next decade and will lock-in the mechanisms determining success or failure in the dual aims of attracting private capital and addressing public benefits;
- **Rapid Urbanization** will lock-in decisions about urban transportation networks, building design, and overall land-use--for a century or more
- **Time requirements for moving new technologies** through the innovation pipeline means that to affect deployments in the 2020s-2040s, the research has to be done in the next decade;
- **The technologies deployed in the 2020s-2040s** will strongly influence the trajectories of energy costs, GHG emissions, oil dependence, proliferation resistance, public-health impacts, and much else of the world energy system .... for most of the next century.

Strategic Approach: Focus and Leverage

- **What?**
  - Develop/adapt Technologies
  - Open Markets
  - Close Deals
- **Where?**
  - Key emerging markets
- **How?**
  - Better manage/target existing federal programs
  - Seek additional resources to meet global opportunities
  - Use multilateral institutions and dialogue to support goals
  - Launch a 5-year program to meet ambitious goals.

Develop Tech	Open Markets	Close Deals
Building design, equipment,and appliances Industry best practices: motors, controls, ... Combined Heat/Power Advanced Coal/hydrogn, methane leak reduction Nuclear research, INERI Renewable Energy: PV, wind, biomass, ...	Technical/policy support for sector reform that creates open competitive markets, and protects public interest. Training and capacity building Codes/standards for open internatnl markets R&D Institution exchngs	Prefeasibility analyses Feasibility analyses Financial assistance, possibly including local exchange financing Trade support--trade missions,conferences, seminars, shows, other information exchange Work with MDBs/GEF
Build on domestic R&D; target key countries.	Leverage U.S. and foreign experience.	Link technology, markets, and deals
DOE: $40M USAID: $ 8M	USAID: $32M DOE: $ 3.5M	ExIM: $15M TDA: $ 5M DOC: $ 4M DOE: $ 2.5M

Energy Efficient Buildings

- **Goal:** Cut energy use in new buildings by 50% over the next 20 years (PCAST).
- **Develop/Adapt Technology.** Develop/adapt whole building energy design tools to country conditions; develop/demonstrate building energy codes/standards. Provide technical support to develop/adapt/demonstrate building equipment/ appliance energy efficiency codes/standards/labels; assist development of national test facilities and test programs. Provide technical assistance to develop cost-effective biomass-fueled stove with 2x higher efficiency and 10x lower emissions.
- **Open Markets:** Harmonize energy efficiency standards, test methods, and rating procedures to facilitate international trade and minimize burdens on U.S. manufacturers.
- **Close Deals.** Provide technical assistance and training in Energy Star labeling and Energy Savings Performance Contracting. Provide in-country policy/program assistance for implementation. Support trade missions, feasibility studies, finance,...
- **Budget Request.** DOE-$4.5M for technology development/technical assistance; USAID~$2M for in-country policy and program assistance; DOC/TDA/ExIm for feasibility studies, trade, and export support.

Energy Efficient Industry

- **Goal.** Reduce energy intensity of major energy using industrial processes over next two decades by 40% compared to current performance (PCAST).
- **Develop/Adapt Technology.** Establish an industrial best practices program for targeted developing countries to extend /adapt the information/tools from U.S.experience on motors, controls, compressed air, steam, etc. Engage U.S. industry in partnerships through the development of technology roadmaps to reduce energy intensity of major energy-using industrial processes in key developing countries.
- **Open Markets.** Provide training, technical/policy/program assistance to address legal, regulatory, permitting, and market barriers to efficiency.
- **Close Deals.** Support trade missions, feasibility studies, other export supports.
- **Budget Request.** DOE-$2.5M for technology development/technical assistance; USAID~$1M for in-country policy and program assistance; DOC/TDA/Exlm for feasibility studies, trade and financing support.

Energy Supply: Fossil

- **Goal.** Develop decarbonization/sequestration techs to make possible economic use of fossil fuels with near-zero lifecycle CO_2 and pollutant emissions (PCAST).
- **Develop/Adapt Technology:**
  - **Combined Heat and Power (CHP):** Transfer best practices for optimizing coal-fired power plants; where opportunities exist configure systems for CHP and encourage maximum use of CHP.
  - **Advanced Coal:** Accelerate Vision 21 development options, including hydrogen and oxygen separation, reformer, and catalytic technologies.
  - **Methane Leak Reduction:** Methane leaks in Russian oil and gas operations are estimated at 1 TCF/year. Develop and transfer advanced technology for pipeline leak and intrusion detection systems with internal leak sealing and coating materials, and improved corrosion-inhibition treatments for gas gathering lines.
- **Open Markets:** Asian-Pacific Economic Council Natural Gas Initiative--Identify/develop policies and regulatory practices to increase private capital formation for natural gas infrastructure development in the APEC region.
- **Close Deals:** Support trade missions, feasibility studies, other export supports.
- **Budget Request:** DOE-$12.78M for technology development/technical assistance; DOC/TDA/Exlm for feasibility studies, trade and financing support.

Energy Supply: Nuclear

- **Goal:** To preserve/enhance possibility that nuclear power could play expanding role addressing energy-linked challenges in 21st century (PCAST).
- **Develop Technology: International Nuclear Energy Research Initiative,** Promote collaborative research focused on advanced technologies for improving the cost, safety, waste management and proliferation resistance of advanced nuclear energy systems through specific cost shared arrangements with participating countries. Conduct long-term nuclear technology research in the areas of new and innovative reactor designs, proliferation-resistant fuel cycles, and nuclear science and engineering.
- **Open Markets:** Improve the safety and security of nuclear facilities worldwide; strengthen nuclear regulatory regimes and institutions to develop a safety culture.
- **Close Deals:** Support trade missions, other export supports for technologies providing strong proliferation resistance, high safety, and minimum waste.
- **Budget Request:** DOE-$6.814M for technology research; USAID-$0.5M for support of NRC work on nuclear facility safety and security.

Energy Supply: Renewables

- **Goal:** accelerate development/deployment of renewables to contribute to world energy supply by 2025-2050 at levels comparable to fossil fuels today (PCAST).
- **Develop/Adapt Technologies:**
  - **Resource Assessment.** Assess the renewable energy potential of selected countries and regions including their solar, wind, biomass geothermal and hydro resources.
  - **Photovoltaics**: Accelerate RD&D of PV technology for use in rural minigrid and offgrid applications in developing countries.
  - **Bioenergy:** Evaluate costs of distributed grid-connected biomass coproduct systems. Demonstrate small scale biomass systems in minigrid hybrid applications.
  - **Wind Energy:** Partner with industry in grid-connected wind power projects and wind-hybrid systems in mini-grid applications..
  - **Geothermal:** Assist US industry identify new markets in developing/transition countries, including prefeasbility studies, technical assistance, education.
- **Open Markets:** Provide information, training, technical/policy/program assistance to address legal/regulatory/permitting/other barriers to renewables.
- **Close Deals:** Support trade missions, feasibility studies, other export supports.
- **Budget Request:** DOE-$13M for technology development/technical assistance; USAID-$4M; DOC/TDA/ExIm for feasibility studies, trade and financing support.

Open Markets

- **Goal:** Build local capacity in energy technology/policy; support/shape energy-sector reform/restructuring to open, competitive markets w/ public goods (PCAST).
- **Capacity Building:**
  - **Training:** Expand existing and develop new training programs and partnerships focused principally on training energy sector policy makers, regulators, and utilities to further sector reform and improve sector operations towards open competitive markets.
  - **Energy Modeling:** Develop country specific macros energy models that integrate energy supply, demand, externalities, and other key factors.
  - **Laboratory Exchanges:** Build long term relations between US labs/other research institutions and foreign research centers through exchanges; project monitoring/evaluatn.
- **Energy Sector Reform:**
  - **Technical and Policy Assistance:** Provide technical/policy assistance for legal/ regulatory reform and establish policies to move towards open competitive markets that "get prices right" while advancing publicinterests.
  - **Data and Analysis.** Develop country-specific macro energy models and in-country capacity to conduct microeconomic analyses of technologies and policies.
  - **Gas Grids**: Assistance in establishing evolutionary regulatory frameworks for gas.
- **Budget Request:** USAID-$22M; DOE-$3.5M

Close Deals

- **Technical Assessments (prefeasibility).** DOE to identify specific projects using results of assessments and modeling analyses. Provide technical support to development of project proposals. Work with U.S. industry, potential partners in targeted countries, and public/private financing sources to facilitate preparation.
- **Feasibility Studies.** TDA to identify and inform U.S. firms of commercially viable project opportunities, support feasibility studies, and provide technical assistance, legal, and financial advice to enable project implementation.
- **Financing.** Exlm to provide financing for clean energy technology exports, possibly including local currency financing; increase marketing and outreach.
- **Market Development:** DOC to promote export of US clean energy supply and efficient end-use equipment through conferences, seminars, exhibitions, reverse trade missions, trade shows, technical/policy assistance, other.
- **Budget Request:** Exlm-$15M; TDA-$5M; DOC-$4M; DOE-$2.5M.

Goals

- **Doubling clean energy technology exports by 2005**, creating as much as $5 billion in new export revenues for U.S. companies and as many as 100,000 new U.S. jobs.
- **Cutting energy use in targeted country buildings and appliances in half** through advanced building design tools and building equipment codes and standards.
- **Developing integrated renewable energy technologies** that have the potential to power full range of energy services for 2 billion people in rural developing countries
- **Sharply reducing sulfur, particulate, and greenhouse gas emissions** by developing advanced coal-fired power plants and low-cost hydrogen fuels.
- **Maximizing use of combined heat & power systems.**
- **Reducing methane emissions from pipelines** and other fossil sources by an amount equal to as much as 100 million metric tons of carbon per year by 2005.
- **Providing technical/policy support for development of natural gas grids.**
- **Reducing energy use in the industrial sector** through introduction of best practice.
- **Conducting research in nuclear energy** to address cost, waste, safety, proliferation
- **Providing technical and policy assistance in support of energy sector reform** that creates open, competitive markets while protecting the public interest.

International Clean Energy Initiative Summary Budget Request

• DOE	$ 46M
• USAID	$ 30M
• DOC	$ 4M
• TDA	$ 5M
• ExIm	$ 15M
	$100M

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MEMORANDUM

DATE: December 3, 1999

TO: Roger Balentine
Deputy Assistant to the President for Environmental Initiatives

Jeff Seabright
Executive Director, White House Climate Change Task Force

FROM: Brad Johnson

SUBJECT: Clean Air Bond Initiatives

Attached herewith is a two-page Clean Air Bond proposal with a cost estimate. Also attached are questions and answers that embellish our thinking on this matter.

We are currently reaching out to private utilities to get a reading of their reactions to this proposal. We should have something to share with you by Wednesday or Thursday of next week.

Please call me with any questions.

CMA Speech

Clean Air Bond Initiative

Purpose:

To create economic incentives, through the provision of low cost capital, for investor-owned utilities to accelerate investments in clean technologies.

Program Outline:

Through amendments to the Internal Revenue Code, create a special class of tax-exempt "private activity bonds" called "Clean Air Bonds" ('CABs') to finance "qualified clean technology investments."

"Qualified clean technology investments" ("QCTIs") are investments in technologies that reduce the emissions of SOX, NOX, SO_2 and CO_2 in existing power generating facilities and investments to facilitate conversion to new cleaner fuel sources at existing power generating facilities.

The Internal Revenue Code (the "Code") generally prohibits the use of tax-exempt bonds for the benefit of private parties. However, recognizing that certain capital investment by business should be encouraged and assisted, Congress has permitted tax-exempt "private-activity bonds" issued by state and local governments on behalf of private companies for certain purposes subject to a national volume cap. These include bonds issued for certain targeted housing and economic development purposes and a group of uses known as exempt facilities. These include facilities for the furnishing of water, sewage facilities, solid waste disposal facilities, and hazardous waste facilities. Air pollution control investments were qualified exempt facilities prior to the enactment of the 1986 Tax Reform Act. That Act also lowered the volume cap for "private activity bonds."

Under the exempt facility provisions, companies are able to borrow funds at below-market rates to finance investment in wastewater treatment, solid waste disposal and other qualified pollution-control-related facilities. The ability of companies to borrow at tax-exempt rates substantially reduces the cost of financing environmental facilities that, in the end, benefit all citizens, since companies' production processes are made more environmentally sound. Companies who wish to borrow in the tax-exempt bond market must first obtain a volume cap allocation from an appropriate state authority.

Rather than having CAB authority allocated to states by formula, as is the case with existing "private activity bonds" authority, CAB authority will be allocated to utilities pursuant to a national competitive/evaluation procedure. Under this procedure, once a year, a Clean Air Bonds Board would issue requests for proposals ("RFP") for the allocation of CAB authority. Prior to issuance of the RFP, the Board would establish criteria for competitive evaluation which would place a heavy emphasis on emission reductions produced by each respondent's proposal expressed in terms of annual tons of NOX, SOX, SO_2, and CO_2 emissions reduced per dollar of allocated tax-exempt CAB

authority. A present valuing of pollution reduction (i.e. a project commencing the reduction of one ton of pollution in 2001 would receive a higher score than one commencing reduction of one ton of pollution in 2002), a likelihood of completion factor, and the attainment classification of the air quality control region(s) affected by the plants' emissions would be included in the evaluation criteria.

Tonnage reductions would be calculated by taking the current level of permissible or actual emissions of the existing plant, whichever is lower, against the level of emissions projected after the QCTIs are in place, as certified by an independent engineering firm's plant analysis.

This system of competitive evaluation is designed to allow the private sector to price the value of emissions reductions and to produce the greatest amount of emissions reductions per dollar of tax-exempt financing. All applicants must be in compliance with applicable federal and state clean air requirements or have entered into a consent agreement with the Environmental Protection Agency ("EPA") to bring the applicable plant into compliance within a specific term certain.*

The total volume of CABs would be $3 billion annually over the years 2001-2006.

No company may receive more than 35% of the annual CAB allocation and no plant may receive more than 20% of the annual CAB allocation.

Program Costs:

The Joint Tax Committee has not produced estimates of the revenue effects of this proposal. However, in 1998, the Committee produced revenue estimates for S.2151 which called for an increase in the "private activity bonds" volume cap from $15.3 billion to $23.6 billion in 1998 and adjusted annually thereafter for inflation. This $8.2 billion dollar increase was projected to result in revenue losses of $5.3 billion over ten years. Using these estimates as a benchmark, a $3 billion annual CAB program would approximate the following revenue losses over five years:

(Millions in Dollars)

1st	2nd	3rd	4th	5th	Total
20.88	63.36	107.64	147.60	183.96	523.44

WSH32728.1

*It should be noted that under the vagaries of the Clean Air Act, different power generating plants may be subject to different emission levels.

QUESTIONS AND ANSWERS

Question 1. Will the issuance of $15 billion dollars in Clean Air Bonds over five years have any adverse impact on the tax-exempt financings of state and local governments?

Answer: Unlikely. Last year more than $320 billion dollars in tax-exempt bonds were issued by state and local governments. A $15 billion dollar increase over five years to this level of market activity will have an insignificant impact on the pricing of tax-exempt financing.

Question 2. Why provide a subsidy through "private activity bonds" which require state and local authorities to issue the bonds on behalf of private utilities? Why not directly subsidize the utilities' financing?

Answer: State and local government involvement is important for two reasons. First, implementation and enforcement of the Clean Air Act involves a federal/state partnership that will be further enhanced by this financing mechanism. State agency review of private sector submissions to the Clean Air Bond Board will ensure that federal financing subsidies are consistent with state implementation policies. Second, because deregulation in the energy sector is taking place on a state-by-state basis, it is important that federal financing assistance is coordinated, consistent and in compliance with state deregulatory initiatives. This method of financing assures that will take place.

Question 3. Will this program provide federal tax subsidies for projects that would have been undertaken in any event and therefore involve a misuse or waste of federal resources?

Answer: The question of additionality is an important one. However, two aspects of the program protect against federal subsidies for projects that would have gone forward in any event. First, because the financing goes through state authorities that have an extensive knowledge of the compliance strategies of local utilities, states will provide a first threshold evaluation of whether projects provide additional environmental benefits. The U.S. Energy Information Administration, for example, projects that 1,240 MW of renewable capacity will be built in the United States between 2000-2005, mostly in the form of state-mandated projects. These projects would be ineligible for CABs.

Second, because the low-cost capital is provided on a competitive basis, only those projects that produce the greatest environmental benefits will be funded. To achieve the greatest reduction in emissions per dollar of subsidy, utilities generally will need to propose projects that go beyond mandated investment.

Question 4. Will public utilities strongly oppose this initiative?

Answer: Consultation with the public utilities will be necessary to facilitate board coalition support for this initiative. A degree of tension currently exists between public and investor owned utilities ("IOUs") over the advantages public utilities enjoy in an increasing competitive market. Edison Electric Institute ("EEI") is concerned that public utilities have access to lower-cost capital through tax-exempt financing. Although EEI would prefer to eliminate all tax-exempt financing of public utility investment, expansion of that benefit to IOUs may mitigate against those efforts. Moreover, there is a historical precedent of tax-exempt financing for private utilities and utilities currently have access to tax-exempt financing for certain non-clean air related projects, such as hazardous waste and wastewater treatment.

WSI\32798.1

Brad Johnson

John, Brad, Angela, Kate

- In '86 Congress limited state + local tax exempt pollution control bonds
  - limited these "private activity" bonds
  - no longer authority for clean air, clean water bonds.
  - also overall cap on tax exempt
- Would like to create new program outside of cap. budget certain $ and have people bid on that
- support for tax exempt bond/state authority
- New plant building/refinishing done through private financing
  - alternative to accelerated depreciation
- This is lower cost financing.
- On international side, currency risk can be hedged on short term basis, but long term harder. Could extend time period for clean energy.

CLEAN ENERGY FOR THE 21ST CENTURY INITIATIVE:

GROWING DEVELOPING ECONOMIES AND PROTECTING THE ENVIRONMENT

A Coordinated, Multi-Agency Initiative to Promote Exports, Boost America's Competitiveness, Create Jobs, Assist Developing Countries, Clean the Air, and Fight Climate Change

Vision Statement:

In the 21st Century, the world need not pay the price for economic development that we paid in the 20th Century. With the benefit of the technologies of today and tomorrow, the developing world can grow their economies and protect the environment at the same time. This initiative will accelerate the development and deployment of clean energy technologies for sustainable development and climate benefit by investing in these technologies, removing market barriers, and providing new incentives for innovation and exports of cleaner and more efficient energy technologies.

The Problem:

Developing countries will face many choices between less and more favorable environmental alternatives, whether in adding power generation, constructing residential or commercial buildings, or in energy-consuming products and processes. We assume that all things being equal, they would prefer the more environmentally favorable alternative. We also assume that environmentally superior options exist that are comparable in terms of performance and technical feasibility. But the market may not adequately reflect the environmental costs (externalities) of the choices, or it may be that the environmentally superior option simply is more costly to the decisionmaker, at least on an up-front basis. In addition, the less desirable alternatives may have advantages based on familiarity, pre-existing relationships, less perceived risk, or existing political/policy realities. Finally, lack of consumer awareness may deflate demand-side pressures for environmentally preferable options. *The goal of this initiative is to make "cleaner" more competitive.*

Objectives:

- Increase and "green" U.S. private capital flows and exports in energy and industrial infrastructure to the developing world by:
    - Developing markets through research, advocacy and capacity building;
    - Supporting the development of clean energy technologies;
    - Reducing trade and political barriers on both a bilateral and multilateral basis;

- Providing incentives for market-based clean technology transfers from the U.S.;
- Exploring options for financial support, such as cost buy-down, to achieve market penetration for clean-option U.S. products and services;
- "Greening" U.S. export agencies.

- Protect American competitiveness and maximize global environmental benefit by "Greening" multilateral institutions and increase multilateral cooperation.

Specific Targeted Sectors/Products:

- Buildings and appliances (including design services)
- Industrial equipment and processes (CHP, efficient motors, clean boilers, etc.)
- Transportation (hybrids, fuel cells, etc.)
- Fossil energy services/products (clean coal, gas)
- Renewable energy technology (wind, solar, biomass)

Existing Related Programs/Proposals

- PCAST (NSTC working group)
- ExIm Bank "Clean Energy Program"
- DOE Fossil Office/Clean Energy Program
- Office of Environmental Technologies Exports (ETE) at Dept. of Commerce/ETWG/ETTAC
- EPA International efforts
- ExIm/OPIC/TDA green exports initiative
- CEQ Interagency Environmental Technology Office (IETO)
- Others?

New Proposals

- Debt relief for clean energy?
- International "Energy Star"?
- "Clean Energy Export Fund"?
- Lane/Holdren proposed Executive actions
- Others?

DRAFT 12/08/99
INTERNATIONAL CLEAN ENERGY INITIATIVE
Budget Summary

	PRINCIPAL ACTIVITIES*	PCAST Recommen-dation	Over-target Request FY2001
Clean Power: Fossil	Powerplant improvements Combined Heat and Power Fuel Cells Advanced Coal/Hydrogen production and use Methane Leakage Reduction/Recovery Sequestration Policy support for gas grid development; data/analysis	35	32
: Nuclear	International NERI Reactor Safety	10	8
: Renewables	Resource Assessment Grid-Systems with biomass, PV, wind Off Grid/Mini-Grid systems with biomass, PV, wind	40	32
: Building Efficiency	Energy Efficient Buildings. Appliances, Stoves	20	19
: Industry Efficiency	Energy Efficient Industry Best Practices	10	6
Energy Sector Reform and Capacity Building	Power Sector Restructuring/Policy Reform: Regional Energy Innovation Networks: Institution Building	35	33
Finance	Technical Assessments: Feasibility Studies Partial Grant Loan Guarantee Mechanism MDB Technical/Financial Assistance International Market Development Exlm Exchange Risk Assistance Fund Revolving Fund: small business project development	80	53
TOTAL		250	$183

AGENCY	Domestic FY2000 Base	International FY2000 Base	International In-Guidance Request FY2001	International Over-Target Request FY2001
DOE	~800+	~25	~32	72
USAID	NA	~225	~225**	67.5
DOC+				8
Ex-Im	NA	NA	NA	15
OPIC	NA	NA	NA	3.5
TDA	NA	15.7***	19.25	17

*NA—Not Applicable
**FY2000
***FY1999
+includes some support for TDA.

Memorandum

To: Roger Ballentine
From: David Hales

Subject: Use of Defense Installations as demonstrations of US Energy Initiative Technology

One of the major obstacles to dissemination of US private sector technology is a lack of easily accessible examples that demonstrate to utility of the technologies under conditions that prevail in developing countries.

In many of these countries, the Department of Defense has installations that already, or could in the near future, utilize the best private sector technology breakthroughs. Many of these installations, in cooperation with suppliers, could serve as demonstration project to familiarize potential purchasers with the practicality and adaptability of US technology, and help create market demand.

Funding could come from existing facilities development and maintenance budgets, with technical guidance from the Department of Energy.

The USG, as summarized in the PCAST Report, believes that new energy technologies are both more reliable and less costly. US procurement and facility management policy should demonstrate that belief, and could be used to help drive dissemination of US technology.

Memorandum

To: Roger Ballentine
From: David Hales

Subject: DoD/ Export Sales Offsets

Export sales "offsets" have been widely used as to encourage purchase of US goods and services with limited foreign currency accounts, especially in countries with nonconvertible national currencies (precisely those we should target for the 21st century Energy Initiative). An offset is a contractual agreement by the seller to invest in purchasers' economies. Offset agreements can be made by governments or private sector entities.

Since 1975, at least $60 billion has been earmarked against foreign military sales alone. Reinvestment does not occur quickly. A conservative estimate is that at least $10 billion is CURRENTLY AVAILABLE from arms sale offsets. Available offsets from other categories of exports probably total at least this amount.

For very little extra budget, the USG (USAID, Commerce, Energy, OPIC, TDA, ExIm) could offer assistance in investing offset funds in mitigation and sequestration of greenhouse gases and energy efficiency. Several approaches come to mind:

- Leveraging offset accounts with public sector cost-sharing (risk reduction).
- USAID brokering of local joint ventures (CDM projects) that focus on energy efficiency and emission reductions.
- Creation of a "Clean Energy Fund", combining USG cost-sharing with private financing, returning interest to private investors at a market rate, while creating an efficiently run investment portfolio.
- USG facilitation of multicountry exchanges which promote clean energy and which could be used as incentive to "participate" in FCCC mechanisms.

This would obviously take some work, but could be a strong tool for climate diplomacy, promote the PCAST recommendations, and provide some juice for the Clean Energy initiative. Just raising the possibility would score points with US industry. NOTE: it would also raise hackles with labor over potential jobs loss, and would need to be handled carefully.