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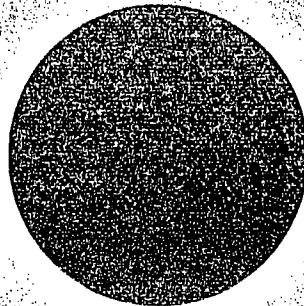
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Climate Change: The US Position

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**CLIMATE
CHANGE
THE
U.S.
POSITION**



COP-4, BUENOS AIRES, ARGENTINA, NOVEMBER 2-13, 1998

**PHOTOCOPY
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THE CLEAN DEVELOPMENT MECHANISM

At Kyoto, industrialized and developing nations came together to formulate an innovative, market-based approach to promoting sustainable development and providing cost-effective reductions of greenhouse gas emissions. The Clean Development Mechanism (CDM) is a win-win proposition in which industrialized countries or their companies could earn emissions credits while developing countries acquire technology and capital and earn emission credits that could be banked or sold.

How CDM Could Work

The CDM might work as follows: a company from an industrialized country could help build a highly efficient plant in a developing country rather than a less efficient plant previously planned. This would result in emissions reductions below what would have been the case without the project investment. Those reductions would be certified as credits and the developing nation and investing company would then determine how to share the credits. The developing country could acquire technology and capital investment as well as a share of credits it could sell or bank. The company could acquire a share of credits it could use to meet its emissions reduction commitments at home.

Benefits of the CDM

- **Promotes Sustainable Development.** The CDM will assist in achieving sustainable development by providing an incentive for investments in developing countries, helping those countries get on a path toward cleaner energy and economic growth.
- **Encourages Meeting Environmental Goals.** The CDM, in combination with emissions trading and joint implementation, will allow developed countries to secure the most cost-effective emissions reductions wherever they may be found.
- **Spurs Technology Investment.** The CDM promotes the diffusion of climate-friendly technologies and creates a worldwide market for them.
- **Helps Meet the Costs of Adaptation.** Finally, the CDM will aid those countries that are most vulnerable to climate change since, under the Protocol, a "share of the proceeds" from qualifying projects is to be used to assist those countries in meeting the costs of adaptation.

Next Steps

The U.S. is committed to working with the international community to develop operational rules as quickly as possible, especially in view of the Protocol provisions allowing CDM activities to begin as early as 2000. The Parties need to work through a number of issues relating to how the CDM will function, including determining rules for baselines, verification, institutional structures and allocation of project proceeds. Work on these issues will begin at Buenos Aires and should be guided by the following key principles:

- The CDM should assist developing countries in achieving sustainable development;
- The CDM should be a flexible, market-based mechanism that ensures cost-effective reductions through public and private sector investment in clean energy and carbon sequestration projects;
- The CDM should help ensure compliance with targets and be based on principles of efficiency, transparency and accountability; and
- Wherever possible, the CDM should use existing institutions to streamline the process.

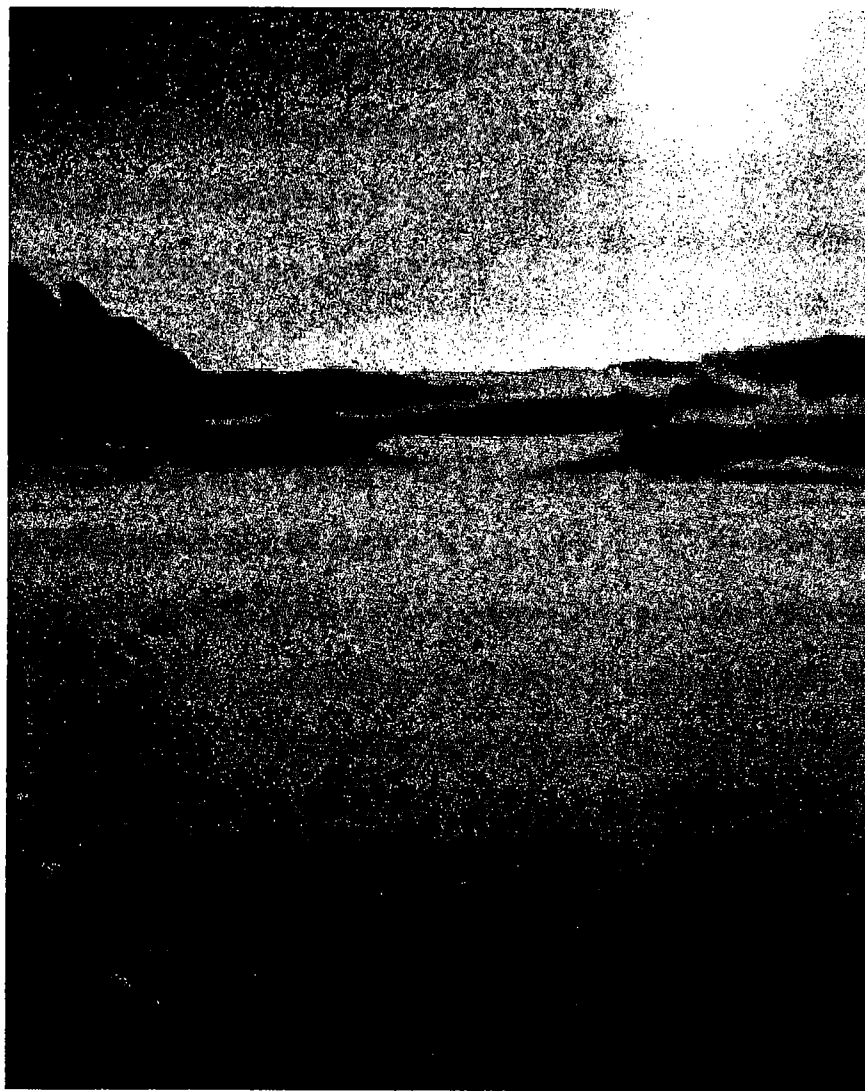
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Climate Change 2

After Kyoto—The U.S. Position
Sources of Information

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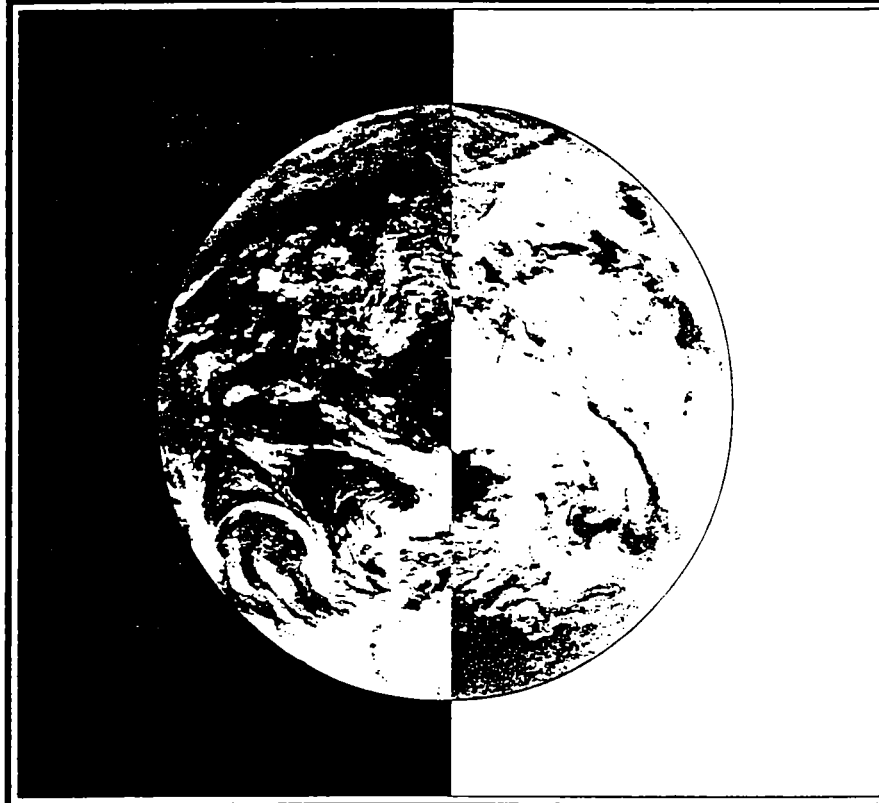
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CLIMATE CHANGE

State of Knowledge



CLIMATE CHANGE



INITIATIVE
1998-2002

United States Agency for **USAID** International Development



Executive Summary

Global climate change poses profound threats to international economic development and ecological balance. The greatest costs will be borne by poor nations least able to cope with crisis and adapt to change.

Speaking at the United Nations (U.N.) General Assembly Special Session on Environment on June 27, 1997, President Clinton announced that the United States would provide \$1 billion over the next five years to collaborate with developing nations and countries in transition in reducing the threat of climate change. That announcement signaled the United States' renewed commitment to facilitate technology transfer and help developing and transition countries to meet the spirit and obligations of the United Nations Framework Convention on Climate Change (FCCC). The President's announcement included three components: a minimum of \$750 million in grant assistance over the next five years, up to \$250 million in "climate-friendly" investment stimulated through the use of credit instruments, and a \$25 million inter-agency climate change program. This document — focusing on the first two components, which comprise the United States Agency for International Development's (USAID) Climate Change Initiative — outlines the steps USAID will take to make the President's commitment a reality.

Climate Change and Developing Nations

Changes in the global climate could affect all sectors of the global economy and all realms of the natural environment. The impact will vary from country to country and region to region; different sections of nations will be affected differently and at different times. It is expected that the impacts of global climate change will, however, be felt most by many of the countries that have contributed least to the problem. Developing nations and transition countries will face the greatest risks for a variety of reasons, including the fact that many of these nations are low-lying or island states, have limited water resources, have economies that are highly dependent upon natural resources and agriculture, or have limited capacity or means to adapt to and cope with change.

At the same time that developing nations are most vulnerable to climate change, their contribution to emissions is growing. While annual emissions from industrialized countries represent over half of global greenhouse gas emissions, the growth in emissions from developing nations is accelerating. If current growth trends continue, in 2035, developing countries will account for almost half of annual emissions from industrial sources.

Strategies for addressing climate change must strive to reconcile social and economic aspirations with the need to address local and global environmental threats. At the same time, efforts to promote development need to incorporate programs that help nations decrease vulnerability to climate change.

Climate change will almost certainly increase the need for international collaboration and humanitarian relief around the world. The challenge will be to ensure that efforts to mitigate and adapt to climate change are not compromised by the demands for emergency relief. As more and more resources are expended to deal with the human costs of climate change, the ability of societies and the international community to address root causes of emissions and foster long-term adaptation may be compromised.

The Role of USAID and the Objectives of the Climate Change Initiative

As the development assistance arm of the U.S. Government, USAID has a critical role to play in working with developing nations to reduce the rate of growth in emissions of greenhouse gases and decrease the threat climate change poses to sustainable development. This overview of the Climate Change Initiative outlines the strategy USAID will use to address

comprehensively the climate change threat. The underlying principle of the Initiative is that efforts to reduce greenhouse gas emissions and vulnerability to climate change will be critical if USAID is to promote development that is sustainable. In the long-term, economic development will be enhanced, not compromised, by efforts to reduce greenhouse gas emissions. In the immediate term, there is a vast array of activities that can promote economic development, reduce the rate of growth in net greenhouse gas emissions and decrease vulnerability to climate change.

Using the Climate Change Initiative as a starting point, USAID will promote sustainable development that minimizes the associated growth in greenhouse gas emissions and vulnerability to climate change. The Agency will undertake activities that are “win-win”—simultaneously promoting sustainable development and combating climate change. USAID will examine its full range of programs to see how efforts to promote development may affect and be affected by climate change. By applying a climate change “filter” when developing and implementing programs, USAID hopes to be able to better promote development that is truly sustainable.

While the U.S. commitment to dedicate at least \$1 billion to address global climate change is significant, USAID recognizes that those resources are far less than what will be required to address the climate change threat. USAID will strive to serve as an effective catalyst, focusing on leveraging and fostering the involvement of other bilateral and multilateral donors, international financiers, the public and private sectors, and non-governmental organizations. The Agency’s success will be in part measured by the extent to which others actively engage.

An Overview of the Initiative

The Climate Change Initiative represents a significant commitment on the part of the U.S. Government in several ways. Most basically, it will ensure a substantial financial commitment to climate change-related programs in developing and transition nations over the next five years and will result in the commitment of an additional \$250 million to foster “climate-friendly” investment in developing and transition countries. The Initiative also will have a significant impact on the Agency’s approach to foreign assistance; it will foster a broader vision of development assistance that recognizes that reducing the climate change threat is central to successfully promoting sustainable development. Finally, the Initiative will strengthen the U.S. Government’s ability to measure the global impact of its foreign assistance program, focus and prioritize efforts on the basis of global imperatives, enhance donor community involvement, and demonstrate a U.S. commitment to assist and collaborate with developing nations under the FCCC

Under the USAID Climate Change Initiative, the Agency will concentrate resources and attention on a set of countries and regions selected because of their contribution (and predicted future contribution) to net global greenhouse gas emissions and/or their governments’ receptivity to taking concrete action. Nine countries and three regions will receive priority: Brazil, Central Africa (Cameroon, the Central African Republic, the Republic of Congo, the Democratic Republic of Congo Equatorial Guinea and Gabon), Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama), Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan), India, Indonesia, Mexico,

Philippines, Poland, Russia, South Africa and Ukraine. Although China is a major emitter of greenhouse gases, USAID currently does not operate in China.

The Initiative specifies three areas of emphasis:

- Decreasing the rate of growth in net greenhouse gas emissions by decreasing greenhouse gas sources and maintaining or increasing greenhouse gas sinks
- Increasing developing and transition country participation in the FCCC
- Decreasing developing and transition country vulnerability to the threats posed by climate change

1. Decreasing the rate of growth in net emissions

In the energy sector, USAID will focus on activities that result in the following improvements in the energy sector:

- Substitution of less carbon-emitting fuel sources
- Use of non-fossil renewable energy sources
- Increased efficiency in power generation transmission and distribution
- Increased end-use energy efficiency
- Decreased use or increased combustion efficiency of carbon-emitting fuels in transportation
- Substitution of less carbon-emitting fuels in transportation
- Reduced market barriers to and increased incentives for more environmentally sound power sector investment

In the land-use sector, USAID will pursue activities that either increase the storage of carbon in ecosystems or land-use systems

(act as carbon “sinks”), or decrease the release of carbon stored in biomass due to human activities. USAID will engage in activities that result in the following:

- The preservation, re-establishment or more sustainable management and use of forests, trees and denuded lands
- The maintenance and preservation of wetlands and mangroves
- Decreased burning of savanna, rangeland, forest and brushland
- Increased agricultural productivity to stabilize the agricultural frontier
- Increased soil organic matter and decreased soil erosion
- Increased use of biofuels
- Improved animal husbandry

In urban areas and industry, USAID will complement efforts to reduce emissions that result from energy supply and use with programs that result in:

- Increased capture of methane from urban sewage and solid waste
- Increased industrial and municipal adoption of environmental management systems
- Regulatory frameworks and credit mechanisms that facilitate environmental investments
- Increased industrial and municipal investments in clean technologies
- More environmentally sound infrastructure
- More environmentally sound urban transportation systems

2. Increasing developing and transition country participation in the goals of the FCCC

Participation in the negotiation and implementation of the terms and spirit of the FCCC will be fundamental to finding a global solution to

climate change. The U.S. Country Studies Program and the U.S. Initiative on Joint Implementation (USIJI), two inter-agency U.S. Government climate change programs, are important vehicles for collaborating with developing nations. In consultation with the inter-agency process, USAID will seek to enhance developing and transition country participation in the FCCC by facilitating:

- Creation of national emissions inventories, baselines and budgets, national action plans and national communications
- Enhanced capacity to track, monitor, report and verify greenhouse gas emissions and project baselines
- Enhanced capacity to monitor and project vulnerability to climate change
- Public-private partnerships that transfer environmentally sound technologies that mitigate climate change
- Developing country acceptance of greater commitments under the FCCC
- Stimulation of joint implementation (JI) projects and participation in other flexible market mechanisms
- Establishment of legislative, regulatory and market structures, and local capacity to participate in emissions trading regimes in appropriate countries
- Integration of climate change concerns into national sustainable development strategies
- Increased capability to model the micro and macro economic effects of climate change

3. Decreasing vulnerability to the threats posed by climate change

Given its broad experience in development, USAID is uniquely positioned to help increase the capacity of developing countries and countries in transition to adapt to change and cope with the predicted impacts of climate

change. Programs that have the following results will be an integral part of the Agency's climate change strategy:

- Increased preparedness for natural disasters
- Increased adaptability and efficiency of agricultural systems, municipal management, water resources management and public health systems
- Maintenance of healthy, resilient ecosystems
- Improved domestic and international capacities for conflict-resolution regarding shared resources, such as water

To achieve the results outlined above USAID will use a range of tools and approaches, including policy reform, institutional capacity building, education and outreach, and information collection and dissemination. USAID also will place particular emphasis on four additional tools: technology cooperation; partnerships with the private sector; collaboration and coordination with other bilateral and multilateral donors; and the use of loans and loan guarantees to foster private trade and investment in environmentally sound technologies and projects that mitigate climate change.

USAID will work with a wide range of public, private and non-government partners in implementing the Initiative. In addition to USAID's developing country partners, collaborators will include other agencies and departments of the U.S. Government, multilateral development banks, other multilateral and bilateral donors, and public, private and non-governmental organizations throughout the world.

Through the Initiative, USAID will highlight several new areas of emphasis including the following:

- Quantifying the health and productivity costs associated with local air pollution that fossil

fuel combustion generates in an effort to expand the definition of "win-win" efforts to decrease greenhouse gas emissions.

- Analyzing the specific regional and local vulnerabilities climate change poses. This study will be used to identify areas of particular vulnerability that USAID needs to address.
- Facilitating private sector transfer of clean energy technology to key countries and regions; a first step in this direction is the promulgation of model "Global Climate Change Technology Cooperation Agreements (TCAs)" with key countries.
- Reducing the vulnerability of urban populations, property and infrastructure to the threats posed by climate change.
- Enhancing environmental education and outreach to involve non-governmental organizations, the private sector and governments in efforts to promote development while reducing the rate of growth in net greenhouse gas emissions.
- Working with the donor community to promote, more effectively, development that minimizes the growth in greenhouse gas emissions.

While the commitment of \$1 billion over five years is significant for the U.S. Government, it is a small share of the resources necessary to minimize the threats climate change poses to developing and transition countries. A concerted global effort will be required. The creation of close partnerships with a variety of actors will be critical to the success of the Climate Change Initiative. USAID will work with multilateral and bilateral donors, international organizations, the private sector, and other agencies and departments of the U.S. Government. By intensifying coordination, USAID will multiply the impact of its programs, and increase the pace and durability of reforms in partner nations.

USAID Management of the Climate Change Initiative

USAID programs are designed and implemented in collaboration with developing nations to target local priorities and develop locally appropriate solutions. The Climate Change Initiative provides a framework and a set of priorities upon which activities will be designed and implemented. Programs under the Initiative will combine an emphasis on meeting local needs with a greater focus on global goals and objectives. Activities will be developed in partnership with beneficiaries to address local priorities while combating the rate of growth in net emissions of greenhouse gases.

USAID will form a Climate Change Committee to make proposals and decisions over issues of policy related to implementation of the USAID Climate Change Initiative. The Committee will include representatives from each bureau within USAID. An Agency-wide Climate Change Team will continue to serve as the locus for information sharing on programming, current events, results reporting and USAID collaboration with other Agencies and development partners.

Consistent with its role as Agency technical representative on climate change, the USAID Global Bureau Center for Environment will continue to facilitate the Climate Change Team, and serve as USAID representative to all inter-agency climate change programs. The USAID Policy and Program Coordination Bureau will continue to oversee the consistent application of policy on climate change Agency-wide, and ensure that climate change receives a high level of attention in efforts to collaborate with other donors. The USAID Bureau for Management will ensure that obligations are commensurate with fulfilling the President's commitment.

Budget

The obligation of resources under the USAID Climate Change Initiative will be focused on mitigating net greenhouse gas emissions, and fostering developing and transition country participation in the FCCC. USAID obligations as part of the Initiative will include at least \$750 million in grant assistance, and upon meeting Congressionally mandated management reforms, the use of credit tools to leverage at least \$250 million in additional climate change-related trade and investment. A minimum of \$150 million per year will be obligated by the Agency for climate change-related activities in each of the next five years. Of the total \$750 million in climate change-related grant assistance, at least 40 percent will be obligated to programs in the Agency's key climate change countries and regions. A significant additional percentage will be obligated to the Agency's program in Egypt. Climate change-related programs in other USAID assisted countries will fulfill the remainder of obligations as part of the Initiative. At least two-thirds of the investment USAID stimulates through the use of credit instruments as part of the Initiative also will be focused on USAID key climate change countries and regions.

Monitoring and Measuring Results

Monitoring and measuring the results achieved will be among the Agency's highest priorities. Under the Initiative a concerted effort will be made to measure the impact of programs, assess the most effective strategies for combating the threat of climate change, and hone and focus the Agency's approach. The Initiative builds on the Agency Objective for climate change which will be used to track programs and obligations. USAID has begun development of its climate change results monitoring plan, and reporting will begin at the end of FY 1998.

Organization of the Report

The first section of this document summarizes the state of knowledge regarding climate change, its underlying causes, and likely impact on developing and transition countries. It identifies population growth, economic development, urbanization and technology as contributors to growing net greenhouse gas emissions, and reviews the predicted impact of a warmer world on human health, freshwater

resources, biodiversity, coastal zones, infrastructure and political systems. The second section discusses the relationships between global climate change and development assistance. The third section describes the Agency's strategy to combat the threat of climate change and the approach USAID will use to implement the President's commitment. The final chapter outlines USAID's proposed management plan for the Initiative.

EXECUTIVE SUMMARY OF U.S. DOMESTIC CLIMATE CHANGE PROGRAM

N O V E M B E R 1 9 9 8

"The vast majority of the world's climate scientists have concluded that if the countries of the world do not work together to cut the emission of greenhouse gases, then temperatures will rise and will disrupt the climate. In fact, most scientists say the process has already begun. [Today], I'm announcing a far-reaching proposal that provides flexible market-based and cost-effective ways to achieve meaningful reductions here in America. I want to emphasize that we cannot wait until the treaty is negotiated and ratified to act."

--President Clinton, October 22, 1997

PRESIDENT CLINTON'S OCTOBER 1997 PLAN

In October 1997, President Clinton outlined an environmentally and economically sound plan for reducing U.S. greenhouse gas emissions. This plan emphasizes win-win initiatives designed to cut emissions by increasing energy efficiency; develops new, cleaner energy technologies; works with industry and others to promote sensible solutions; and employs market-based mechanisms to ensure cost-effective reductions. The President's plan will prepare the United States to step up to the challenge of meeting the target set forth in the Kyoto Protocol (greenhouse gas emissions 7% below 1990 levels during the commitment period 2008-12)—once it is ratified by the United States.

Time and again the United States has faced environmental challenges that skeptics claimed would be impossible to solve without threatening the economy. Yet time and again, the ingenuity and creativity of U.S. businesses and consumers have shown that these challenges could be met with greater speed and less economic cost than anyone could have predicted. President Clinton's sensible domestic climate change program will allow for continued economic growth even as we begin to address one of the great environmental challenges of the 21st century. As awareness of the climate change challenge and its importance grows among U.S. businesses and consumers, private responses to the President's broad policy directions can be expected to accelerate.

Important elements of President Clinton's plan include:

- **Tax incentives and R&D.** The President's plan includes the Climate Change Technology Initiative (CCTI)—a vigorous program of tax cuts and research and development aimed at improving energy efficiency and spurring the use of renewable energy sources. The package amounts to an additional \$6.3 billion over 5 years (\$3.6 billion in tax cuts and \$2.7 billion in

new investment)—over and above what was planned already for climate change-related investments. The President recently signed the Fiscal Year 1999 appropriations bills, which include over \$1 billion for investments that will improve U.S. energy efficiency—a 26% increase over last year.

- The **investment package** stimulates research and development in the major carbon-emitting sectors of the economy—buildings, transportation, and industry. Among projects to be expanded are the Partnership for a New Generation of Vehicles, a government-industry effort to develop highly efficient cars, and the Partnership for Advancing Technology in Housing, aimed at cutting energy use in new homes by 50% and in retrofitted homes by 30%. Substantial funds also will be invested in research partnerships for key renewable energy technologies such as wind, photovoltaics, geothermal, biomass, and hydropower to reduce prices and improve performance
- The **tax incentive package** includes a tax credit of up to \$4,000 for consumers who purchase highly efficient vehicles; a tax credit of up to \$2,000 for energy-efficient new homes; a 15% tax credit (with a \$2,000 cap) for rooftop solar equipment; a 20% tax credit (subject to a cap) for energy-efficient building equipment for homes and offices; a 10% tax credit for investment in combined heat and power systems; and an extension of a current tax credit of 1.5 cents a kilowatt hour for the production of electricity from wind and biomass.
- **Industry consultations.** A second component of the President's plan aims at building sector-by-sector partnerships with key energy-intensive industries to encourage voluntary efforts to cut emissions. These partnerships will identify opportunities for working together to remove barriers to the development and widespread use of energy-efficient technologies and practices. As part of these consultations, the Administration will discuss ways to ensure credit for businesses that act early.
 - High-level Administration officials already have met with top management of the following industries: aluminum, cement, publicly-owned and investor-owned electric utilities, forest products, gas pipelines, and steel. Meetings also have occurred with officials from a number of other key industries, including: airlines and aerospace, agriculture, chemicals, commercial real estate, electronics/semi-conductors, glass, residential housing, metal casting, and oil. More meetings will follow in the months to come.
 - On May 4, President Clinton announced an important new partnership with the homebuilding sector—the **Partnership for Advancing Technology in Housing (PATH)**. This partnership is designed to build new homes that are 50% more energy-efficient within a decade and to retrofit at least 15 million existing homes within a decade to make them 30% more energy efficient. Meeting PATH goals would reduce annual carbon emissions in 2010 by an amount equal to nearly 24 million metric tons (MMTCE)—the amount produced by some 20 million cars—and would save consumers \$11 billion a year in energy costs by 2010
- **Electricity restructuring.** Another core element of the President's plan involves restructuring the electricity industry in a manner that will reduce greenhouse gas emissions while cutting consumers' energy bills. The Administration's restructuring proposal includes a requirement that utilities open up their distribution and transmission wires to all qualified sellers; a renewable portfolio standard to increase the use of electricity from renewable sources to at least 5.5% of

sales by 2010; a \$6 billion/year Public Benefits Fund to spur greater investment in energy-efficiency and renewable energy technologies; and a green labeling requirement to inform consumers about their clean energy options. This plan is projected to reduce carbon emissions by roughly 25 to 40 MMTCE in 2010 while saving consumers at least \$20 billion a year on their electricity bills.

- **Federal energy use and procurement.** The President's plan also includes making substantial reductions in the Federal government's own greenhouse gas emissions by improving the energy efficiency of Federal facilities and activities and by reforming procurement practices. These actions are important in their own right, since the Federal government is the nation's largest single energy user, but also they can set an important example for the private sector. In July, the President announced the first 4 elements of his federal energy plan.
 - **Energy Savings Performance Contracts (ESPCs).** The President directed all Cabinet agencies to expand the use of ESPCs. Under an ESPC, a Federal agency hires contractors to audit facilities; propose energy-saving retrofits; and privately finance, install, and maintain retrofits. Contractors are paid from a share of the savings, and the remainder of savings are returned to the taxpayers and agency. Expanded use of ESPCs can reduce greenhouse gas emissions by over 2 MMTCE/year, reduce Federal energy use 30% below 1985 levels by 2005, and save as much as \$700 million/year.
 - **Federal Lighting.** The Federal government will seek to purchase and install an additional 300,000 high-efficiency compact fluorescent light bulbs over the next 3 years. This will prevent emissions equal to 40,000 metric tons of carbon (MTCE) over the life of the bulbs and generate electricity cost savings of \$13.5 million.
 - **Federal ENERGY STAR® Buildings.** The President directed all agencies to take the steps needed to bring existing Federal buildings up to the ENERGY STAR® standards (top 25% in energy efficiency).
 - **Sustainable Design in New Federal Buildings.** The Department of Defense and 6 other Federal agencies will adopt "sustainable design" standards in all new buildings. "Sustainable design" is an integrated approach reflecting an increased commitment to environmental stewardship and conservation, including energy-efficient and environmentally preferable practices, products, and services.

In the coming months the President is committed to directing further efficiencies in Federal energy management, such as enhancing the procurement of energy-efficient equipment, spurring increased use of alternative fuels and vehicles, and expanding renewable technology use by Federal agencies.

- **Domestic emissions trading.** The President has proposed a domestic emissions trading system to begin by 2008. Emissions trading would harness the power of the market to achieve a national greenhouse gas target at the lowest possible cost. The United States has used emissions trading successfully to reduce the pollution that causes acid rain—exceeding environmental objectives at about 50% below the expected cost.
- **Scientific research.** The Administration is continuing strong support for the U.S. Global Change Research Program. This program is focused on increasing our knowledge of the timing and regional patterns of expected climate changes, the combined effects of natural variation and

human actions, and the vulnerability of natural resources. A strong foundation of peer-reviewed science results will support sound policy making and the evaluation of actions taken to confront the challenge of climate change.

PROGRAMS PREDATING THE PRESIDENT'S OCTOBER 1997 PLAN

In 1993, following The United States' ratification of the Framework Convention on Climate Change, President Clinton launched the Climate Change Action Plan (CCAP). The CCAP focuses on promoting voluntary initiatives across a wide array of industries and sectors of the economy to reduce greenhouse gas emissions. Among the ongoing programs undertaken pursuant to the CCAP are:

- ***Partnership for a New Generation of Vehicles (PNGV).*** This initiative is a government-industry effort to develop cars that have 3 times the fuel efficiency (one-third the greenhouse gas emissions) of today's autos. Meeting this goal would mean that the typical midsize car would have an efficiency of 80 miles per gallon. This year all 3 major U.S. automakers announced concept vehicles that go far in advancing these objectives. The President's Climate Change Technology Initiative proposes increased funding for PNGV and also includes tax credits to stimulate the early introduction of new generation automobiles and light trucks. Substantial increases in funding for PNGV were included as part of the Fiscal Year 1999 appropriations bills recently signed into law.
- ***Climate Challenge.*** This program is a joint, voluntary effort between the Department of Energy (DOE) and the electric utility industry to reduce, avoid, or sequester greenhouse gases. Utilities identify and implement cost-effective activities that are specified in agreements between the Federal government and individual electric utilities. Under this program, the electric utility industry as a whole also has developed 9 industry-wide initiatives to research, develop, and promote technologies and practices that lower greenhouse gas emissions. Currently, Climate Challenge's partner utilities now number over 600 and represent 71% of the U.S. 1990 electric generation and utility carbon emissions. It is estimated that pledged Climate Challenge partners' actions will reduce emissions by 47 MMTCE in 2000.
- ***Climate Wise.*** This program gives technical assistance to over 450 individual manufacturing companies that have entered into partnership agreements with the Federal government to reduce greenhouse gas emissions, increase productivity, and save money. Companies submit comprehensive action plans that identify specific steps they will undertake between the time they enter into the compact and 2000. In 1997, Climate Wise partners prevented emissions equal to more than 8 million metric tons of carbon (MMTCE) and saved \$80 million on their energy bills. By 2000, it is estimated that Climate Wise partners will reduce emissions by more than 9.5 MMTCE and cut energy costs by more than \$350 million.
- ***Industries of the Future.*** This program works with the nation's most energy-intensive industries to focus cooperative research on increasing energy and resource efficiency. Industries that have signed partnership agreements include: metal casting, aluminum, forest products, steel, chemicals, mining, and plant/crop-based renewable resources. It is estimated that partners will prevent emissions of 25 MMTCE by 2010 and realize a \$4 billion savings in energy costs.
- ***Million Solar Roofs.*** This initiative aims to place solar energy systems on 1 million roofs across the United States by 2010. After just 1 year, commitments already have been received for a half million systems. In June, a new private sector partnership was announced to provide homeowners

U.S. DOMESTIC CLIMATE CHANGE PROGRAM (continued)

ers with low-cost loans for rooftop solar systems and to help meet the program's goal. The President's CCTI includes \$12 million in funding for this initiative, as well as \$120 million in tax credits. Substantial increases in funding were included as part of the Fiscal Year 1999 appropriations bills recently signed into law. Meeting the program's goal will reduce carbon emissions equivalent to the annual emissions from 850,000 cars.

- **Motor Challenge.** Motor Challenge, Steam Challenge, Combined Heat and Power Challenge, and Compressed Air Challenge are a group of voluntary program initiatives aimed at improving energy efficiency in U.S. manufacturing plants by breaking down market barriers to the development and diffusion of energy-efficient technologies and practices. These 4 programs offer a variety of technical assistance, tools, and information to industry. By 2015, the 4 initiatives are expected to reduce emissions by 20 MMTCE and will generate \$3 billion in annual cost savings.
- **Energy-efficiency Standards for Equipment and Appliances.** To save energy and reduce consumer utility bills, the U.S. Government develops test procedures and national minimum energy-efficiency standards for equipment and appliances, such as heating and cooling equipment, water heaters, lighting, refrigerators, clothes washers and dryers, and cooking equipment. Through 1997, residential appliance standards have avoided cumulative emissions of 30 MMTCE and saved consumers a cumulative \$10.5 billion. By 2010, the currently enacted standards cumulatively will have avoided cumulative emissions of 150 MMTCE and saved consumers \$33 billion.
- **ENERGY STAR® Products.** The ENERGY STAR® Products program allows manufacturers of select energy-efficient products to promote their products with an "ENERGY STAR®" label. This allows consumers to easily identify products that help the environment and save energy and money. Over 3,000 highly efficient ENERGY STAR® product models currently are available to consumers, ranging from computers to refrigerators to central air-conditioning units. Accompanied by a national consumer education campaign, the ENERGY STAR® program prevented emissions of 2 MMTCE—the equivalent of more than 1.5 million automobiles—and saved consumers more than \$740 million in 1997. By 2010, the full program is expected to prevent emissions of 23 MMTCE and generate cost savings of \$10 billion.
- **ENERGY STAR® Buildings and Green Lights.** The ENERGY STAR® Buildings and Green Lights Partnership encourages individual building owners, developers, and managers to install energy-efficient lighting and undertake a 5-stage strategy to capitalize on system interactions that maximize energy savings at minimum cost. Commercial and Federal buildings that are in the top 25% in energy efficiency qualify for an "ENERGY STAR® Buildings" label. Among the major buildings that already have signed up for the program are the Empire State Building, the World Trade Center, and Chicago's Sears Tower.

To date, ENERGY STAR® Buildings and Green Lights have established partnerships with over 2,600 organizations that have upgraded the lighting in 3 billion square feet of commercial building space, preventing emissions equal to more than 1 MMTCE in 1997 alone and saving themselves over \$500 million on their annual energy bill. In 2010, the full ENERGY STAR® Buildings and Green Lights Partnership is expected to prevent emissions of 23.9 MMTCE and generate energy cost savings of \$11.4 billion.

- **Voluntary Aluminum Industrial Partnership (VAIP).** This partnership between the U.S. Government and the U.S. domestic aluminum industry seeks to reduce perfluorocarbon (PFC) (an extremely potent greenhouse gas) emissions while increasing the efficiency of primary aluminum production. Since the VAIP was launched in April 1995, membership has grown to include 11 of the nation's 12 primary aluminum producers, representing 22 smelters and 94% of U.S. production capacity. In 1996, partners reduced their emissions by 1.45 MMTCE. VAIP partners cumulatively have committed to reducing PFC emissions by 45% from 1990 levels by 2000—equal to 2.2 MMTCE.
- **WasteWi\$e.** WasteWi\$e works with American businesses; federal, state, local, and tribal governmental agencies; and other institutions to reduce municipal solid waste. Presently, more than 800 organizations are WasteWi\$e partners. Waste reduction activities reduce greenhouse gas emissions in several ways, including energy savings, increased carbon sequestration, and avoided methane emissions. In 1997 alone, the combined waste reduction results of WasteWi\$e partners prevented emissions of 5 MMTCE—equivalent to the average annual emissions from electric power consumption of roughly 3.0 million households.
- **Methane Reduction Programs.** The U.S. Government administers a variety of industry-government voluntary partnerships that significantly reduce U.S. methane emissions from a variety of sources: the Landfill Methane Outreach Program, the Coalbed Methane Outreach Program, Natural GasSTAR, AgSTAR, and the Ruminant Livestock Efficiency Program. In each case, the programs encourage the profitable collection and use of methane, as opposed to its release to the atmosphere. In 1997, participants in the programs reduced methane emissions by 3.7 MMTCE—equivalent to the emissions from more than 3 million automobiles. By 2010, these programs are expected to avoid 22 MMTCE of methane emissions.
- **Energy Smart Schools.** This national partnership brings together public and private sector resources to cut energy bills in schools and reinvest the savings in students and their education. The program will work with primary and secondary school systems to reduce energy use, energy costs, and greenhouse gas emissions. It is estimated that a 25% reduction in schools' energy use will cut annual U.S. greenhouse gas emissions by 3-4 MMTCE.
- **Bioenergy.** The U.S. government administers a variety of programs, in partnership with industry, on the research, development, and deployment of bioenergy resources and technologies, including electricity production, fuels for transportation, and industrial processing and manufacturing. These programs provide both federal tax incentives and funding for R&D and demonstration projects to encourage the use of biofuels. Currently, bioenergy is one of the leading renewable energy technologies in the United States—accounting for 3-4% of primary energy consumption—and one of the few technologies that can recycle and sequester carbon.
- **Carbon Sequestration in Agriculture and Forestry.** Carbon sequestration and carbon "sinks" will play a critical role in helping the world meet the challenge of climate change. Recently, there has been an intensified focus and greater understanding of how agriculture and forestry practices can greatly affect the ability of farmland and forests to sequester carbon and help mitigate climate change effects. As a result, the U.S. Government has begun to analyze the net carbon effects of its various conservation and environmental programs and to determine how they can be enhanced and expanded to foster greater sequestration. In general, these programs assist farmers, ranchers, and other landowners in conserving and improving soil, water, and other natural resources associated with rural land.

U.S. DOMESTIC CLIMATE CHANGE PROGRAM (continued)

- **State and Local Climate Change Program.** The State and Local Climate Change Program helps states and communities reduce greenhouse gas emissions by providing guidance and technical information to help prepare inventories of their greenhouse gas emissions, assess and build awareness of the impacts of climate change, and develop action plans to reduce emissions. The program also provides technical and financial assistance to help states integrate climate change initiatives with existing state programs. Based on initial estimates, the program will help reduce U.S. greenhouse gas emissions by 1.9 MMTCE in 2000 and 4.2 MMTCE in 2010.
- **U.S. Country Studies Program.** This program provides financial and technical assistance to developing countries and countries with economies in transition in addressing the problem of global climate change, particularly within the context of the U.N. Framework Convention on Climate Change (UNFCCC). Since 1993, funding for the Country Studies Program has totaled \$40 million. The program assists countries to: inventory their emissions of greenhouse gases; assess their potential vulnerability to climate change and approaches for adapting to such change; identify and evaluate options for controlling these gases or increasing sinks; develop national plans for responding to climate change; assess related technological needs; and increase public understanding of climate change.

(Because of the interaction effects of programs designed to reinforce each other, it would not be appropriate to add together emissions reductions estimates for all programs listed above to arrive at an estimate of total U.S. reductions. Furthermore, there is a substantial amount of uncertainty associated with any of these projections because the estimates attempt to quantify projected technology adoption more than a decade into the future.)

FACT SHEET ON CLIMATE CHANGE TECHNOLOGY INITIATIVE

N O V E M B E R 1 9 9 8

An important component of the President's October 1997 plan to reduce U.S. greenhouse gas emissions is the **Climate Change Technology Initiative (CCTI)**—designed to provide an additional \$6.3 billion over 5 years of tax incentives and research and development investment to stimulate the development and use of energy-efficient technologies, clean energy sources, and carbon sequestration. The CCTI builds and expands upon an existing foundation of advanced science, basic research, and government-industry partnership. It will increase U.S. competitiveness, reduce U.S. dependence on foreign oil, help maintain U.S. leadership in energy technology, and reduce greenhouse gas emissions at the same time. In response to the CCTI, the Fiscal Year 1999 appropriations bills recently signed into law by the President include over \$1 billion for investments that will improve U.S. energy efficiency—a 26% increase over last year.

\$2.7 billion in new R&D investment. The CCTI contains \$2.7 billion over the next 5 years in additional research and development spending—covering the 4 major carbon-emitting sectors of the economy (buildings, industry, transportation, and electricity), plus carbon removal and sequestration, Federal facilities, and cross-cutting analyses and research. Selected examples of the R&D effort include:

- **Partnership for a New Generation of Vehicles (PNGV).** Government-industry effort to develop safe, attractive, affordable cars that get up to 3 times the fuel efficiency of today's cars. Similar efforts are underway to develop cleaner, more efficient diesel engines for both light trucks and heavy trucks.
- **Partnership for Advanced Technologies in Housing (PATH).** Partnership with the homebuilding industry to develop, demonstrate, and deploy housing technologies and practices that are inexpensive, highly efficient, and attractive to consumers. PATH's goal is to build new homes that are 50% more energy efficient within a decade and to retrofit at least 15 million existing homes to make them 30% more energy efficient.
- **Industries of the Future.** Research partnerships with energy-intensive industries focused on increasing energy and resource efficiency. Increased funding will permit expansion of the program to include 2 new industry sectors—mining and agriculture. Package also includes increased funding for Motor Challenge, which focuses on saving energy through better motor technology.
- **Million Solar Roofs.** Increased funds for DOE cost-reduction R&D for solar thermal and rooftop PV systems to help meet the President's goal of placing solar installations on 1 million roofs over the next 10 years. Million Solar Roofs will establish partnerships with communities, builders, and other Federal agencies to promote the use of building-mounted solar systems.
- **Bioenergy.** Increased funds for accelerated deployment of rural bioenergy projects that will provide the power industry with opportunities to produce electricity with very low net greenhouse gas emissions while giving farmers an alternative market for crops.
- **Wind Power.** Increased funds for the development of the next generation of wind turbines, which have the potential to make wind power cost-competitive with natural gas.

CLIMATE CHANGE TECHNOLOGY INITIATIVE (continued)

\$3.6 billion in tax credits. The CCTI also contains \$3.6 billion over the next 5 years in tax cuts for purchases of energy-efficient and renewable energy technologies.

- ***Tax credits for fuel-efficient cars.*** Includes tax credits of \$3,000 to \$4,000 for consumers who purchase highly fuel-efficient vehicles.
- ***Tax credits for rooftop solar systems.*** Provides a 15% credit (up to \$2,000) for purchases of rooftop solar electricity and hot water systems.
- ***Other tax credits for energy efficiency.*** Includes a \$2,000 credit for purchasing energy-efficient new homes; a 20% credit (subject to a cap) for purchasing energy-efficient building equipment; a 10% tax credit for investment in combined heat and power systems; and an extension of the current tax credit of 1.5 cents a kilowatt hour for the production of electricity from wind and biomass.

FACT SHEET ON INDUSTRY CONSULTATIONS

N O V E M B E R 1 9 9 8

A key component of the President's October 1997 plan to reduce U.S. greenhouse gas emissions is to build voluntary partnerships with energy-intensive industries to develop strategies to cut emissions. Consultations are identifying opportunities for the development and diffusion of energy-efficient or less carbon-intensive technologies and practices, and, in the case of agriculture and forestry, carbon storage. As part of this process, the Administration actively solicits ideas from industry about how to remove technical and regulatory barriers and foster innovative ways that government can support industry's efforts to reduce net emissions. Consultations also address ways to ensure credit for those businesses that take early action.

HIGH-LEVEL DIALOGUE

Pursuant to the President's initiative, senior White House staff have initiated dialogues with high-level officials from key industries over the past several months on voluntary emissions reductions, including:

- Aluminum
- Cement
- Electric Power
- Forest Products
- Gas Pipelines
- Steel

Initial consultations have begun with officials from a number of other key industries, including: airlines and aerospace, agriculture, chemicals, commercial real estate, electronics/semi-conductors, glass, residential housing, metal casting, and oil. Dialogues with additional key, energy-intensive industries will be initiated in the months to come.

REAL REDUCTIONS

As part of the consultative process, the Administration is encouraging industries to review their current energy practices, conduct emissions inventories, and establish systems for ongoing emissions measurement. The Administration also is encouraging industries to articulate "stretch goals" for emissions reductions and improved energy efficiency and to set forth action plans for achieving these goals.

BUILDING ON WHAT WORKS

The Administration's industry consultations initiative builds on successful voluntary approaches developed under 1993's Climate Change Action Plan (CCAP), including: **Climate Challenge** (partnership program with electric utili-

PARTNERSHIP FOR ADVANCING TECHNOLOGIES IN HOUSING (PATH)

The Administration's dialogue with the home-building sector has produced an important new partnership. PATH, announced in May, seeks to design and build new homes that are 50% more energy efficient within a decade and to retrofit at least 15 million existing homes within a decade to make them 30% more energy efficient. PATH joins government and industry in a coordinated strategy to identify promising housing technologies and swiftly move them to market. Meeting PATH goals would reduce annual emissions equal to nearly 24 million metric tons of carbon (MMTCE)—the amount produced by 20 million cars—and save consumers \$11 billion a year in energy costs by 2010.

INDUSTRY CONSULTATIONS (continued)

ties to reduce emissions); **Climate Wise** (manufacturing partnership program); **Industries of the Future** (cooperative research program with energy-intensive industries); **Voluntary Aluminum Industrial Partnership** (emissions reduction program involving 90% of U.S. aluminum industry); and **Natural Gas STAR** (methane emissions reduction program).

EARLY CREDIT

Consultations with industry and non-governmental organizations have included discussions on how companies can receive credit for actions taken to reduce emissions or increase carbon removal by storage before the start of the first commitment period under the Kyoto Protocol (2008-2012). The President has made clear that he is committed to providing credit for early action, and the Administration will continue working with the private sector on this issue.

FACT SHEET ON PARTNERSHIP FOR ADVANCING TECHNOLOGIES IN HOUSING

N O V E M B E R 1 9 9 8

In May 1998, President Clinton launched a new partnership with America's building industry to improve the energy efficiency of U.S. homes dramatically—cutting consumers' energy bills by 30-50%, while significantly reducing greenhouse gas emissions. Over the next decade, the **Partnership for Advancing Technologies in Housing (PATH)** seeks to cut energy use by 50% in new homes and by 30% in 15 million retrofitted existing homes. By fostering the development and deployment of 21st century housing technologies, PATH has the potential to reduce annual emissions equal to nearly 24 million metric tons of carbon (MMTCE)—the amount produced by some 20 million cars—and save consumers \$11 billion a year in energy costs by 2010.

ADVANCED HOUSING FOR THE 21ST CENTURY

Residential energy use currently accounts for about 20% of U.S. emissions of greenhouse gases. PATH will make possible homes that are stronger, more affordable, and far more energy-efficient. It brings together Federal agencies, state and local governments, and the building, finance, and insurance industries to spur design and construction innovations for the next generation of American housing. Important industry partners that have signed on to this effort include the National Association of Home Builders, the Manufactured Housing Institute, and the Institute for Business and Home Safety.

COLLABORATIVE RESEARCH ON NEXT-GENERATION TECHNOLOGIES

PATH will bring together the best minds of the public and private sectors to develop and evaluate new technologies that can achieve both performance and cost goals. A national Conference on the Future of the American House in 1999 will help set the research agenda. Examples of promising technologies include: ultra-efficient heating and cooling systems, a new generation of windows that provide as much insulation as most walls today, and roof shingles that generate solar power.

PATH PROJECTS AROUND THE COUNTRY

Several major developments around the country—some still in the planning stages, others already underway—will serve as the first PATH pilot projects:

- Los Angeles (186 single-family homes);
- Tucson (2,500 homes);
- Pittsburgh (713 homes); and
- Denver (airport and air base redevelopment).

These pilot sites will begin developing the markets for, and demonstrating the feasibility of, new generation housing technologies. They also will act as training sites for builders and community leaders to learn about the benefits of the technologies and how to use them.

MOVING TECHNOLOGY FROM THE LABORATORY TO THE MARKETPLACE

Because the housing industry is large and dispersed, it can take 10 to 25 years for a new technique or product to gain wide acceptance. PATH aims to cut that time in half by removing market barriers, developing national testing and evaluation standards, and streamlining approval processes. A blue-ribbon panel made up of experts from among PATH members

will investigate regulatory and other barriers. Federal, state, and local organizations are committed to helping remove unnecessary barriers and encourage adoption of cost-effective new technologies. PATH's website (<http://www.pathnet.org>) will help ensure that builders, suppliers, and consumers have access to the latest information about innovative products.

TAX INCENTIVES FOR ENERGY EFFICIENCY

The President's Climate Change Technology Initiative (CCTI) includes \$200 million in tax credits for purchases of ultra-efficient homes and \$1.4 billion in tax credits for energy-saving systems and appliances for buildings and homes. In response to the CCTI, the Fiscal Year 1999 appropriations bills recently signed into law by President Clinton include a substantial increase in funding to build this new partnership as well as increased funding for research and development related to energy-efficient appliances and systems.

FACT SHEET ON ELECTRICITY RESTRUCTURING

N O V E M B E R 1 9 9 8

Restructuring the U.S. electricity sector and opening it up to competitive market forces is a key part of President Clinton's climate change initiative. Enactment of legislation along the lines of the President's Comprehensive Electricity Competition Plan will reduce carbon emissions roughly equal to 25 to 40 million metric tons (MMTCE) in 2010 and save consumers at least \$20 billion a year on their electricity bills.

HOW RESTRUCTURING WOULD WORK

Under electricity restructuring, competition will replace regulation as the primary mechanism for setting electricity generation prices. In the past, U.S. electrical utilities were generally State-regulated monopolies that were permitted to charge customers a regulated rate for electric power based on the cost of production plus a "rate of return" on investment. Under restructuring, electricity generation would become a competitive market, and utilities would be required to open up their distribution and transmission wires to all qualified sellers. At the same time, the actual distribution and transmission of electricity would continue to be regulated because these functions will remain monopolies for the foreseeable future. The system would be restructured, not completely deregulated.

BENEFITS OF COMPETITION

Today, a typical older fossil fuel electricity generator wastes two-thirds of the energy it produces. Monopoly regulation does little to discourage this type of inefficiency. Under restructuring, a generator that wrings as much energy as it can from every unit of fuel will be rewarded by the market. In addition, under restructuring, competitive sellers can be expected to maximize the value of their product offerings by bundling electricity with energy efficiency and management services.

Thus, a more competitive electricity industry will provide immense benefits to both individual U.S. consumers and the U.S. economy as a whole. It will result in a cleaner environment, lower prices, greater innovation and new services, a more reliable power supply grid, and will save the government money.

Cleaner Environment. Restructuring will produce significant environmental benefits through both market mechanisms and policies that promote investment into energy efficiency and renewable energy. The Administration's Competition Plan is projected to reduce greenhouse gas emissions by roughly 25 to 40 MMTCE in 2010. Specific environment-enhancing provisions of the plan include:

- Establishment of a non-hydroelectric **Renewable Portfolio Standard** to ensure that at least 5.5% of all electricity sales include generation from renewable sources by 2010.
- Establishment of a \$6 billion/year **Public Benefits Fund** to provide matching funds to states for energy-efficiency programs, renewable technologies, low-income assistance, and other purposes.
- "Green" labeling to help consumers who value clean energy choose it.
- A **net metering** provision encouraging the installation of small renewable systems.

ELECTRICITY RESTRUCTURING (continued)

Cost Savings. The Administration estimates that retail competition will save consumers at least \$20 billion a year on their electricity bills. This translates into projected savings for the typical family of four of \$232 a year—\$104 of direct savings plus another \$128 of indirect savings arising from the lower costs of other goods and services.

Economic Growth. Competition also will spark innovation in the American economy, creating new industries, jobs, products, and services just as telecommunications reform spawned widespread use of cellular phones and other new technologies. This will further strengthen the U.S. position as the world's most vibrant and dynamic economy.

Fiscal Benefits. Competition is likely to reduce total government spending—federal, state, and local—on electricity by at least 10%, a savings of close to \$2 billion a year, helping governments maintain balanced budgets into the future while meeting critical public needs.

FACT SHEET ON FEDERAL ENERGY EFFICIENCY

N O V E M B E R 1 9 9 8

President Clinton's plan to reduce U.S. domestic greenhouse gas emissions includes an aggressive effort to reduce the Federal government's own emissions by improving the energy efficiency of Federal facilities and activities and by reforming government procurement practices.

The Federal government is the United States' largest energy consumer with an annual energy bill of \$8 billion. Over 90% of this energy derives from fossil fuels. Improving Federal energy efficiency saves taxpayer dollars, cuts emissions that contribute to global warming, and expands markets for energy-efficient and renewable technologies. Progress towards these goals currently is being made through the initiatives outlined below.

EXPANDED USE OF ENERGY SAVINGS PERFORMANCE CONTRACTS

In July 1998, President Clinton directed all Cabinet agencies to expand the use of Energy Savings Performance Contracts (ESPCs) and other alternative financing, and to step up efforts to reduce Federal energy use to 30% below 1985 levels by 2005. ESPCs leverage private sector investment and expertise to accomplish energy and cost-saving projects in Federal facilities at little or no cost to taxpayers. Under ESPC authority, Federal agencies hire contractors to audit facilities, propose energy saving retrofits, and privately finance, install, and maintain retrofits. Contractors are paid from a share of the savings, with the remaining savings returned to the taxpayers and the agency.

Streamlined ESPC contracts put in place by the Department of Defense (DOD) and the Department of Energy (DOE) already have accelerated large investments in energy projects at many Federal facilities. In July, DOE announced \$1.5 billion in new ESPC contract authority, bringing to \$5 billion the total amount of ESPC authority currently available to Federal agencies. ESPCs can cut over 2 million metric tons of carbon (MMTCE) emissions and save as much as \$700 million a year. The President has directed Federal agencies to develop proposals on ways in which ESPC authority can be expanded, and Congress recently voted to renew existing ESPC authority through 2002.

FEDERAL LIGHTING PURCHASING AND RETROFIT CAMPAIGN

The President's July initiative includes a vigorous effort to upgrade institutional lighting fixtures and to purchase and install an additional 300,000 compact fluorescent bulbs over the

NEXT STEPS

Significant strides already have been made in improving Federal energy efficiency—energy consumption per square foot in Federal buildings is down 15%, and energy use in civilian and military vehicles is down approximately 27% from 1985 levels. However, much more can and will be done. In the coming months, the President is committed to directing further efficiencies in Federal energy management, such as: enhancing the procurement of energy efficient equipment; spurring increased use of alternative fuels and vehicles, expanding renewable technology use by Federal agencies; and expanding knowledge of sustainable building practices by making Federal energy management training materials available by internet and satellite broadcast.

FEDERAL ENERGY EFFICIENCY (continued)

next 3 years. This will prevent up to 600,000 metric tons of carbon emissions (MTCE) over the life of the fixtures and generate electricity cost savings of over \$10 million/year for 3 years through upgrades of old-style institutional lighting fixtures.

FEDERAL ENERGY STAR® BUILDINGS

The ENERGY STAR® Building Label is offered to the top 25% of energy-efficient buildings. In July, the President directed all agencies to take the steps needed to bring existing Federal buildings up to the ENERGY STAR® standards through the use of ESPCs, utility programs, and other agency funded efforts. Increasing energy efficiency will save money in energy bills and reduce the emissions that contribute to global warming.

SUSTAINABLE DESIGN IN NEW FEDERAL BUILDINGS

In July, the President announced that DOD and 6 other Federal agencies will adopt "sustainable design" standards in all new buildings. DOD, for example, has committed to build facilities that use as much as 50% less energy than similar buildings. "Sustainable design" is an integrated approach reflecting increased commitment to energy-efficient and environmentally preferable practices, products, and services. Sustainable design standards can reduce emissions by over 90 MTCE a year and cut energy costs for a typical medium-sized office building by \$70,000 a year.

FACT SHEET ON U.S. GLOBAL CHANGE RESEARCH PROGRAM

N O V E M B E R 1 9 9 8

The U.S. Global Change Research Program (USGCRP) is a \$1.82 billion national, interagency research program. Its goals are to increase understanding of the Earth and human and naturally induced changes in the Earth's environment; to assess the consequences of, and society's vulnerability to, those changes; and to provide a sound scientific basis for decision-making on global change issues.

PROVIDING A SOUND SCIENCE FOUNDATION FOR POLICY DECISIONS

Much is known about the science of climate change. Most fundamentally, it is known that atmospheric concentrations of carbon dioxide and other greenhouse gases are rising as a result of the burning of fossil fuel. Much of the uncertainty of climate change science is focused not on whether increased greenhouse gas concentrations will cause global warming, but rather on exactly how fast and how much temperatures will rise and how climate extremes will be affected. Those are significant questions with far-reaching policy implications. The goal of the continuing U.S. climate change research program is to help reduce those uncertainties and give policymakers a better understanding of both the global and regional impacts of climate change.

CORE RESEARCH AREAS

- ***Seasonal to Interannual Climate Variability:*** Acquire the understanding and skills in order to reliably forecast short-term climate fluctuations such as El Niño.
- ***Climate Change Over Decades to Centuries:*** Understand, predict, and assess changes in climate resulting from natural causes and human activities, and assess the vulnerability of society, ecosystems, and natural resources to long-term changes in climate.
- ***Changes in Ozone, UV Radiation, and Atmospheric Chemistry:*** Monitor, understand, and characterize chemical changes in the global atmosphere and assess their consequences for the well-being of society and ecosystems.
- ***Changes in Land Cover and Terrestrial and Aquatic Ecosystems:*** Understand, predict, and assess the causes and consequences of changes in land cover, and in terrestrial and aquatic ecosystems.

NEW RESEARCH DIRECTIONS

- ***Nation's Vulnerability to Climate Change:*** Apply available analytical and modeling tools to assess U.S. vulnerability to climate change on a region-by-region, cross-region, and cross-sector basis (i.e., water, food).
- ***Sources and Repositories of Atmospheric CO₂:*** More accurately identify and quantify sources and sinks for carbon; understand how movement of carbon from one reservoir to another influences climate change; and assess potential opportunities to store and/or manage carbon for the purposes of coping with climate change.
- ***Ecosystem Health and Function:*** Identify and understand the requirements and processes responsible for ecosystem health and function; assess the consequences of the direct and indirect human impacts on ecosystems.

FACT SHEET ON PARTNERSHIP FOR A NEW GENERATION OF VEHICLES

N O V E M B E R 1 9 9 8

In 1993 President Clinton, Vice President Gore, and the CEOs of the 3 major U.S. domestic automakers announced the **Partnership for a New Generation of Vehicles (PNGV)**. PNGV joins the U.S. Federal government (7 agencies and 20 federal laboratories) and Chrysler, Ford, and General Motors in an effort to develop safe, attractive, affordable automobiles that get up to 3 times the fuel efficiency of comparable vehicles sold today. This would mean that a typical midsize car would be able to achieve 80 miles per gallon.

POTENTIAL BENEFITS OF PNGV

The number of registered vehicles in the United States is expected to climb from 198 million in 1996 to as many as 253 million in 2010, making PNGV's success critical to controlling U.S. and world greenhouse gas emissions. The program also will result in low-cost methods for controlling other urban air pollutants, reduce U.S. dependence on foreign oil, and enhance America's competitiveness in clean, sustainable technologies.

NEXT STEPS

PNGV's ambitious goals are seemingly within reach, given the advances in key technologies that have been achieved during the relatively short life of the program. Since 1993, great strides have been made in the production of lower-cost, light-weight materials for the vehicle body and frame; electrical control systems; batteries; compact, inexpensive fuel cells; and advanced internal combustion engines for use in hybrid vehicles.

An enormous amount of work remains to be done, however, to convert these concepts into practical production vehicles. While the bulk of investments in vehicle development will be made by the industry, Federal cost-sharing and incentive-setting is essential to stimulating the introduction of key new technologies. That is why the President's Climate Change Technology Initiative (CCTI) includes a substantial increase in funding for all PNGV-related work, including funds for developing fuel cells that can substitute for today's internal combustion engine, advanced direct injection diesel cycle engines, and low-NO_x methanol-fueled diesel engines. In response to this initiative, the Fiscal Year 1999 appropriations bills recently signed by President Clinton include a substantial increase in PNGV-related funding.

PROGRESS ON CONCEPT CARS

A direct result of PNGV is the development of "concept cars"—including hybrid vehicles that combine a traditional power source with battery storage and electric motors—that appear capable of approaching PNGV's fuel efficiency and emissions goals without sacrificing safety, performance, or cost. At this year's Detroit Auto Show, all 3 major U.S. auto manufacturers had such concept cars on display. Ford, for instance, demonstrated its P2000 concept car that uses advanced materials to reduce the weight of a full-size vehicle by 40%. Combined with an advanced direct-injection engine, the P2000 is projected to deliver 63 miles per gallon. More recently, at this September's Paris Auto Show, General Motors introduced the first drivable fuel cell vehicle.

PARTNERSHIP FOR A NEW GENERATION OF VEHICLES (continued)

The CCTI also proposes tax credits to stimulate early introduction of new generation automobiles and light trucks. Under the President's plan, in 2000 a credit of up to \$3,000 would be provided for vehicles achieving 2 times the efficiency of today's comparable vehicles, and in 2003 a credit of up to \$4,000 would be provided for cars that achieve 3 times today's efficiency. The Administration also continues to work with industry to explore other tax credit options that would spur increased use of more efficient cars and trucks.

FACT SHEET ON CLIMATE CHALLENGE

N O V E M B E R 1 9 9 8

Climate Challenge is a joint, voluntary effort of the Department of Energy (DOE) and the U.S. electric utility industry to reduce, avoid, or sequester greenhouse gases. Utilities identify and implement cost-effective activities that are specified in agreements between DOE and individual electric utilities. Electric utility trade associations are active in promoting the program and developing industry-wide initiatives. DOE estimates that pledged Climate Challenge partners' actions will reduce emissions equal to 47 million metric tons of carbon (MMTCE) in 2000.

REAL REDUCTIONS

Climate Challenge has been successful in helping shift the thinking of electric utility management and strategic planners, making greenhouse gas emissions mitigation part of their corporate culture and philosophy. Examples of real reductions include:

- **Tennessee Valley Authority** is planning to co-fire wood waste on a continuous, commercial basis at several of its plants. Substituting wood waste for coal causes no net addition of CO₂, since the CO₂ emitted is part of the natural carbon cycle.
- Several utilities, including **Jacksonville (Fla.) Electric Authority**, have committed to landfill gas and generation projects. Others, such as **Allegheny Power**, are seeking to recover methane from coal mining operations.
- In the first market-based CO₂ emissions trade between electric utilities, **Niagara Mohawk Power** exchanged 1.75 million tons of CO₂ reductions for **Arizona Public Service Company's** 25,000 tons of SO₂ allowances (which have an established market value under the 1990 Clean Air Act Amendments). Niagara Mohawk then donated the SO₂ allowances to a non-profit environmental group to be retired, helping mitigate both acid rain and global climate change.

Other actions that utilities have committed to in their agreements include: efficiency improvements in end-use, distribution, transmission, and generation; increased use of electrotechnologies; fuel switching to lower carbon fuels (e.g., natural gas, nuclear, or renewables); transportation actions, including greater use of natural gas-powered and electric vehicles; forestry actions; recovery of methane from landfills and coal seams; and the use of fly-ash as a Portland cement substitute.

INDUSTRY-WIDE INITIATIVES

The utility industry as a whole also has developed 9 industry-wide initiatives under Climate Challenge to research, develop, and promote technologies and practices that lower greenhouse gas emissions. Prominent among these are:

- **EnviroTech**: \$50 million in venture capital funds committed to accelerate commercialization of renewable energy technology and energy-efficient electrotechnologies.
- **Earth Comfort Program**: promoting a ten-fold increase in the purchase of energy-efficient geothermal heat pumps.

CLIMATE CHALLENGE (continued)

- ***International Utility Efficiency Partnerships:*** identifies international energy project development opportunities for U.S. utilities that reduce, limit, or avoid greenhouse gas emissions, and works with host countries to facilitate project investments.

STATUS REPORT

Through April 1998, DOE has signed 124 Climate Challenge Participation Agreements. These agreements represent over 600 utilities and 71% of the U.S. 1990 electric generation and utility carbon emissions. DOE's estimate that currently pledged actions will reduce emissions by 47 MMTCE in 2000 does not include reductions not yet quantified or reductions resulting from the 9 industry-wide initiatives. Some of the Climate Challenge emissions reductions reported by electric utilities also are accounted for elsewhere in the Climate Change Action Plan (CCAP) within estimates for specific technology programs or in baseline assumptions.

FACT SHEET ON CLIMATE WISE

N O V E M B E R 1 9 9 8

Climate Wise is a government-industry voluntary partnership sponsored by the Environmental Protection Agency (EPA) that helps businesses reduce greenhouse gas emissions, increase productivity, and save money. The program gives technical assistance to over 450 individual manufacturing companies (representing 12% of U.S. industrial energy use) that have entered into partnership agreements and submitted comprehensive action plans that identify specific steps they will undertake between the time they enter into the compact and 2000. In 1997, Climate Wise partners prevented emissions equal to more than 8 million metric tons of carbon (MMTCE) and saved \$80 million on their energy bills. By 2000, EPA estimates that Climate Wise partners will reduce emissions by more than 9.5 MMTCE and cut energy costs by more than \$350 million.

HOW IT WORKS

As part of their Climate Wise commitment, partner companies develop comprehensive Action Plans that describe and quantify cost-effective energy efficiency, pollution prevention goals, and specific implementation measures. Companies then must report results annually while striving for continuous improvement. In return, participants receive help in identifying actions that both save energy and reduce costs:

- ***Climate Wise Action Plan Software*** helps companies identify, track, and quantify project benefits.
- ***Peer exchange seminars and workshops*** bring companies together to share managerial and technical expertise.
- ***Technical documents***, such as Wise Rules and Case Study Compendium, help partners estimate energy, cost, and carbon dioxide savings from a wide number of projects and sector-specific savings opportunities.
- ***Public recognition*** for achievements gives companies and individual employees the motivation to continuously improve operations.

WIDE AND GROWING PARTICIPATION

Climate Wise's reach is not limited to large companies—in fact, nearly 50% of Climate Wise partners have fewer than 500 employees. The program also supports 30 State and Local Government Ally partners that are bringing state and local technical assistance resources together with those of the Federal government to help companies identify and implement cost-saving energy efficiency projects.

Building on its U.S. domestic success, EPA recently has teamed with the United States Agency for International Development (USAID) to extend Climate Wise to local municipalities and companies abroad that seek energy savings and emissions reductions. Targeted countries and regions include Brazil, Central America, India, Mexico, and the Philippines.

SUCCESS STORIES

The success of Climate Wise is based on its unique ability to attract a diverse range of companies from various industrial sectors and to encourage the inclusion of greenhouse gas emissions mitigation into their corporate culture and philosophy. Climate Wise success stories include:

- **British Petroleum** has implemented energy efficiency projects at 10 company business units that are reducing annual emissions equal to 54,500 metric tons of carbon (MTCE). In 1996 alone, the company improved the energy efficiency of its worldwide refining operations by 1.2%, saving more than \$8 million. [Apart from its participation in Climate Wise, British Petroleum announced in September that it planned to reduce its worldwide greenhouse gas emissions by 10% below 1990 levels by 2010.]
- **Boeing Company** is upgrading air compressor systems and motors and adopting state-of-the-art energy management control systems covering over 46 million square feet of custodial space. The company also is pioneering the use of digital design technology and lower impact materials. By 2000, Boeing will reduce emissions by 300,000 MTCE.
- **General Motors** has implemented a wide array of actions including annual energy project competitions, more than 800 conservation projects, over 370 energy partnership projects, and implementation of fuel-switching for 5 steam generating powerhouses. These actions have resulted in emissions reductions of 545,000 MTCE.

FACT SHEET ON INDUSTRIES OF THE FUTURE

N O V E M B E R 1 9 9 8

Through **Industries of the Future**, the Department of Energy (DOE) has formed research partnerships with the United States' most energy-intensive industries, focusing on ways to increase energy and resource efficiency. Industries included in the program use more than 80% of all energy consumed in U.S. manufacturing. As research projects come to fruition, participating industries stand to significantly reduce both their energy costs and their greenhouse gas emissions.

HOW IT WORKS

Industries of the Future seeks to make the most of scarce research resources by helping to ensure that government-funded research is more sharply focused on helping U.S. industry develop energy-efficient technologies. Industry participants create a document outlining the industry's vision for the future, providing a framework for shaping major advancements in technology. DOE then draws from the menu of possibilities to shape a portfolio of near-, medium-, and long-term research, development, and deployment activities.

TOWARDS A GREENER, MORE COMPETITIVE FUTURE

Without significant improvements in reducing waste in the participating industries, expenditures on pollution abatement and control are expected to exceed \$200 billion by 2000. By incorporating pollution prevention and energy efficiency into their corporate culture and philosophy, industry can reduce or eliminate the need for expensive downstream pollution control equipment and transform these expenditures into productive investments for new manufacturing equipment and jobs. The international competitiveness of these industries also will be enhanced significantly as the developing world increasingly demands cleaner technologies to set them on a sustainable development course.

WIDE PARTICIPATION, AMBITIOUS GOALS

Industries participating in the program account for about 5% of the U.S. gross domestic product, employ 2.9 million workers, and account for more than 80% of all energy used and 90% of all waste produced by the U.S. manufacturing sector. They include:

- Agriculture
- Aluminum
- Glass
- Chemicals
- Forest Products
- Metal Casting
- Mining
- Petroleum Refining
- Steel

Industries of the Future-based research has put many of these industries on the verge of genuine technological and commercial breakthroughs that will improve their energy efficiency dramatically and lower their greenhouse gas emissions. The forest products industry, for example, is working with DOE on the development of advanced biomass and black liquor gasification technology for use in cogeneration systems that actually could make the forest products industry a net *sink* of carbon. The aluminum industry believes that it is possible to reduce dramatically the energy intensity

INDUSTRIES OF THE FUTURE (continued)

of the aluminum reduction cell through the use of a non-consumable anode combined with wettable cathode technology. Adoption of these technologies could increase the industry's energy efficiency up to 25%, reduce operating costs up to 10%, and eliminate PFC emissions and process-related CO₂ emissions from smelters.

For the program as a whole, DOE has articulated a "stretch goal" of a 25% reduction in energy intensity (energy/unit output) in these industries by 2010. DOE's preliminary estimates are that partners will prevent emissions equal to 25 million metric tons of carbon (MMTCE) by 2010 and realize a \$4 billion savings in energy costs. These numbers may increase significantly as research programs related to the mining, agriculture, and petroleum industries (all of which only recently joined the program) are analyzed.

FACT SHEET ON MILLION SOLAR ROOFS INITIATIVE

N O V E M B E R 1 9 9 8

In June 1997 President Clinton launched the **Million Solar Roofs Initiative** with the goal of placing solar energy systems on 1 million roofs in the United States by 2010. This goal will be achieved through existing Federal financing, procurement, and other programs, and by working in partnership with local communities, businesses, utilities, and Federal agencies to accelerate the use of solar energy systems. Meeting the President's goals will reduce carbon emissions equivalent to the annual emissions from 850,000 cars by 2010 and will produce the same electrical generating capacity as several large coal-fired plants. It also will create an estimated 70,000 high-tech jobs and increase domestic production of solar technologies, helping reduce production prices and enhancing the competitiveness of the U.S. solar energy industry.

STATUS REPORT

By June, 1998—just one year after President Clinton announced the initiative—the Department of Energy (DOE) already had received commitments from utilities and states for over half a million solar rooftop installations. Entities involved include: Hawaii Electric Company, the Los Angeles Department of Water and Power, New England Service, Sacramento Municipal Utility District, the State of Colorado, Maryland Energy Administration, Tucson Electric Power Company, Washington State, Salt River Project, and the Federal government.

AFFORDABLE FINANCING

This past June, a new private sector partnership was announced to provide long-term, low-cost financing for solar energy systems. Spurred by the President's initiative, the General Motors Acceptance Corporation and the Solar Energy Industries Association announced a partnership to provide long-term, low-cost financing for solar energy systems. Under this plan, financing will be available at the same rate as standard home mortgages, rather than at the much higher rates that are typically charged. This breakthrough removes a significant barrier to the installation of solar energy systems in new and existing homes.

TAX INCENTIVES AND R&D FUNDING

The President's Climate Change Technology Initiative (CCTI) includes tax incentives and R&D investments to encourage installation of solar energy systems in buildings, including:

- **Increased investment in solar and renewable energy R&D.** DOE would fund cost-reduction R&D for solar rooftop systems and establish partnerships with communities, builders, and other Federal agencies to accelerate their use.
- A **tax credit equal to 15%** of the cost of rooftop photovoltaic (PV) systems and solar water heating systems to make them more affordable and encourage their purchase. The maximum credit would be \$2,000 for PV systems and \$1,000 for solar water heating systems.

In response to the CCTI, the Fiscal Year 1999 appropriations bills recently signed into law by President Clinton include a substantial increase in funding to further solar and other renewable energy research and development.

FACT SHEET ON MOTOR CHALLENGE AND ENERGY EFFICIENCY IN MANUFACTURING

N O V E M B E R 1 9 9 8

The Department of Energy (DOE) currently has several voluntary initiatives aimed at improving energy efficiency in manufacturing plants: **Motor Challenge**, **Steam Challenge**, **Combined Heat and Power Challenge**, and **Compressed Air Challenge**. These 4 programs offer various types of technical assistance, tools, and information to industry. By 2015, the 4 initiatives are expected to reduce emissions equal to 20 million metric tons of carbon (MMTCE) and to generate \$3 billion in annual cost savings.

The most mature partnership, Motor Challenge, began in 1995 and works with U.S. industry to increase the energy efficiency of electric motor systems by eliminating unfavorable market barriers so that system efficiencies are achieved and sustained by market forces alone. Through Motor Challenge, U.S. industry already has saved 6 to 9 billion kilowatt-hours a year through the installation of energy-efficient electric motors and adjustable speed drives, reducing emissions by 2 MMTCE—equivalent to the emissions from 400,000 automobiles—and saving \$300-\$450 million in energy costs.

OVERCOMING MARKET BARRIERS TO ENERGY EFFICIENCY

Energy-efficient technologies and practices have the potential to reduce greatly the amount of energy used in U.S. manufacturing, but often they face significant market barriers to widespread use. Sixty-six percent of industrial electricity, for example, goes to some type of motor-driven system and accounts for nearly 10% of all U.S. emissions of carbon dioxide. A recent Motor Challenge study projected that 10-16% of motor system electricity use could be saved if all cost-effective applications of proven efficiency technologies and practices were undertaken. However, significant barriers prevent these changes from occurring.

One such barrier is the low priority of energy efficiency among capital investment and operating objectives within U.S. manufacturing. This is because manufacturing motor system energy costs constitute less than 1% of total operating costs. Another barrier is the general lack of awareness among facility managers, equipment distributors, and engineers of options to increase motor system efficiency. Manufacturing plants also lack the staff resources to target the opportunities. Lastly, there are conflicting incentives for suppliers regarding the promotion of efficiency equipment and practices.

SUCCESS STORY

DuPont is working with the Motor Challenge and Steam Challenge programs to identify new management methods and additional efficiency opportunities at DuPont's Chambers Works plant in Deepwater, New Jersey. Since 1993, DuPont's efforts to conserve energy and improve efficiency at the Chambers Works plant have increased productivity by 5%, reduced energy cost per pound of product by 25%, and improved overall energy utilization by 29%. Cumulative energy cost savings from 1994 to 1997 amounted to more than \$45 million, with a corresponding reduction in greenhouse gas emissions.

MOTOR CHALLENGE AND ENERGY EFFICIENCY IN MANUFACTURING (continued)

Motor Challenge, Steam Challenge, Combined Heat and Power Challenge, and Compressed Air Challenge seek to reduce barriers such as these by providing tools, information, and training.

WIDE AND GROWING PARTICIPATION

As of 1998, Motor Challenge has reached over 30,000 industry people to provide them with tools, information, and training (about 5% of the potential customer base). Currently, there are over 200 Motor Challenge Allied Partner companies that work with DOE to disseminate the information and tools of Motor Challenge; the Allied Partners have trained over 10,000 people in the past year. Organizations such as the Technical Association of the Pulp and Paper Industry (TAPPI), which has 33,000 members, and the Hydraulic Institute, which represents the U.S. pump industry, are examples of industry groups that have joined with DOE to develop new products and disseminate valuable information resources as broadly as possible to industry.

FACT SHEET ON ENERGY EFFICIENCY STANDARDS FOR EQUIPMENT AND APPLIANCES

N O V E M B E R 1 9 9 8

To save energy and reduce consumer utility bills, the Department of Energy (DOE) develops test procedures and national minimum **energy efficiency standards for equipment and appliances**, such as heating and cooling equipment, water heaters, lighting, refrigerators, clothes washers and dryers, and cooking equipment. By law, these standards must result in the maximum improvement in energy efficiency that is technologically feasible and economically justified. Through 1997, residential appliance standards avoided emissions equal to 30 million metric tons of carbon (MMTCE) and have saved consumers a total \$10.5 billion. These standards will continue to save money and avoid carbon emissions every time a new appliance is purchased. By 2010, the currently enacted standards will have avoided emissions of 150 MMTCE and saved consumers \$33 billion.

HOW IT WORKS

Residential and commercial buildings account for 37% of total U.S. energy use and 35% of total U.S. carbon emissions. About 75% of this use is determined by 6 kinds of equipment and appliances: heating and cooling equipment, water heaters, lighting, refrigerators, clothes washers and dryers, and cooking equipment. Improving the energy efficiency of these products offers tremendous opportunities for reducing U.S. greenhouse gas emissions. DOE enlists the participation of manufacturers, utilities, environmental groups, state officials, and consumers to enact standards that reflect a consensus position that maximizes energy savings while balancing the economic, energy, and environmental objectives. Currently, DOE is in the process of developing standards for 4 additional priority products: clothes washers, fluorescent lamp ballasts, water heaters, and central air conditioners.

OTHER BENEFITS

In addition to reducing U.S. greenhouse gas emissions and saving money for consumers, equipment and appliance standards also benefit the marketplace in other ways. Reduced energy consumption of peak-load equipment like air-conditioners has allowed utilities to better balance electricity capacity. Product planning by manufacturers can take place with known future levels of performance standards. Finally, the consumer benefits not only from reduced operating costs, but also often from higher quality products since standards tend to remove the worst performing products from the market.

FACT SHEET ON ENERGY STAR® PRODUCTS

N O V E M B E R 1 9 9 8

The ENERGY STAR® Products program is a voluntary, public-private partnership that helps bring high-efficiency consumer and office products into U.S. homes and offices. Administered by the Department of Energy (DOE) and the Environmental Protection Agency (EPA), the program allows manufacturers of selected energy-efficient products to promote their products with an "ENERGY STAR®" label, giving consumers and businesses the ability to easily identify products that save energy and money and help the environment. In 1997 alone, products bearing the ENERGY STAR® label prevented emissions equal to some 2 million metric tons of carbon (MMTCE)—the equivalent of more than 1.5 million automobiles—and saved consumers more than \$740 million. In 2010, the full program is expected to prevent emissions of 23 MMTCE and generate cost savings of \$10 billion.

OVERCOMING MARKET BARRIERS TO ENERGY EFFICIENCY

Electricity generation accounts for 35% of all U.S. emissions of carbon dioxide and 38% of nitrogen oxides. Studies by DOE indicate that the United States could reduce its greenhouse gas emissions by 20% by 2010 simply by investing in existing, proven, and cost-effective energy-efficiency technology.

But both consumers and businesses often lack objective information on energy-efficient products or are dissuaded from buying them due to competing and confusing energy efficiency claims or their higher purchase price (despite the long-term savings they afford). ENERGY STAR® Products seeks to overcome these market barriers and provide consumers and businesses with the standardized, reliable information they need to invest in long-term energy cost savings. The program also works with lenders to provide financing packages that overcome the high initial purchase price of energy-efficient products.

WIDE AND GROWING PARTICIPATION

As of January 1998, over 500 manufacturers were participating in the ENERGY STAR® Products program, offering more than 25 kinds of ENERGY STAR® products, ranging from computers to refrigerators to central air conditioning units. The number of ENERGY STAR®-qualified models across these products has grown to 3,400. Recent additions to the partnership include TV and VCR manufacturers and window manufacturers. Products now bearing the ENERGY STAR® label include:

- **Appliances:** Dishwashers, refrigerators, room air-conditioning units, clothes washers
- **Office Equipment:** Computers, monitors, copiers, fax machines, printers, scanners
- **Residential Heating and Cooling Equipment:** Boilers, central air-conditioning, furnaces, heat pumps, thermostats
- **Home Electronics:** Televisions, VCRs, TV/VCR combination units
- **Windows:** Residential windows, doors, skylights
- **Other Products:** Exit signs, insulation, home lamps and lighting fixtures, transformers

The program also is continuing its consumer awareness efforts through televised public service announcements, print media advertisements, and mass-transit bulletins. In addition, 20 utilities across the United States are now using the ENERGY STAR® label to promote energy-efficient products in their own service areas.

FACT SHEET ON ENERGY STAR® BUILDINGS AND GREEN LIGHTS

N O V E M B E R 1 9 9 8

ENERGY STAR® Buildings and Green Lights are cutting-edge, voluntary partnerships with the private sector to improve energy efficiency in commercial and industrial buildings. These programs promote energy efficiency as a business strategy that owners and managers of commercial and industrial buildings can adopt to improve the environment and their bottom line. In 1997, participants in the programs prevented emissions equal to 1.4 million metric tons of carbon (MMTCE)—equivalent to the emissions from more than 1 million automobiles. In 2010, the full ENERGY STAR® Buildings and Green Lights programs are expected to prevent emissions of 23.9 MMTCE and generate energy cost savings of \$11.3 billion.

OVERCOMING MARKET BARRIERS TO ENERGY EFFICIENCY

Electricity generation accounts for 35% of all U.S. emissions of carbon dioxide and 38% of nitrogen oxides. Commercial and industrial buildings, in turn, account for over 15% of all U.S. energy consumption. Yet businesses often lack objective information on the benefits of energy-efficient strategies or are dissuaded by high up-front costs (despite the long-term savings they

SUCCESS STORIES

Notable ENERGY STAR® Buildings and Green Lights success stories include:

- The **Mobil Corporation** has realized tremendous success as a partner in both the Green Lights and ENERGY STAR® Buildings programs. By completing a comprehensive lighting upgrade, they already have saved over \$1 million a year and are preventing emissions equal to more than 13,500 metric tons of carbon (MTCE). Mobil Corporation's management has embraced the principles of Green Lights and ENERGY STAR® Buildings and implemented their own "Energy Management Plan" which reaches not only across the U.S., but to all of their facilities around the globe. With this new plan, Mobil is committed to reaching a goal of \$125 million energy cost savings in 5 years.
- The **State of Wisconsin** has joined the Green Lights & ENERGY STAR® Buildings Partnership and invested in energy-efficient lighting technologies in its state buildings. Wisconsin already is preventing the release of over 30,000 MTCE annually while saving more than \$7 million annually in taxpayers' money.
- The **Davenport Community School District**. With the help of technical information from EPA, the Davenport, Iowa, school system was able not only to improve the lighting in its buildings, but also to prevent the annual release of 729 MTCE and 25,000 pounds of smog-forming nitrogen oxides and save more than \$240,000 in annual energy costs. According to Dr. Brad Allison, superintendent of the school district: "Green Lights is a government program that really works. Now [the money we are saving in energy costs] can be used instead for textbooks and other needs."

afford). ENERGY STAR® Buildings and Green Lights seek to overcome these market barriers and provide consumers and businesses with the information they need to invest in long-term energy cost savings. Once thought of as an uncontrollable overhead expense, energy has, in fact, become an area for high-return investment—estimated at 20-30% for whole-building upgrades.

HOW IT WORKS

Under Green Lights, EPA provides technical information and support and public recognition to participants who agree to install energy-efficient lighting. The ENERGY STAR® Buildings program expands upon Green Lights by encouraging individual building owners, developers, and others to undertake more comprehensive building upgrades. This program leads a building owner through a five-stage strategy to capitalize on system interactions that maximize energy savings at minimum cost. Commercial and Federal buildings that are in the top 25% in energy efficiency qualify for the “ENERGY STAR® Buildings” label.

WIDE AND GROWING PARTICIPATION

To date, ENERGY STAR® Buildings and Green Lights have established partnerships with over 2,600 organizations that are now helping eliminate 7 billion kilowatt-hours of annual energy waste and saving themselves over \$500 million on their annual energy bills. Among the buildings that have already signed up for the ENERGY STAR® Buildings Program are the Empire State Building, the World Trade Center, and Chicago’s Sears Tower.

FACT SHEET ON THE VOLUNTARY ALUMINUM INDUSTRIAL PARTNERSHIP

N O V E M B E R 1 9 9 8

The Voluntary Aluminum Industrial Partnership (VAIP) is a joint effort of the Environmental Protection Agency (EPA) and the domestic aluminum industry to reduce perfluorocarbon (PFC) emissions while increasing the efficiency of primary aluminum production. PFCs are extremely potent greenhouse gases that occur during interruptions in the aluminum production process. Reducing PFCs emissions not only helps counteract global climate change, but also puts to productive use energy that would otherwise be wasted. Since the VAIP was launched in April 1995, membership has grown to include 11 of the nation's 12 primary aluminum producers, representing 22 smelters and 94% of U.S. production capacity. In 1996, partners reduced their emissions by an amount equal to 1.45 million metric tons of carbon (MMTCE). VAIP partners cumulatively have committed to reducing PFC emissions by 45% from 1990 levels by 2000—equal to 2.2 MMTCE.

OVERCOMING MARKET BARRIERS TO ENERGY EFFICIENCY

The primary aluminum industry is energy intensive, consuming 430 trillion British thermal units (Btus) of electricity in 1995, roughly 1.2% of the nation's total industrial energy use. Energy accounts for about one-third of the cost of primary aluminum production. As a result, primary aluminum smelters have a clear economic incentive to reduce energy use. One of the ways producers can reduce energy use is by minimizing so-called "anode effects," which in turn reduces emissions of PFCs. By supporting research on anode effects and disseminating information, VAIP is helping its partners take steps to reduce anode effects and use energy more efficiently.

HOW IT WORKS

The VAIP is implemented through a Memorandum of Understanding (MOU), which describes the commitments and responsibilities of each party. For its part, EPA agrees to support the development of technical information that will improve the understanding of how PFC emissions relate to anode effects and what steps might be taken to reduce emissions. Partners, in turn, agree to pursue technically feasible and cost-effective efforts to reduce PFC emissions, and to provide EPA with annual reports indicating their success. The VAIP is flexible, allowing its partners to tailor the program to reflect their own particular mix of technology, management structure, and operational practices. VAIP partner actions to reduce anode effects and emissions include improved employee training, changes in the alumina feed techniques, and the use of computer monitoring to optimize pot performance.

FACT SHEET ON WASTEWIS\$E

N O V E M B E R 1 9 9 8

Since January 1994, the Environmental Protection Agency's (EPA) WasteWi\$e program has worked with American businesses; Federal, state, local, and tribal governmental agencies; and other institutions to reduce municipal solid waste. Presently, more than 800 organizations are WasteWi\$e partners. Through the WasteWi\$e program, partners voluntarily set goals in 3 areas: waste prevention, recycling, and buying/manufacturing recycled products. Partners track their progress during a 3-year period and report annually on their accomplishments.

Waste reduction activities reduce greenhouse gas emissions in several ways, including energy savings, increased carbon sequestration, and avoided methane emissions. In 1997 alone, the combined waste reduction results of WasteWi\$e partners prevented emissions equal to 5 million metric tons of carbon (MMTCE)—equivalent to the average annual emissions from electric power consumption of roughly 3 million households.

HOW IT WORKS

The WasteWi\$e program helps participating organizations discover waste reduction opportunities and set waste reduction goals. Partners contact the program to receive personalized technical assistance and have access to an extensive library containing information on municipal solid waste reduction practices nationwide. In addition, the program maintains a website and a list server to support its partners. EPA also publicly recognizes individual organizations and program successes through its publications, satellite forums, trade show exhibits, regional and national events, and an awards program.

WIDE AND GROWING PARTICIPATION

WasteWi\$e partners are located all across the United States and represent over 50 business, civic, and industrial sectors, ranging from Fortune 1000 companies to small local governments. In

SUCCESS STORIES

WasteWi\$e recognizes Partners of the Year and Program Champions at a national awards ceremony held every year. In September of this year, 8 Partners of the Year and 20 Program Champions were recognized. Examples of these domestic waste reduction achievements include:

- **Partner of the Year Bank America** recycled 14,500 tons of office paper and used 386 tons less paper by switching to 15 pound rather than 20 pound paper.
- **Partner of the Year Bell Atlantic** recycled 21,600 tons of metal and purchased 61,000 tons of recycled mixed paper for telephone directories.
- **Program Champion Herman Miller, Inc.** reduced its volume of transport packaging for finished goods by 50 percent, eliminating 250 tons of wood pallets and 491 tons of corrugated cardboard.
- **Program Champion Seattle University** collected 438 tons of material through its campus-wide recycling program.

These are just several of the thousands of waste reducing activities undertaken by WasteWi\$e partners. Although the program promotes these types of waste reduction activities to reduce costs and pollution in the United States, these activities are readily transferable internationally to companies and governments interested in waste reduction.

WASTEWI\$E (continued)

recent years, WasteWi\$e membership has grown from 361 partners in 1994 to its current membership of 823 partners. Most recently, WasteWi\$e has expanded to include government partners. Reported waste reduction achievements of WasteWi\$e partners totaled 7.7 million tons of solid waste in 1997. Avoided disposal cost savings has grown from \$35 million in 1994 to \$217 million in 1997.

FACT SHEET ON METHANE REDUCTION PROGRAMS

N O V E M B E R 1 9 9 8

The United States government administers a variety of industry-government voluntary partnerships that are reducing significantly U.S. methane emissions from a variety of sources. Three of the programs (the **Landfill Methane Outreach Program**, the **Coalbed Methane Outreach Program**, and **Natural GasSTAR**) are administered by the Environmental Protection Agency (EPA); the two agriculture-based programs (AgSTAR and the **Ruminant Livestock Efficiency Program**) are joint efforts of the EPA and the U.S. Department of Agriculture (USDA). In each case, the programs encourage the profitable collection and use of methane, as opposed to its release to the atmosphere. In 1997, participants in the programs reduced methane emissions by an amount equal to 3.7 million metric tons of carbon (MMTCE)—equivalent to the emissions from more than 3 million automobiles. By 2010, these programs are expected to avoid methane emissions of 22 MMTCE.

OVERCOMING BARRIERS

The reasons for methane emissions are diverse, and vary among the different industries in which they occur. In all instances, however, methane emissions represent lost energy product. In natural gas systems, for example, methane emitted to the atmosphere through valves or leaky pipelines represents gas that cannot be sold to customers.

In general, there are 3 main types of barriers to reducing methane emissions. First, typically methane is a byproduct emission and is not viewed as a resource in its own right. Companies may lack objective technical and economic information on methane recovery options. Second, reducing methane emissions frequently involves investing in methane recovery technologies, which may be unfamiliar to companies or require partnerships with outside entities. Third, many companies confront institutional or regulatory barriers as they try to develop projects. The United States Government's methane reduction programs seek to overcome these barriers by promoting the use of available methane technologies, taking account of the unique needs and challenges of each industry.

- The **Landfill Methane Outreach Program** provides technical information and support to the many players in landfill projects, including state agencies, energy companies, communities, and industry. The landfill program has assisted more than 80 planned and operational projects, through such activities as providing decision support software, identifying potential partners, and addressing specific technical or regulatory issues.
- The **Coalbed Methane Outreach Program** works with coal mines and project developers to identify attractive opportunities and identify the necessary participants to develop projects. EPA profiles promising projects, develops technical and cost evaluation models, and undertakes a variety of studies for coal mines on specific project implementation issues. As a result of the program, methane recovery by the coal industry has more than doubled since 1993.
- Through **Natural GasSTAR**, EPA works with more than 70 gas production, transmission, and distribution companies, which commit to evaluate the applicability of several "best management practices" in their systems. EPA provides partners with detailed technical and economic

METHANE REDUCTION PROGRAMS (continued)

information on how to reduce emissions, as well as recognition for their efforts. The program has identified more than 50 previously unrecognized ways of economically reducing methane emissions, which are now being widely adopted by industry.

- **AgSTAR** is a joint EPA/USDA program that assists livestock producers with recovering methane from their animal waste management systems. Through provision of technical information and design and engineering assistance, AgSTAR helps producers optimize their waste management systems and recoup some of their investments through energy recovery. Over 500 farms are currently AgSTAR partners and are evaluating the potential to install methane recovery systems
- The **Ruminant Livestock Efficiency Program** is a joint effort of USDA and EPA that aims to increase livestock production efficiency by improving the conversion of animal feed into useful products like beef or milk, resulting in increased profitability for producers and less methane per unit of product. The program has identified a number of simple livestock management techniques that can improve productivity and is now focused on educating livestock producers in these techniques through USDA's field extension services.

SUCCESS STORIES

- **Lucent Technologies**, a leader in telecommunications, is benefiting as an end-user from one of the Landfill Methane Outreach Program's Gas-to-Energy projects. Lucent, in collaboration with Network Energy of Lake County, Inc., is fueling boiler operations with landfill gas instead of fossil fuels, saving Lucent \$100,000 a year on fuel bills. The project is reducing greenhouse gas emissions equal to more than 28,000 metric tons of carbon (MTCE)—equivalent to taking more than 23,000 cars off the road each year.
- Since 1990 **Chevron USA Production Company**, an integrated energy company that produces, transports, and refines petroleum products, has actively implemented several cost-effective methane reduction technologies and practices with the help of the Natural GasSTAR Program. By taking actions such as the replacement or retrofit of high-bleed pneumatic devices, the installation of flash tank separators on glycol dehydrators, and the use of vapor recover units on oil tank batteries, the company has prevented methane emissions of 780,000 MTCE.

WIDE AND GROWING PARTICIPATION

All of the methane recovery programs have secured wide participation from key industry groups. To date, there are more than 80 landfills, almost 20 coal mines, 70 natural gas companies, and over 500 livestock producers participating in the programs. In addition, key companies, states, and trade associations are working together with the U.S. government to promote methane recovery. As a result, the U.S. should be able to maintain relatively flat methane emissions through 2000 and is projecting declining methane emissions in the future.

FACT SHEET ON ENERGY SMART SCHOOLS

N O V E M B E R 1 9 9 8

Energy Smart Schools is a national partnership that brings together public and private sector resources to cut energy bills in schools and reinvest the savings in students and their education. Announced by U.S. Energy Secretary William Richardson on October 5, 1998, the Energy Smart Schools partnership will work with primary and secondary school systems to reduce energy use, energy costs, and greenhouse gas emissions. The partnership will increase the use of clean energy technologies in existing and new schools; develop incentives that allow additional school districts to reinvest energy savings into critical education needs; improve the learning environment of classrooms and other school facilities through daylighting, better temperature control, and air quality; and increase student, teacher, and community awareness of energy and related issues. It is estimated that a 25% reduction in schools' energy use will cut annual U.S. greenhouse gas emissions by an amount equal to 3-4 million metric tons of carbon (MMTCE).

BENEFITS OF ENERGY SMART SCHOOLS

Our nation's schools spend over \$6 billion a year on energy. At the same time, it is believed that schools could save up to \$1.5 billion annually through smarter energy use in both new and existing schools. These smarter energy practices will not only reduce greenhouse gas emissions, but also result in better lighting conditions, better indoor and outdoor air quality, better controlled classroom temperature, and reductions in vehicle emissions—all of which can improve the productivity and general well-being of students and teachers. What is more, the savings could pay for 40 million new text books, 30,000 new teachers, or 1.5 million new computers every year.

10-POINT ACTION PLAN

Through the Energy Smart Schools partnership, the U.S. Department of Energy (DOE) will work with diverse groups and individuals involved with schools, including administrators, teachers, facility managers, custodians, school bus drivers, teachers, students, parents, architects, and labor unions. Under a 10-point action plan, the Energy Smart Schools partnership will establish aggressive goals; disseminate information on energy efficiency and renewable energy; provide training and technical assistance; remove barriers to innovative financing; develop energy curricula; support studies that quantify the impact of energy technologies on learning and health; develop energy specifications for school design and construction; demonstrate advanced technologies; recognize success; and hold quarterly meetings to track progress, share lessons learned, and plan future activities.

GROWING NUMBER OF PARTNERS

Though officially launched just last month, the Energy Smart Schools partnership already is building a solid foundation of participation. Major companies, along with federal, state, and local organizations, already have pledged significant support to the Energy Smart Schools partnership after a July meeting with over 80 representatives of utilities; leading businesses; manufacturers; the renewable energy industry; federal, state, and local governments; unions; and school organizations.

FACT SHEET ON BIOENERGY

N O V E M B E R 1 9 9 8

The U.S. government administers a variety of programs, in partnership with industry, on the research, development, and deployment of **bioenergy** resources and technologies, including electricity production, fuels for transportation, and industrial processing and manufacturing. Administered by the U.S. Department of Energy (DOE) and the U.S. Department of Agriculture (USDA), these programs provide both federal tax incentives and funding for R&D and demonstration projects to encourage the use of biofuels. Currently, bioenergy is one of the leading renewable energy technologies in the United States—accounting for 3-4% of primary energy consumption and one of the few technologies that can recycle and sequester carbon. Bioenergy refers to the application of advanced technologies for the conversion of trees, grasses, crops, and wastes, including agricultural wastes, to electricity, fuels, and chemicals.

POTENTIAL BENEFITS OF BIOENERGY TECHNOLOGIES

Bioenergy technologies provide substantial environmental benefits. Since bioenergy crops absorb carbon during growth, their use for energy applications can result in a near zero net carbon release. When these fuels are used to displace traditional fossil fuels, significant emissions reductions of greenhouse gases can be achieved. DOE estimates, for example, that by 2010, the addition of 8,000 megawatts of new biomass power capacity will result in reduced emissions equal to 11.16 million metric tons of carbon (MMTCE). Four billion gallons of increased ethanol production is expected to result in emissions reduction of 3.9 MMTCE. In addition, since biomass is domestically produced and is renewable, it offers significant opportunities for job creation, rural economic development, and alternative crop production opportunities for farmers.

BIOENERGY TAX INCENTIVES

Federal tax incentives to expand bioenergy use include:

- **Unconventional Fuels Credit** (gas produced from biomass and certain other fuels can qualify for a credit of 51.7 cents/million Btus [plus indexation for post-1979 inflation]);
- **Production Tax Credit** (1.5 cents/kilowatt hours [plus indexation for post-1992 inflation] for electricity generated from wind and "closed loop biomass");
- **Alcohol Fuel Credit** (60 cents/gallon for converting biomass into ethanol or methanol);
- **Alcohol Mixture Credit** (54 cents/gallon of ethanol and 60 cents/gallon of methanol when mixed with gasoline and diesel fuel and claimed by the company that does the mixing as a credit against otherwise applicable excise taxes on motor fuel);
- **Tax Credit for "Small" Ethanol Producers** (10 cents/gallon tax credit on first 15 million gallons of output a year for producers who have a production capacity of less than 30 million gallons/year);
- **Tax-Exempt Financing** (for certain facilities that burn municipal waste and also generate electricity).

DEMONSTRATION PROJECT SUCCESSES

In order to accelerate the use of bioenergy technologies and realize environmental benefits, demonstration projects are a high priority. Working with industry, several demonstrations of first-of-a-kind technology are underway. These successes include a biomass gasification system, which initiated operations in 1997; a chemical process producing plastics from plants, which was proven technically feasible in 1998; and an ethanol-from-waste facility projected to go into operation in 1999. The recent formation of the Agriculture Industries of the Future program is a positive step toward using plant and crop resources for making a host of everyday consumer products like plastics, paints, and adhesives.

NEXT STEPS

More than ever, concerns about weakening economic conditions for the nation's farmers, global climate change, clean air, clean water, rising oil imports, and the restructuring of the utility industry offer the bioenergy industries an opportunity to increase production of clean and affordable feedstocks, fuels, and technologies. DOE and USDA are working to strengthen the existing research, development, and deployment programs in bioenergy technologies to accelerate the development of these technologies and overcome barriers to deployment. In support of these efforts, the President's Climate Change Technology Initiative includes significant increases in funding for bioenergy, as do the Fiscal Year 1999 appropriations bills he recently signed into law.

FACT SHEET ON CARBON SEQUESTRATION AND U.S. AGRICULTURE AND FORESTRY PROGRAMS

N O V E M B E R 1 9 9 8

Carbon sequestration and carbon "sinks" will play a critical role in helping the world meet the challenge of climate change. Recently, there has been an intensified focus on and greater understanding of how agriculture and forestry practices can greatly affect the ability of farmland and forests to sequester carbon and help mitigate climate change effects. As a result, the U.S. Department of Agriculture (USDA) has begun to analyze the net carbon effects of its various conservation and environmental programs and to determine how they can be enhanced and expanded to foster greater sequestration. In general, these programs assist farmers, ranchers, and other landowners in conserving and improving soil, water, and other natural resources associated with rural land. Some of these programs and their estimated ancillary carbon sequestration benefits (where available) are described more fully below.

- **Conservation Technical Assistance (CTA)** helps farmers to develop and implement conservation plans on farms and ranches. Conservation compliance requires such plans on highly erodible lands to maintain eligibility for other USDA programs. USDA estimates that an amount equal to 22 million metric tons of carbon (MMTCE) was sequestered in 1997 as a result of conservation tillage alone. Other practices that result in significant carbon sequestration and have been applied due to this program include cover crops, residue management, crop rotation, and buffer establishment.
- **Conservation of Private Grazing Land Initiative (CPGLI)** provides technical grazing management assistance for owners and managers of non-Federal grazing lands that result in improved animal performance, decreased methane gas emissions, and increased carbon sequestration. In 1997, conservation systems were implemented on 6.4 million acres through this initiative (up 25% over 1996).
- **Conservation Reserve Program (CRP)** provides rental payments and cost-sharing on 36.4 million acres for grass, shrub, or tree plantings in exchange for retiring highly erodible or other environmentally sensitive cropland for 10-15 years. The annual carbon sequestration for this program is approximately 11.3 MMTCE/year. Additional benefits from elimination of nitrogen application have been estimated at 1.8 MMTCE/year.
- **Environmental Quality Incentives Program (EQIP)** provides cost-sharing to encourage farmers and ranchers to adopt conservation practices. For example, in 1997 grazing land cover was improved on 3.2 million acres (increasing soil carbon storage), and nutrient and manure management systems were implemented on 1.9 million acres (lowering emissions).
- **Swampbuster** program links wetlands protection to program benefit eligibility and has preserved over 5.8 million acres of wetlands that would otherwise have been converted to agricultural use. This has resulted in sequestration of an estimated 1.6-1.3 MMTCE/year (not including above-ground carbon sequestered in wetland trees or shrubs).
- **Wetlands Reserve Program (WRP)** offers private landowners financial incentives to enhance wetlands in exchange for retiring marginal agricultural land. Some 666,760 acres are now enrolled in the program, sequestering an estimated 66,676 metric tons of soil organic carbon (MTCE)/year (not including above-ground carbon).

**CARBON SEQUESTRATION AND U.S.AGRICULTURE
AND FORESTRY PROGRAMS (continued)**

- ***Forestry Incentives Program (FIP)*** provides financial and technical assistance to encourage production of sawtimber and pulpwood on non-industrial private forestlands. From 1991 to 1997, a total of 1,054,500 acres were enrolled in the program. In 1997 .2 MMTCE was sequestered in biomass above and below ground due to this program.
- ***Stewardship Incentive Program (SIP)*** provides financial and technical assistance to expand tree planting and implement stewardship plans on private forest properties. In 1997 .1 MMTCE was sequestered in biomass above and below ground due to this program.
- ***National Forest conservation*** practices in the 1990s on the 85 million acres of U.S. timberland have reduced timber harvest from 12 billion board-feet/year in the 1980s to 4 billion board-feet/year in the 1990s. Clear cutting has been reduced from 250,000 acres/year in the 1980s to 100,000-120,000 acres/year in the 1990s. Because of these changes in management, the net biomass flux from national forests has gone from a minus 60 MMTCE/year in the 1980s to a net gain of 40 MMTCE/year, and is continuing upward.

FACT SHEET ON STATE AND LOCAL CLIMATE CHANGE PROGRAM

N O V E M B E R 1 9 9 8

The **State and Local Climate Change Program** has been helping states and communities reduce emissions of greenhouse gases for the past 9 years. Administered by the Environmental Protection Agency (EPA), this capacity-building program provides states and local governments with guidance and technical information to help them prepare inventories of their greenhouse gas emissions, assess and build awareness of the impacts of climate change, and develop action plans to reduce emissions. The program also provides technical and financial assistance to help states integrate climate change initiatives with existing state programs. The goal of this technical and financial assistance is to encourage state and local decision makers to implement voluntary measures to reduce greenhouse gas emissions.

Between 1992 and 1997, the State and Local Climate Change Program allocated more than \$7 million in grants and other awards for state greenhouse gas emissions inventories, action plans, demonstration projects, and education and outreach programs. Based on initial estimates, the program will help reduce U.S. greenhouse gas emissions by an amount equal to 1.9 million metric tons of carbon (MMTCE) by 2000 and 4.2 MMTCE by 2010.

STATES AND LOCAL GOVERNMENTS ARE ACTING

Currently, 34 states and Puerto Rico participate in the program, accounting for nearly 60 percent of total U.S. carbon dioxide emissions. These 34 states and Puerto Rico have started or completed inventories of their emissions of carbon dioxide and other greenhouse gases. Twenty-five of these states also have taken additional steps, such as setting up task forces and starting or completing action plans to curb their state's greenhouse gas emissions.

SUCCESS STORIES

Some examples of how state and local governments are addressing climate change, utilizing assistance from the EPA's State and Local Climate Change Program, include the following:

- After completing a greenhouse gas inventory, **New Jersey** issued an executive order to reduce its greenhouse gas emissions 5% below 1990 levels by 2005. New Jersey also is creating a Greenhouse Gas Bank and has signed a letter of intent with The Netherlands that establishes a framework for developing joint initiatives to address global warming, including an emissions trading system.
- **California** boasts the largest and most diverse renewable energy generation industry in the world. Renewable resources provide 11% of all electricity used in the state. The 1998 inventory reported that electric generation in 1994 produced only about 16% of all carbon-related emissions in California.
- The State of **Oregon** introduced state legislation and business tax credits to encourage transportation efficiency. Today Oregon is one of the nation's leaders in the field of telecommuting (working at home using telecommunications equipment, including the telephone, fax, and internet). Approximately 7-8% of Oregon's workforce currently telecommutes.

FACT SHEET ON THE U.S. COUNTRY STUDIES PROGRAM

N O V E M B E R 1 9 9 8

The U.S. Country Studies Program (USCSP) was announced in 1992, at the "Earth Summit" in Rio de Janeiro, Brazil. The purpose of the program is to provide financial and technical assistance to developing countries and countries with economies in transition in addressing the problem of global climate change, particularly within the context of the U.N. Framework Convention on Climate Change (UNFCCC). Since 1993, funding for the Country Studies Program has totaled \$40 million. The program assists countries to:

- Inventory their emissions of greenhouse gases;
- Assess their potential vulnerability to climate change and approaches for adapting to such change;
- Identify and evaluate options for controlling these gases or increasing sinks;
- Develop national plans for responding to climate change;
- Assess related technological needs; and
- Increase public understanding of climate change.

ACHIEVEMENTS

- **China:** Since 1994, the People's Republic of China (PRC) has been active in several areas of the U.S. Country Studies Program. China's completed country study includes a greenhouse gas emissions inventory, an assessment of the PRC's potential vulnerability to climate change in a number of sectors, and an evaluation of technologies and strategies for mitigating climate change. The Country Studies Program also has provided technical assistance for the development of a national climate change action plan, which will be completed in early 1999.
- **Mexico:** Since 1993, the U.S. Country Studies Program has worked with Mexico on the development of a greenhouse gas emissions inventory, an assessment of Mexico's potential vulnerability to climate change, the development of future emission scenarios, the identification and evaluation of measures for adapting to or mitigating climate change, and the development of a national action plan.
- **Egypt:** With the support of the U.S. Country Studies Program, the Egyptian Organization for Energy Conservation and Planning (OEEP) coordinated a 2-day workshop in June 1997 on its "National Action Plan and National Communication." The workshop was organized to present the Framework of Egypt's National Action Plan (developed with USCSP support), Egypt's climate change program, and guidelines for the preparation of its first National Communication to the Framework Convention on Climate Change. The former governor of Alexandria, the head of the Egyptian Environmental Affairs Agency, and the chairman of OEEP led the workshop, which was attended by high-level government officials, industrialists, non-government organizations, and representatives of the media.

HOW IT WORKS

To enhance the long-term capacity of developing and transition countries to address the problem of climate change and to participate fully in the international response to this problem, the U.S. Country Studies Program provides participants with financial support, training, technical assistance, computer equipment, data, analytical tools, and information services. Fifteen senior officials from the participating countries have helped shape the program by working for a number of months each with the Country Studies Management Team in Washington. Thus, handbooks to guide studies, state-of-the-art simulation models, and analytical methodologies and tools have been tailored to meet the needs of the countries. During the life of the program, training has been provided in 10 global training workshops and over 20 regional workshops. Building on the work of analysts from developing and transition countries, more than 350 publications and journal articles have been produced, including 10 guidance documents, 60 workshop and conference proceedings, more than 160 country reports, and 17 special journal editions.

WIDE PARTICIPATION

Fifty-five countries have been involved in the Country Studies Program since 1993. Forty-three countries have received support for the development of greenhouse gas emission inventories, and 26 have submitted final emission inventories. Forty-nine countries have received support for conducting vulnerability and adaptation assessments, and 34 have completed these assessments. Thirty-four countries have initiated studies of mitigation options, and 27 have completed these studies. Eighteen countries have initiated the development of national action plans, and 4 have completed these plans.



Biography

Stuart E. Eizenstat

Under Secretary of State for Economic, Business and Agricultural Affairs

On June 6, 1997, Stuart E. Eizenstat was sworn in as Under Secretary of State for Economic, Business and Agricultural Affairs. The Under Secretary serves as the senior economic official at the Department of State. He advises the Secretary on international economic policy and leads the work of the Department on issues ranging from trade and aviation negotiations to bilateral relations with major partners such as Japan and the European Union. Ambassador Eizenstat retains his title and responsibilities as Special Envoy for Property Claims in Central and Eastern Europe.

From April 5, 1996 to June 6, 1997, Ambassador Eizenstat was Under Secretary of Commerce for International Trade. At Commerce, Under Secretary, Eizenstat led the U.S. Department of Commerce's International Trade Administration, which has responsibility for promoting U.S. exports, assisting American business efforts abroad, enforcing laws against unfair trade practices and developing trade policy.

Eizenstat served as the U.S. Representative to the European Union (The United States Senate confirmed the nomination on July 30, 1993 and the Ambassador presented his credentials in Brussels on September 23, 1993). At the time of his nomination, he was Partner and Vice Chairman of the law firm, and Chairman of the Washington office, of Powell, Goldstein, Frazer & Murphy, where he had been since 1981. He concurrently served as Adjunct Lecturer at the John F. Kennedy School of Government at Harvard University, Cambridge, Massachusetts, and was a Guest Scholar at the Brookings Institution in Washington.

From 1977 to 1981, Mr. Eizenstat served as President Carter's Assistant for Domestic Affairs and Policy and Executive Director of the Domestic Policy staff at the White House. In 1976, he had joined the Carter Presidential campaign full-time as Director of Issues and Policy; after the election, he became the Carter-Mondale Transition Planning Group's Director for Policy, Planning and Analysis.

From 1968 to 1970, Mr. Eizenstat worked in Atlanta as law clerk to U.S. District Court Judge Newell Edenfield, Northern District of Georgia, and, from 1970 to 1976, as attorney and partner, Powell, Goldstein, Frazer & Murphy. Ambassador Eizenstat has written extensively in leading newspapers, magazines, and legal publications, and co-edited a book, *The American Agenda*.

At the time of his nomination as Ambassador, Eizenstat sat on the boards of such non-profit organizations as the Weizmann Institute of Science, The Jerusalem Foundation, Brandeis University, Council on Foreign Relations, Council for Excellence in Government Center for National Policy, Overseas Development Council, International Management and Development Institute (Jerusalem), American Jewish Committee, and the UJA Federation of Greater Washington, and was chairman of the Feinberg Graduate School of the Weizmann Institute. He also was on the Board of Directors of Hercules Incorporated, PSI Energy, Inc., and the Israel Discount Bank of New York.

In 1996, at the conclusion of his service as U.S. Ambassador to the European Union, Ambassador Eizenstat received from Secretary of State Warren Christopher the highest award which can be given to a non-career Ambassador, the Foreign Affairs Award for Public Service.

Stuart Eizenstat was born in Chicago in 1943. He is an honors graduate in political science of the University of North Carolina at Chapel Hill and received his law degree from Harvard University in 1967. His distinguished career in government began during his university years, when he spent three summers (1963, 1964, and 1966) working as an intern for both the legislative and the executive branches of the Federal Government. In 1967-68, he served as a staff aide in the Johnson White House and in 1968 as Research Director for Vice President Hubert Humphrey's Presidential Campaign.

His biography appears in Who's Who in America, Who's Who in American Lawyers, Who's Who in American Jewry, Who's Who in World Jewry, who's Who Among Intellectuals, Who's Who in American Politics, and Who's Who in the World. He has received numerous awards throughout his years in public service, including the Export Enhancement Award, U.S. Coalition for Employment Through Exports, 1993; Israel Bond Award, 1992; Jewish Leadership Award, the Academy of Jewish Religion, 1989; Man of the Year Award from the National Capital Association of B'nai B'rith Lodges, 1982; U.S. Department of Labor Award for Special Contributions to Youth Employment, 1980; Award from the Washington International Business Council, 1978; and Young Man of the Year Award for Leadership, American Association for Jewish Education, 1973-74.

Ambassador Eizenstat is married to Frances Carol Eizenstat and is the father of two sons, Jay and Brian.

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Biography

Melinda L. Kimble

Acting Assistant Secretary of State,

Oceans and International Environmental and Scientific Affairs (OES)

Melinda Kimble was named Principal Deputy Assistant Secretary for Oceans and International Environmental and Scientific Affairs (OES) in August 1997. As there was no Assistant Secretary at that time, she also became Acting Assistant Secretary. OES develops and implements U.S. policy on international science and technology, fisheries, oceans, and global environmental issues.

Previously, Ms. Kimble served as Deputy Assistant Secretary in the Bureau of International Organization Affairs (IO), where she oversaw U.S. policy toward a wide range of economic and social issues in the United Nations. In this capacity, she developed the U.S. negotiating strategies for recent UN conferences, including Cairo, Copenhagen, and Beijing.

Kimble is a career Foreign Service Officer, joining the Department of State in January 1971. She was promoted to the Senior Foreign Service in 1989, and promoted to the rank of Minister Counselor in 1993. Before assuming her IO position, Kimble was the Director of the Office of Egyptian Affairs in the Near East and South Asia Bureau. From 1987 to 1989 she served as the Deputy and Acting Director of the Office of Monetary Affairs in the Economic and Business Bureau. She has also served in Tunisia, Egypt, and Cote d'Ivoire as well as in the Africa Bureau in Washington.

Kimble has bachelor's and master's degrees in economics from the University of Denver and a master's from Harvard. She is a recipient of the Department of State's Meritorious, Superior, and Distinguished Honor Awards, senior performance pay, a Presidential Performance Award, an award from the Global Alliance for Women's Health, and an International Honor Award from the U.S. Department of Agriculture. Her foreign languages are Arabic and French. She is married to James R. Phippard, a former career AID official, and has four grown stepchildren.

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BIOGRAPHY

Todd Stern

Assistant to the President for Special Projects

Todd Stern, Assistant to the President for Special Projects, currently manages the Clinton Administration's overall effort on the issue of global climate change, including domestic policy, diplomatic efforts, communications, congressional relations and outreach. He has formally been in this position since March 1998. Mr. Stern's work on climate change began in July 1997, when he has asked to lead a public education and outreach effort on climate change and to participate at the senior level in the formulation of domestic and diplomatic policy. He participate in the Kyoto Conference on Global Climate Change as the senior White House representative on the American delegation.

Previously, from June 1995 until March 1998, Mr. Stern served as Assistant to the President and Staff Secretary. As Staff Secretary, Mr. Stern managed the flow of paper to and from the President and coordinated senior staff comment on decision memoranda and other Presidential documents. This position required a working familiarity with the broad range of domestic and foreign policy issues addressed by the President. He also took on a number of special assignments on policy and other matters.

Mr. Stern joined the Administration as Deputy Staff Secretary with duties similar to those he handled as Staff Secretary. He held this position from January 1993 until June of 1995.

From 1990 to 1993, Mr. Stern served as Senior Counsel to Senator Patrick Leahy on the Senate Judiciary Committee. His principal responsibilities there included intellectual property, telecommunications, trade, antitrust, Supreme Court nominations and speech writing. Before that, he was Vice President at Podesta Associates, a Washington, D.C. government relations and public affairs firm.

Before coming to Washington, Mr. Stern practiced law in New York, principally at Paul, Weiss, Rifkind, Wharton & Garrison, where he was a litigator. He also served as General Counsel to Associated Mills/Pollenex, a Chicago manufacturer.

Mr. Stern graduated from Harvard Law School (cum laude) in 1977 and from Dartmouth College (summa cum laude) in 1973. He is married to Jennifer Klein, Special Assistant to the President for Domestic Policy and an advisor to the First Lady. They have a son, Jacob, who is nearly two.

Cut-price emissions

Emissions trading is good for the world economy and the environment

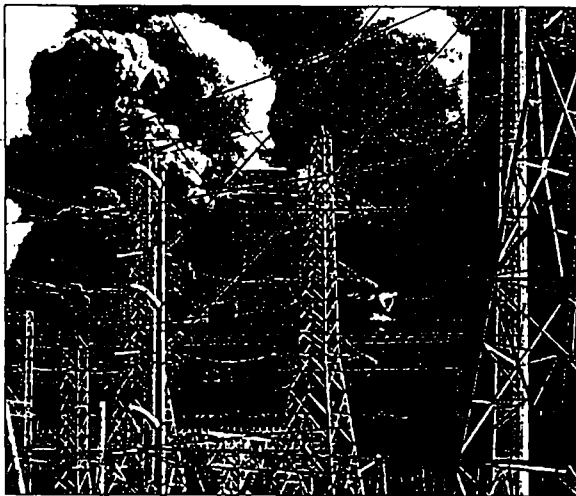
On November 2 in Buenos Aires, the parties to the agreement on global climate change reached in Kyoto last December will gather to pursue the hard work of filling in the blanks to that historic accord. But a controversy over how to implement critical market-based provisions negotiated last year threatens to disrupt the steady progress that should be everyone's goal.

The Kyoto protocol sets ambitious targets for developed countries to reduce their greenhouse gas emissions, which most scientists believe are causing higher temperatures and disrupting the world's climate patterns. Preserving a stable and hospitable climate will require a sustained commitment to reduce emissions over time. That is why it is so important, right from the start, to focus on how countries can meet their targets at the lowest possible cost.

This link between ambitious environmental targets and low-cost implementation was central to the success of the Kyoto negotiations. In the protocol, parties agreed that countries may meet their targets through a combination of domestic and international actions, including "emissions trading". This is a market mechanism that promotes cost-effective reductions by allowing countries or companies to trade emissions allowances. Without this flexibility, it simply would not have been possible to take on targets as ambitious as we agreed to in Kyoto.

Unfortunately, many countries and organisations most passionately committed to solving the problem of climate change are, in our view, mistakenly opposed to emissions trading or determined to place counter-productive restrictions on it. If this view succeeds, it will dramatically increase the costs of protecting our environment and imperil many countries' ability to go forward with Kyoto.

Emissions trading is the key to strong targets because it makes possible the largest greenhouse gas reductions for each available



Up for sale: companies will have to pay for the right to pollute

dollar, mark, pound, franc, or yen. In America's acid rain emissions trading programme, every emitter must have an allowance for each ton of sulphur dioxide it emits. For some emitters, the cost of cutting a ton of emissions is many times greater than for others. Those who find the cheapest ways to cut emissions are tangibly rewarded, because they can sell any allowance they do not need to others that face higher costs.

The results speak for themselves. US acid rain-causing emissions are being cut ahead of schedule at 50 per cent of the expected cost, bringing cleaner air to millions of Americans. Economists of every stripe agree that the costs of reducing greenhouse gas emissions for all countries – not just the US – will be dramatically lower with an efficient trading system. Within the European Union alone, measures to control greenhouse gases are as much as six times more expensive in some countries than in others, according to European private sector analysts. The cost differences are even greater when looking at all industrialised countries, and greater still between developed and developing countries. Trading gets the incentives right by encouraging cuts where they can be achieved at the lowest cost.

Of course, emissions trading is not a substitute for an aggressive national commitment to controlling greenhouse gases. Rather, it is

just one tool for carrying out such a commitment. The US has been pursuing nearly 50 programmes to reduce emissions and improve energy efficiency since 1993, the year after it ratified the original climate change treaty. In October last year, President Bill Clinton proposed a significantly stepped-up effort, including \$6.3bn over five years in tax incentives and R&D to cut carbon dioxide through increased energy efficiency and renewable energy, and to reduce the other greenhouse gases. In the recently completed budget negotiations, the president secured a 25 per cent increase in climate change investments over last year's total.

The US plan also includes restructuring the electricity industry to provide market incentives for renewables and increased efficiency; consultations with industry to develop sector-by-sector plans to reduce emissions; an aggressive plan to improve the federal government's own use and procurement of energy; and ultimately, after US ratification of the Kyoto protocol, a greenhouse gas emissions trading programme based on our acid rain experience.

We recognise that many people have questions about how emissions trading can be made to work internationally. Some are concerned about weaknesses in national and international institutions to measure emissions and ensure compliance. That is why the US is committed to building an

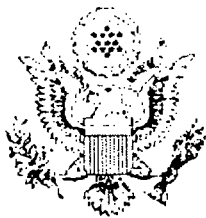
international trading system of the highest integrity, with strong incentives for compliance. In fact, the US is already working with a number of developed and developing countries to help strengthen their capacity to measure emissions and participate in an emissions trading system with high standards.

Others have argued for limits on how much of a nation's Kyoto target can be met through international emissions trading. This is a deeply flawed idea. Limits on trading would greatly increase administrative costs, be exceedingly difficult to implement, and generally make it much more expensive to address climate change.

In fact, the adverse impact would be even greater in Europe than in the US: restrictions currently proposed by some governments could well double carbon allowance prices in the US and triple those allowance prices in the EU – without providing any reductions in worldwide greenhouse gas emissions beyond the targets established in Kyoto. Limiting trading will make any given amount of emissions reductions cost more. It makes little sense to waste resources at a time of uncertain growth prospects in the global economy, nor to limit the potential of emissions trading to spur investment and innovation and to expand job opportunities.

We owe it to future generations to protect them from the damaging effects of climate change. That is why it is vital that Buenos Aires build on the momentum generated at Kyoto. The best way to protect the environment is to provide the right economic incentives and, by so doing, get the fastest, deepest reductions at the lowest possible cost. Let us work together, do this right, and take good care of both the world's environment and its economy.

Carole Browner is the administrator of the US Environmental Protection Agency. Stuart Eizenstat is US under-secretary of state for economic, business and agricultural affairs



United States Information Agency

FIGHTING GLOBAL WARMING: FROM KYOTO TO BUENOS AIRES AND BEYOND

Speech by Stuart E. Eizenstat
Under Secretary of State for Economic, Business, and Agricultural Affairs

Center for National Policy
October 28, 1998

Good morning. I am especially pleased to be at the Center for National Policy. I was present at its creation and involved in its initiation, served on its Board for many years, and became a great admirer of Mo Steinbruner, the Center's talented President. I want to talk about the progress the Administration has made on climate change, and what we hope to accomplish at the upcoming negotiations in Buenos Aires. I had the privilege of heading the U.S. team in Kyoto, and will do so again in Buenos Aires. We have a fine team of experts working on this issue. It shows the tremendous progress we have made towards achieving an international approach that can insure at a reasonable cost against the potential damage of climate change.

In just under a year since some 160 countries reached the historic Kyoto agreement on climate change at the third Conference of the Parties (COP3), we have made significant progress on multiple fronts. We look to COP4 in Buenos Aires not as a place for spectacular diplomatic breakthroughs as we accomplished in Kyoto, but as a significant milestone in efforts to consolidate our gains and to make concrete and operational our Kyoto achievements.

Kyoto Accomplishments: Kyoto was a genuine breakthrough. For the first time markets will be put to work to help international efforts to address an environmental problem -- climate change, the most profound environmental challenge of the 21st Century. International action was taken in response to powerful scientific consensus that global warming is indeed occurring, and that the cause is greenhouse gas emissions related to human activity. In Kyoto, industrialized countries took on binding targets to cut aggregate emissions by 5.2% below 1990 levels.

The Protocol reflects the environmentally and economically sound approach of the United States. It is strong and realistic; it is market-based and flexible. As

the U.S. called for, the Protocol established a commitment period of 2008 to 2012, which gives us start-up time to adjust and a five-year period over which to achieve our emissions reduction goal. As we wanted, the Kyoto agreement also provided similar but differentiated targets among developed countries to allow for varying economic profiles and levels of industrialization. We achieved the inclusion of all six gases that contribute to the problem, over the objections of the European Union and Japan. The United States also pressed successfully for coverage of carbon "sinks" in the Protocol, knowing that agriculture and forestry practices can help reduce carbon in the atmosphere and should be recognized as a tool in fighting global warming.

Perhaps the greatest achievement at Kyoto was the inclusion of the market-based, approach with flexibility mechanisms we championed to supplement domestic measures to reduce greenhouse gas emissions. These mechanisms provide the flexibility and incentives to help us find the least-cost reductions worldwide to achieve Kyoto's overall emissions target. The flexibility mechanisms include international emissions trading, the Clean Development Mechanism (CDM), and Joint Implementation (JI).

Emissions trading enables those countries with binding emissions targets to participate in an international market that for the first time gives explicit value to emissions reductions. If the cost of abatement in a given country is low by world standards, and that country is therefore able to get below its emissions target, it would have allowances to sell to those countries where abatement costs are relatively high. Both a seller and a buyer willing to pay for the allowance would have to play by the rules.

Kyoto's Clean Development Mechanism, involves voluntary, project-based investments by developed countries and their firms in developing countries. These would be win-win investments. Countries with binding emissions targets would get credit toward their targets for making beneficial investments in developing countries that provide capital and clean technology. Developing countries would get world-class technology as developed countries act to meet their targets. Joint Implementation allows developed country investors to share efforts on environment-friendly projects that limit emissions, and to share credit for the results against their emissions targets.

The Administration's economic analysis underscores the importance of trading in achieving emissions reductions agreed at Kyoto in a cost-effective manner. It shows that an effective international market for trading emissions allowances among industrialized countries alone could dramatically lower the resource cost to the United States. At the same time, making agreed reductions in greenhouse gases would help the United States avoid the damage of climate change, which some estimates place in the billions of dollars annually, and enjoy related health and other benefits. Moderate estimates of the economic cost of meeting the Kyoto targets assume implementation of the very flexibility mechanisms for which we fought at Kyoto, and now work to make a reality.

The Kyoto framework reflects both the view that climate change is a serious,

global environmental problem which must be addressed at the lowest cost to the world economy, and the experience that it can be done without a large bureaucracy, overly-intrusive regulation or high taxes. The trading system used in our domestic SO₂ program to reduce acid rain, for example, has achieved our environmental goals at just 50 percent of initial cost estimates. Despite the complexity of making Kyoto's provisions operational, and the need to build confidence in the international community that we can make them work to the benefit of all, much has happened in the last year to make this task all the more urgent.

It is becoming harder for skeptics to contest the science. Significant new findings over the past year reinforce the broad, scientific consensus that human activities are disrupting the earth's climate. New analyses of tree ring, ice melt, borehole and satellite data provide further evidence that global temperatures are rising as a result of increasing concentrations of greenhouse gases. Following 1997, the hottest year on record, the first nine months of 1998 have been even hotter. This year's extreme weather events have been of historic proportion and devastating cost - from raging fires in Indonesia, the Amazon, Florida and Mexico, to drought in Texas followed by life-threatening floods, and floods in China and Bangladesh that left tens of thousands homeless, hungry and sick. These events are a window on what the Earth may be like with global warming.

Progress This Year: The past year has also seen tremendous progress in our fight against global warming. First, we have stepped up our domestic efforts. Since ratifying the original climate change treaty in 1992, the United States has put more than 50 domestic programs in place to help address the problem. There should be no doubt about our commitment to aggressive, domestic action. In just-completed budget negotiations, the Clinton Administration secured a 25 percent increase in investments against climate change -- in energy efficiency, renewables and R&D -- with resources now totaling some \$1 billion for FY1999. These funds will go to a wide array of programs such as the Partnership for the Next Generation Vehicle, where we expect to see new U.S. cars in production early in the next decade with triple the gas mileage of today's cars, and the Partnership for Advancing Technology in Housing, or PATH, which will make new housing up to 50 percent more energy efficient. In addition, the Administration's electricity restructuring plan will increase efficiency, spur renewables and help cut emissions as well.

The Administration will come back with a request for more in the FY2000 budget, including added emphasis on incentives for farmers and others to explore opportunities in biofuels and to identify how land use practices can help clean carbon from the air. These are promising areas through which our agriculture and forestry sectors may well benefit from our efforts against global warming. Second, the Administration has undertaken intensive consultations and mutual education efforts with business, agriculture and other citizens groups. We have successful discussions with industry groups to improve energy efficiency and cut emissions. Credit for early action on climate change is high on their list of priorities and on ours, so we welcome the bipartisan legislation on this issue recently introduced by Senators Chaffee, Lieberman and Mack.

Industry is taking active steps already. Important companies such as IBM, Sunoco, British Petroleum, Shell, United Technologies and Intel have recently committed to reduce significantly their greenhouse gas emissions. BP is putting in place an internal trading system designed to keep the cost of meeting this goal as low as possible. We will be very interested in the results of these innovative efforts.

Third, over the last year, we have also mounted a comprehensive diplomatic effort to encourage developing countries to become meaningfully involved in limiting the increase in their emissions, consistent with needed growth. While we intend to sign the Protocol to help lock in the gains made at Kyoto, the President has indicated he will not submit the Kyoto Protocol for advice and consent by the Senate without meaningful participation by key developing countries. Many developing countries remain resistant to emissions targets, and mistrust the flexibility mechanisms. But our discussions with them have become more regular, substantive and detailed and they are becoming aware of their potential vulnerability to climate change, and of the benefits of taking action.

We are engaged with dozens of developing countries through our bilateral assistance programs to encourage them to take steps toward sustainable development. With \$193 million appropriated for the Global Environmental Facility in this year's budget talks to cover U.S. arrears, the Facility should be able to complement some of these efforts through their climate-related programs.

Developing Countries: In our approach to developing countries, we find it helpful to group them into several categories. This recognizes the substantial differences among them in terms of emissions profiles, levels of development, capacity for effective action, and economic and political conditions. One category of developing countries combines relatively high-income developing and newly industrialized countries. This includes new members of the OECD and those nations that aspire to OECD membership. We have not only pressed hard bilaterally for their participation, but have achieved the backing of other countries to urge them to take on binding growth targets to limit the rate of increase in their emissions.

In another category are large emitters with low incomes. While none of these countries to date has indicated a willingness to take on quantitative targets, we have engaged vigorously with them at the highest levels and will continue to do so. In our discussions we emphasize strongly that flexibility mechanisms such as emissions trading and the Clean Development Mechanism will not only reduce greenhouse gases, but offer powerful financial incentives for new investments in their economies. The United States now has in place a high-level dialogue with China, for example, through which we have stressed the potential impacts of climate change on China as well as the health, energy efficiency and other benefits of early action.

There is another, mixed category of middle-income countries of varying sizes and emissions levels. Here we see particular opportunities in Latin American

and the Caribbean. Argentina, as chair of the COP4 meeting is an important leader in this process. Brazil introduced the Clean Development Mechanism at Kyoto, and has led on renewable energy and alternative fuel strategies in the region. We have had setbacks in our progress with other middle income countries in Asia due to recent economic events, but we continue to work with them bilaterally and multilaterally.

Finally, there is a sizeable category of poor countries with low emissions and low incomes. Although climate change often poses serious potential threats to them, they have limited capacity to undertake the kinds of actions and commitments that we expect of countries with more advanced economies. These include, for example, most of Sub-Saharan Africa and the small island states that are uniquely vulnerable to climate change. We are working with such countries to build their capacity to participate in solving the global problem of climate change.

Buenos Aires and Beyond: At Kyoto we created the architectural structure of international efforts to address climate change. We hope Buenos Aires will create a process for installing the interior plumbing and circuitry to make Kyoto a reality.

First, in Buenos Aires we will oppose any backsliding on the grand bargain that was struck in Kyoto. At Kyoto, we joined others in taking on a strong emissions reduction target. We did it with the clear understanding that, like the European countries have done with their Bubble, we would be able to use the flexible, market-based Kyoto mechanisms without arbitrary limits to meet our obligations cost-effectively. That agreement must hold.

We have formed a successful alliance since Kyoto with eight other like-minded countries (including Canada, Japan and Russia) the "Umbrella Group" to develop common positions on Kyoto's flexibility mechanisms. With us they strongly oppose efforts by the EU countries to restrict the legitimate use of emissions trading and the other agreed flexibility mechanisms.

There should be no limit on how much the United States can do at home -- and we are making aggressive efforts -- but neither can there be a limit on what we can accomplish through agreed flexible mechanisms. We will adamantly oppose efforts to set arbitrary limits on trading. They threaten to undo the Kyoto agreement, and would impose unsustainable costs on the U.S. economy and actually discourage deeper reductions in greenhouse gas emissions.

Second, we will stress that Buenos Aires should avoid divisive polemics regarding caps on the flexibility mechanisms and concentrate instead on developing a work plan and a working group process, with clear timetables for elaborating the rules for trading and the other market mechanisms. This is urgent if we are to make sufficient progress to have the CDM up and running by 2000 as the Protocol provides. At the same time, the rules must not entail too much red tape or excessive bureaucracy. The Buenos Aires work plan must also recognize the need to develop appropriate mechanisms for measurement,

reporting and compliance in a system with high standards.

Third, we will hold intensive bilateral and multilateral discussions directly with developing countries and work to build the momentum for action. We cannot solve the problem without them. It is critical that we strongly encourage discussion of these issues among the Parties in Buenos Aires and strive for progress on developing country participation. We will encourage developing countries to see that it is in their interest to take committed action and to view the Conference of the Parties as a venue to work together to address climate change responsibly, so that it promotes their sustainable development.

November's international negotiations on climate change in Buenos Aires will not have the glamour and novelty of Kyoto. But they can advance the tough work needed to make Kyoto's remarkable promise a reality. We hope to get beyond rhetoric and ideology and shape the tools needed to get the job done for the benefit of all.

Thank you.

Climate Change

Acid fog	Niebla ácida
Acid precipitation (wet or dry precipitation of and increased acidity, generated by the release of sulphates or nitrates in the atmosphere)	Precipitación ácida
Acid rain	Lluvia ácida
Action Plan for the Programme of Studies on the Impact of Climate on Mankind (submitted to the World Climate Conference)	Plan de Acción del Programa de Estudios del Impacto del clima en la Humanidad
Active chlorine	Cloro activo
Acyclic hydrocarbons	Hidrocarburos acíclicos
<i>Ad Hoc</i> Working Group of Legal and Technical Experts for the Elaboration of a Global Framework Convention for the protection of the Ozone Layer (UNEP)	Grupo de Trabajo <i>ad hoc</i> de expertos jurídicos y técnicos encargados de elaborar un convenio que sirva de marco mundial para la protección de la capa de ozono
<i>Ad Hoc</i> Working Group of Legal and Technical Experts for the Harmonization of Data on Production, Imports and Exports of Substances that Deplete the Ozone Layer (UNEP)	Grupo de Trabajo <i>ad hoc</i> de expertos jurídicos sobre el incumplimiento del Protocolo de Montreal
<i>Ad hoc</i> Working Group of Legal and Technical Experts for the Preparation of a Protocol on Chlorofluorocarbons to the Vienna Convention for the Protection of the Ozone Layer, Vienna Group (UNEP)	Grupo de Trabajo <i>ad hoc</i> de expertos jurídicos y técnicos encargado de elaborar un protocolo relativo a los clorofluorocarbonos del Convenio de Viena para la Protección de la Capa de Ozono
Ad Hoc Working Group of Legal Experts on Non-compliance with the Montreal Protocol (UNEP)	Grupo de Trabajo especial de expertos jurídicos sobre el incumplimiento del Protocolo de Montreal
Advisory Group on Greenhouse Gases, AGGG (WMO/ICSU/UNEP)	Grupo Asesor sobre gases de efecto de invernadero
Aerosol (system of colloidal particles dispersed in gas)	Aerosol
Aerosol load (dirt and dust particles in the atmosphere)	Carga (o contenido) de aerosoles en la atmósfera

Aerosol (spray) can	Vaporizador de aerosol; bomba de aerosol.
Agroclimatic	Agroclimatológico
Agrometeorological station	Estación agrometeorológica
Air chemistry; atmospheric chemistry (branch of meteorology concerned with the chemical composition of the atmosphere)	Química atmosférica
Air pollutant	Contaminante atmosférico
Air pollution load	Carga contaminante de la atmósfera
Air-sea interaction; ocean-atmosphere interaction	Interacción aire-océano
Airborne particulates	Partículas en suspensión en le aire
Albedo	Albedo
Alkane	Alcano
Alternative fluorocarbons	Otros fluorocarbonos
Antarctic spring ozone depletion	Disminución del ozono observada durante la primavera antártica
Anthropogenic	Antropogénico
Arctic ice pack	Bloques de hielos árticos
Assessment panel (UNEP)	Grupo de evaluación
Atmosphere-ocean-land-ice system	Sistema atmósfera-océano-tierra-hielo
Atmospheric chemistry; air chemistry (branch of meteorology concerned with the chemical composition of the atmosphere)	Química de la atmósfera

Atmospheric chlorine	Cloro atmosférico
Atmospheric dynamics	Dinámica de la atmósfera
Atmospheric lifetime (of a substance)	Permanencia en la atmósfera (de una sustancia)
Atmospheric residence time (e.g. of ozone-depleting substances)	Período de permanencia en la atmósfera
Automatic satellite reporting	Transmisión automática por satélite
Background Air Pollution Monitoring Network, BAPMoN	Red de estaciones de control de la contaminación general atmosférica
Background monitoring stations	Estación de control de la contaminación general
Balloon ozone sounding	Sondeos de la capa de ozono por globo
Baseline observing station	Estación de observación de referencia
Bioclimatology (study of the influences exerted on living organisms by climate)	Bioclimatología
Biomass	Biomasa
Biome (the largest geographical biotic unit; an ecological formation considered in terms of both plants and animals of the area concerned)	Bioma
Biosphere (the sphere of living organisms)	Biósfera
Biota (animal and plant life of a region)	Biota
Bromochlorodifluoro-methane, Halon 1211	Bromoclorodifluoro-metano, Halon 1211
Bromoform, CHBr ₃	Bromoformo
Bromotrifluoromethane, Halon 1301	Bromotrifluorometano, Halón 1301

Bureau for the Vienna Convention (Convention for the Protection of the Ozone Layer)	Mesa del Convenio de Viena
Bureau of the Conference of the Parties (proposed subsidiary body of the Conference of the Parties under article 6 para. 4 I) of the Vienna Convention	Mesa de Conferencia de las Partes
Carbohydrates	Carbohidratos
Carbon dioxide, CO ₂ (normal constituent of air; the most important greenhouse gas)	Dióxido de carbono; bióxido de carbono; anhídrido carbónico
Carbon families	Derivados del carbono
Carbon monoxide, CO	Monóxido de Carbono
Carbon sink	Sumidero de Carbono
Carbon tetrachloride, CCl ₄	Tetracloruro de carbono
Carbonic acid, H ₂ CO ₃ (produced by reaction of carbon dioxide with water vapour)	Acido carbónico
Changes in weather patterns; climate variations	Variaciones climáticas
Chlorine monoxide radical	Radical de monóxido de cloro
Chlorine substances	Derivados de cloro; sustancias cloradas
Chlorofluorocarbon, CFC (any of several compounds composed of carbon, fluorine and hydrogen; used as propellants, refrigerants, solvents)	Clorofluorocarbono, CFC
Chlorofluoromethane, CFM (used e.g. for refrigeration agents, spray-can propellants)	Clorofluorometano, CFM
Chloropentafluoroethane, CFC 115; C ₂ ClF ₅	Cloropentafluoroetano
Circumpolar vortex	Vórtice circumpolar

CLICOM (CLImate COMputing) (WMO system for data information management on climate)	CLICOM
Climate Applications Referral System. CARS (WMO)	Sistema de referencia de aplicaciones climáticas. CARS
Climate change; climatic change	Cambio climático; evolución del clima
Climate Change Detection Project (WMO)	Proyecto de detección de los cambios climáticos
Climate control	Control del clima
Climate model	Modelo climático
Climate monitoring	Vigilancia del clima
Climate system monitoring. CSM (WCDP)	Control del sistema climático. CSC
Climatic optimum; megathermal period	Calentamiento óptimo climático; período megatérmico
Climatology (numerical description, by means of charts, tables, diagrams, texts, etc., of the components of the climate of a region)	Climatografía
Climatology (branch of meteorology concerned with the physical state of the atmosphere during specified periods of time and within specified geographic areas)	Climatología
Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe. EMEP (UN-ECE/WMO/UNEP)	Programa de vigilancia y evaluación del transporte de contaminantes atmosféricos a larga distancia en Europa
Co-ordinating Committee on the Ozone Layer. CCOL (UNEP)	Comité Coordinador sobre la capa de ozono

CO ₂ equivalent (expression of the amount of each greenhouse gas in terms of the amount of CO ₂ (carbon dioxide) that would produce the same radiative effect)	Equivalente CO ₂
Column content of ozone	Contenido de ozono de una columna atmosférica
Commission for Climatology, CCI (WMO)	Comisión de Climatología, CCI
Committee of the Whole (Conference of Plenipotentiaries on the Protection of the Ozone Layer) (UNEP)	Comisión Plenaria (Conferencia de Plenipotenciarios sobre la Protección de la Capa de Ozono)
Committee of the Whole (UNEP Governing Council)	Comité Plenario (del Consejo de Administración del PNUMA)
Conference of Experts on Climate and Mankind, World Climate Conference	Conferencia de expertos sobre el clima y el hombre
Conference of Plenipotentiaries on the Protection of the Ozone Layer (UNEP)	Conferencia de Plenipotenciarios sobre la Protección de la Capa de Ozono
Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer (UNEP)	Conferencia de las Partes en el Convenio de Viena para la Protección de la Capa de Ozono
Conference on Climate and Water	Conferencia sobre el Clima y el Agua
Conference on Climate Change and Greenhouse Gases (sponsored by ICSU/UNEP/WMO)	Conferencia sobre el Cambio Climático y los Gases de Efecto de Invernadero
Conference on the Human Environment; United Nations Conference on the Human Environment	Conferencia de las Naciones Unidas sobre el Medio Humano
Containment (of controlled substances)	Almacenamiento (de sustancias controladas)
Controlled substance (listed in Annex A to the Montreal Protocol)	Sustancia controlada

Convention for the Protection of the Ozone Layer	Convenio para la Protección de la Capa de Ozono
Convention on Long-range Transboundary Air Pollution (UN-ECE)	Convenio sobre la contaminación atmosférica transfronteriza a larga distancia
Convention of the Regulation of Antarctic Mineral Resources Activities (adopted by the Antarctic Treaty Consultative Parties)	Convención relativa a la reglamentación de las actividades relacionadas con los recursos minerales antárticos
Cryosphere (world's ice masses and snow deposits)	Criosfera
Data Rescue Project. CARE (project within the International Data Rescue Co-ordination Centre)	Proyecto de rescate de datos
Declaration of The Hague (signed by 24 countries on 11 March 1989 in order to establish a world authority for the protection of the environment)	Declaración de La Haya
Declaration of the United Nations Conference on the Human Environment; Stockholm Declaration; Declaration on the Human Environment	Declaración de la Conferencia de las Naciones Unidas sobre el Medio Humano
Declaration of the World Climate Conference (WMO)	Declaración de la Conferencia Mundial sobre el Clima
Deforestation	Desforestación; deforestación; despoblación forestal
Dendroclimatology; tree-ring climatology (study of climatic fluctuations from the annual growth rings of certain trees)	Dendroclimatología
Depletion (of the ozone layer)	Agotamiento (de la capa de ozono)
Desertification control; desiccation control	Control de la desertificación; control de desecación
Designated Officials for Environmental Matters, DOEM (ACC inter-agency consultative mechanism)	Oficiales designados para cuestiones ambientales (CAC; mecanismo consultivo interinstitucional)

Dibromotetrafluoroethane, Halon 2402	Dibromotetrafluoroetano, Halon 2402
Dichlorodifluoromethane, CFC 12	Diclorodifluorometano, CFC 12
Dichlorotetrafluoroethane, CFC 114	Diclorotetrafluoroetano, CFC 114
Dobson spectrophotometer, ozone spectrophotometer	Espectrofotómetro Dobson
Dobson unit (unit of measurement of the thickness of the ozone layer)	Unidad Dobson
Drought-prone region	Región propensa a la sequía
Earthly environment	Medio terráqueo
Earthwatch (UNEP) (a wide-ranging programme to gather and disseminate reliable environment information)	Vigilancia Mundial
Earth's atmosphere	Atmosfera terrestre
Environment Fund (UNEP)	Fondo para el Medio Ambiente
Environmental impact assessment, EIA	Evaluación del impacto ambiental
Environmental law	Derecho ambiental
Environmental Law and Machinery Unit (UNEP)	Dependencia de Derecho Ambiental
Environmental management	Ordenación del medio ambiente
Environmental Perspective to the Year 2000 and Beyond (UNEP)	Perspectiva Ambiental hasta el Año 2000 y Más Adelante

Environmental planning (measures aimed at creating a planned environment or at preserving or re-establishing a natural environment that is to be conserved)	Acondicionamiento de medio ambiente
Environmental refugee (a victim of disequilibria between population and environment)	Refugiado por motivos ambientales
Environmental stress	Tensiones ambientales
Environmentally sound development	Desarrollo ambientalmente racional
Environmentally sustainable development	Desarrollo ambientalmente sostenible
Eutrophication	Eutroficación
Exchange flux (energy transfer between land surface and atmosphere which has an influence on climate patterns)	Flujo de intercambio
Executive Council (WMO)	Consejo Ejecutivo
First Meeting of the Parties to the Vienna Convention for the Protection of the Ozone Layer	Primera reunión de las Partes en el Convenio de Viena para la Protección de la Capa de Ozono
First World Climate Conference (WMO)	Primera Conferencia Mundial sobre el Clima
Fluoride	Fluoruro
Fluorinated	Fluorado
Fluorine	Flúor
Forestry management	Ordenación de los bosques
Fossil fuel	Combustible fósil
Freon (Dupont de Nemours trade name for chlorofluoracarbon)	Gas Freón

Fuelwood	Leña
Fully halogenated alkane; perhalogenated alkane	Alcano totalmente halogenado
Fully halogenated chlorofluorocarbon; perhalogenated chlorofluorocarbon	Clorofluorocarbono totalmente halogenado
Geomorphological data	Datos geomorfológicos
Geophysical Monitoring for Climate Change Laboratory, GMCC (NOAA)	Laboratorio del Centro de Vigilancia Geofísica del Cambio Climático
Geosphere	Geosfera
Global Atmosphere Watch GAW (WMO)	Vigilancia de la Atmósfera Global, VAG
Global atmospheric circulation	Circulación atmosférica global
Global Atmospheric Research Programme, GARP (WMO)	Programa de Investigación Global de la Atmósfera, GARP
Global climate change	Cambio climático a nivel mundial; evolución del clima en el mundo
Global Environmental Monitoring System, GEMS (UNEP)	Sistema Mundial de Vigilancia del Medio Ambiente, SIMUVIMA
Global Monitoring for Climate Change Programme (NOAA)	Programa Mundial de Vigilancia de los Cambios Climáticos
Global Ozone Observing System, GO3OS (WMO)	Sistema Mundial de Observación del Ozono
Global Precipitation Climatology Centre (WCRP)	Centro Mundial de Climatología de la Precipitación
Global Resorce Information Database, GRID. (the Princial data managemente programme within GEMS)	Base de datos sobre recursos mundiales
Global warming	Calentamiento de la atmósfera; aumento de la temperatura mundial

Goals and Principles of Environmental Impact Assessment (UNEP)

Principios y Directrices para la Evaluación del Impacto Ambiental

Governing Council (UNEP)

Consejo de Administración

Greenhouse effect (the insulating effect caused by greenhouse gases, analogous to that of the glass in a greenhouse, i.e. transparent to incoming short-wave radiation but partly opaque to reradiated long-wave radiation)

Efecto de invernadero

Greenhouse gas, GHG

Gas que produce el efecto de invernadero

Greenhouse models

Modelos del efecto de invernadero

Greenhouse warming potential, GWP

Efecto potencial de invernadero

Gulf Stream

Corriente del Golfo

Halocarbon (halogen-substituted hydrocarbon)

Halocarbano; hidrocarburo halogenado

Halogenated derivative

Derivado halogenado

Halon (trade name given to halogenated hydrocarbons)

Halón

Heat balance (balance of the gains and losses of heat at a given place or for a given system)

Equilibrio térmico

Heat flux

Flujo térmico

Helsinki Declaration on the Protection of the Ozone Layer

Declaración de Helsinki sobre la protección de la capa de ozono

Helsinki meeting; First Meeting of the Parties to the Montreal Protocol on Substances that deplete the Ozone Layer

Reunión de Helsinki; primera reunión de las partes en el Protocolo de Montreal relativo a las sustancias agotadoras de la capa de ozono

Hemispherical distribution

Distribución hemisférica

Hexachlorobenzene, HCB	Hexaclorobenceno, HCB
Hexachlorocyclohexane, HCH	Hexaclorociclohexano, HCH
HFC, hydrofluorocarbon (potential substitute for the controlled substances which have no ozone depleting potentials but some greenhouse warming potential)	HFC, hidrofluorocarbono
High environmental risk area	Zona de alto riesgo ambiental
High latitudes (near North or South pole)	Latitudes elevadas
Hydrocarbon, HC	Hidrocarburo, HC
Hydrochlorofluorocarbon, HCFC (potential substitute for CFCs)	Hidroclorofluorocarbono, HCFC
Hydrofluorocarbon, HFC (potential substitute for CFCs)	Hidrofluorocarbono
Hydrological cycle; water cycle (the succession of stages through which water passes from the atmosphere to the ground surface and back)	Ciclo hidrológico
Hydrosphere (the part of the earth comprising water, e.g. oceans, lakes, rivers and underground waters)	Hidrosfera
Ice cap; ice sheet	Casquete glaciar; casquete polar
Ice core (sample of ancient ice sheets extracted for chemical-physical analysis)	Núcleo de hielo
Ice pack ; pack ice ; Arctic ice pack	Hielo a la deriva
Ice sheet	Banco de hielo
Implementation Committee (Ad Hoc Working Group of Legal Experts on Noncompliance with the Montreal Protocol)	Comité de Aplicación

INFOCLIMA. World Climate Data Information Referral Service (WMO) (referral information on climate data sources, data sets, station networks and station histories)	INFOCLIMA
INFOTERRA. International Environment Information System	INFOTERRA
INFOTERRA National focal point, NFP	Centro nacional de coordinación de INFOTERRA
Infrared absorbing gas	Gas que absorbe rayos infrarrojos
Integrated Global Ocean Services System, IGOSS (WMO/IOC)	Sistema Global Integrado de Servicios Oceánicos, SGISO
Intercomparison of Radiative Codes in Climate Models, ICRCCM (WMO/US Department of Energy/IAMAP Programme)	Programa de comparación de las claves de medida de la radiación utilizadas en los modelos climáticos
Intergovernmental Intersessional Preparatory Committee on the Environmental Perspective to the Year 2000 and Beyond (UNEP)	Comité Intergubernamental Preparatorio entre períodos de sesiones sobre la Perspectiva Ambiental hasta el año 2000 y Más Adelante
Intergovernmental Panel on Climate Change, IPCC (WMO/UNEP)	Grupo Intergubernamental de Expertos sobre Cambios Climáticos, IPCC
International Association of Meteorology and Atmospheric Physics, IAMAP (ICSU)	Asociación Internacional de Meteorología y Física Atmosférica, AIMFA
International Council of Environmental Law, ICEL	Consejo Internacional sobre el Derecho del Medio Ambiente
International Council of Scientific Unions, ICSU	Consejo Internacional de Uniones Científicas, CIUC
International Data Rescue Co-ordination Centre, IDRCC	Centro Internacional de Coordinación de Rescate de Datos
International Environment Information System, INFOTERRA (sponsored by UNEP; a decentralized database created in 1978, linking 136 countries)	Sistema Internacional de Información Ambiental, INFOTERRA

International Geophysical Year, IGY	Año Geofísico Internacional
International Geosphere-Biosphere Programme, IGBP (ICSU)	Programa Internacional Geosfera-Biosfera, PIGB
International Ozone Commission (WMO)	Comisión Internacional del Ozono
International Register of Potentially Toxic Chemicals, IRPTC (UNEP)	Registro Internacional de Productos Químicos Potencialmente Tóxicos
International Satellite Cloud Climatology Project, ISCCP (WMO World Climate research Programme)	Proyecto Internacional de climatología de nubes por satélites, ISCCP
International Union for the Conservation of Nature and Natural resources, IUCN, World Conservation Union	Unión Internacional para la Conservación de la Naturaleza y sus Recursos
Ionosphere (ionized region of the upper atmosphere)	Ionosfera
Isoprene	Isopreno
Joint Scientific Committee, JSC (WMO/ICSU)	Comité Científico Mixto OMM/CIUC, CCM
Ketones (family of organic compounds)	Cetonas
Kuroshio (planetary jet which originates in the low latitude areas)	Kuroshio
Land clearance	Desmonte
Light detection and ranging, LIDAR	Detección y localización por la luz
Line of latitude	Paralelo terrestre
Line of longitude	Meridiano
Litosphere (the outermost layer of the Earth)	Litosfera
London Conference on Saving the Ozone Layer	Conferencia de Londres sobre la protección de la capa de de ozono

Long-term Plan for the World Climate Programme
(WMO)

Plan a largo plazo para el Programa Mundial sobre
el Clima

Low latitudes (latitudes near de equator)

Latitudes bajas

Lower atmosphere

Atmósfera inferior

Lower stratosphere

Baja estratosfera

Marine biota

Biota marina

Medium-range forecast

Predicción meteorológica a mediano plazo

Melanoma skin cancer

Cáncer de piel con melanoma

Mesosphere (region of the atmosphere from top of
stratosphere to an altitude of about 50 miles)

Mesosfera

Methane, CH₄

Metano

Methyl bromide, CH₃ Br

Bromuro de metilo

Methyl chloride, CH₃ Cl

Cloruro de metilo

Methyl chloroform, CH₃ CCl₃, C₂ H₃ Cl₃

Metilcloroformo

Methyl mercaptan

Metilmercaptano

Mid-latitudes

Latitudes medias

Middle stratosphere

Estratosfera central

Modelling of climate change

Modelar el cambio climático

Montreal Protocol on Substances that Deplete the Ozone Layer	Protocolo (de Montreal) relativo a las Sustancias que Agotan la Capa de Ozono
Mountain glacier	Glaciar
National Oceanic and Atmospheric Administration, NOAA (USA)	Administración Nacional del Océano y de la Atmósfera
Nitrate nitrogen	Nitrógeno en forma de nitrato
Nitrate run-offs	Escorrentías que contienen nitratos
Nitrogen compound	Compuesto de nitrógeno
Nitrogen dioxide, NO ₂	Dióxido de nitrógeno
Nitrogen fertilizer	Fertilizante nitrogenado
Nitrogen oxides, No _x (oxides formed and released in all common types of combustion at high temperatures)	Oxidos de nitrógeno
Nitrogen Oxides Protocol to the Convention on Long-range Transboundary Air Pollution (UN-ECE)	Protocolo del Convenio sobre la contaminación Atmosférica transfronteriza a larga distancia, relativo a los óxidos de nitrógeno
Nitrous oxide, N ₂ O	Oxido nitroso
Non-fully halogenated CFCs; partially halogenated CFCs	CFC no plenamente halogenados; CFC parcialmente halogenados
Non-melanoma skin cancer	Cáncer de piel no melanoma
Non-methane hydrocarbon, NMHC	Hidrocarburo que no contiene metano
Northern middle latitudes	Latitudes septentrionales medias
Numerical Modelling Centre	Centro de modelización numérica

Numerical weather prediction, NWP; numerical forecast	Predicción meteorológica numérica, PMN
Observing ship station	Estación situada a bordo de un buque de observación
Ocean weather station; ocean station vessel; weather ship	Estación meteorológica oceánica
Ocean-atmosphere interaction	Interacción océano atmósfera
Open-ended Working Group of the Parties to the Montreal Protocol (UNEP)	Grupo de Trabajo de composición abierta de las Partes en el protocolo de Montreal
Optical depth; optical thickness	Profundidad óptica
Organizing Committee (Second World Climate Conference)	Comité organizador (de la Segunda Conferencia Mundial sobre el Clima)
Outgoing (low-wave) radiation	Radiación saliente
<i>Ozone Data for the World</i> (bimonthly bulletin published by the World Ozone Data Centre)	<i>Datos mundiales sobre el Ozono</i>
Ozone depleting potential, ODP	Potencial de agotamiento del ozono, PAO
Ozone depleting substance	Sustancia que agota la capa de ozono
Ozone depletion	Agotamiento de la capa de ozono; reducción del ozono
Ozone hole	Agujero de ozono
Ozone layer; Ozonosphere (layer of atmospheric ozone above the planetary boundary layer)	Capa de ozono; ozonósfera
Ozone modifying substance	Sustancia modificadora del ozono
Ozone monitoring	Vigilancia del ozono

Ozone, O₃ (produced mainly in the higher reaches of the atmosphere from ordinary oxygen as a result of the absorption of ultra-violet radiation)

Ozono

Ozone Project (WMO)	Proyecto (de la OMM) sobre el ozono
Ozone sink	Sumidero; pozo de ozono
Ozone sounding station	Estación de sondeo del ozono
Ozone station	Estación ozonométrica; estación de medida del ozono
Ozonosphere; ozone layer	Ozonosfera; capa de ozono
ppbv, parts per billion by volume	ppmmv, partes por mil millones en volumen
ppm, parts per million	ppm, partes por millón
ppmv, parts per million by volume	ppmv, partes por millón en volumen
pptvs, parts per trillion by volume	ppbv, partes por billón en volumen
Paleoclimatology	Paleoclimatología
Panel for Economic Assessment (established in accordance with article 6 of the Montreal Protocol)	Grupo de evaluación económica
Panel for Environmental Assessment (established in accordance with article 6 of the Montreal Protocol)	Grupo de evaluación ambiental
Panel for Scientific Assessment (established in accordance with article 6 of the Montreal Protocol)	Grupo de evaluación científica
Panel for Technical Assessment (established in accordance with article 6 of the Montreal Protocol)	Grupo de evaluación técnica
Partially halogenated CFCs; non-fully halogenated CFCs	CFC parcialmente halogenado

Particulate matter	Partículas
Pedosphere	Pedósfera
Perhalogenated; fully halogenated	Perhalogenado; totalmente halogenado
Permafrost	Tierras perennigélidas
Phase out (of CFCs)	Supresión progresiva; eliminación (de los CFCs)
Phasedown (of CFCs)	Reducción progresiva (de los CFCs)
Photochemical smog (produced by the combination of nitrogen oxides with hydrocarbons and free atmospheric oxygen under the influence of sunlight)	Niebla fotoquímica
Photochemistry	Fotoquímica
Photodegradation	Fotodegradación
Photosynthesis	Fotosíntesis
Plan of Action to combat Desertification	Plan de Acción para combatir la desertificación
Planetary boundary layer, PBL	Capa limítrofe del planeta
Plankton multiplier	Multiplicador de plancton
Polar stratospheric cloud, PSC	Nube estratosférica polar
Polar vortex; circumpolar vortex	Vórtice polar
Pollutant (any substance that adversely affects the quality of a resource)	Contaminante
"Polluter Pays Principle". PPP	Principio de que quien contamina paga

Pollution control technology	Tecnología de control de la contaminación
Polybrominated biphenyl, PBB	Bifenilo polibromato BPB
Polychlorinated biphenyl, PCB	Bifenilo policlorado, BPC
Polychlorinated terphenyl, PCT	Terfenilo policlorado TPC
Polychromatic radiation	Radiación policromática
Polynya (an area of open water surrounded by ice)	Polinia
Programme on Greenhouse Gases (WCRP project)	Programa relativo a los gases que tienen efecto de invernadero
Propellant (of an aerosol)	Propulsor (de bomba de aerosol)
Protocol on Chlorofluorocarbons (to the Vienna Convention for the Protection of the Ozone Layer)	Protocolo relativo a los clorofluorcarbonos
Radiation balance; net radiation	Balance de radiación
Radiative effects	Efectos radiativos
Radionuclide	Radionucleido
Radon	Radón
Rate of (ozone layer depletion)	Ritmo de agotamiento (de la capa de ozono)
Recovery (of controlled substances)	Recuperación (de sustancias controladas)
Recycling (of controlled substances)	Reciclaje (de sustancias controladas)
Reference climatological station	Estación climatológica de referencia
Run-off	Escoorrentía

Salinity profile	Perfil de sanidad
Salinization	Salinización
Satellite sensor	Detector instalado en satélite
Scientific Advisory Committee for the World Climate Impact Study Programme, SAC (UNEP)	Comité Consultivo Científico para el Programa Mundial de Estudios del Impacto del Clima
Scientific Committee on Problems of the Environment, SCOPE (ICSU)	Comité Científico sobre Problemas del Medio Ambiente, SCOPE
Sea Ice (part of the cryosphere)	Hielo Marino
Sea-level rise	Aumento del nivel del mar
Second World Climate Conference, SWCC	Segunda conferencia Mundial sobre el clima
Semi-arid tropics	Regiones tropicales semiáridas
Sensor	Detector
Solar backscatter ultraviolet instrument, SBUV	Sensor de la retrodispersión ultravioleta solar
Solar constant	Constante solar
Solar Energy Meeting (WMO, October 1978)	Reunión sobre energía solar
Solar spectral flux	Flujo espectral solar
Source gases	Gases primarios
Southern Oscillation	Oscilación meridional
Special Committee on Global Change (ICSU)	Comité Especial sobre los cambios a nivel mundial

Special Fund for Climate and Atmospheric
Environmental Studies (WMO)

Fondo Especial para los Estudios sobre el Clima y
el Medio Ambiente Atmosférico

Spectrometer

Espectómetro

Spectroscopic data

Datos espectroscópicos

Spray-can propellant

Propulsor de bomba de aerosol

Spring ozone hole in the Antarctic

Agujero de ozono observado en primavera sobre el
Antártico

Statement on modification of the ozone layer due to
human activities

Declaración sobre la modificación de la capa de
ozono causada por las actividades humanas

Storm surge

Marea tormentosa; mar de leva

Stratosphere (layer of stratospheric air above the
troposphere)

Estratósfera

Sub-tropics

Regiones subtropicales

Substance listed in Annex A to the Montreal Protocol

Sustancia enumerada en el Anexo del Protocolo de
Montreal

Substitute product

Producto sustitutivo

Sulphur deposition

Depósito de azufre

Sulphur dioxide, SO₂

Anhídrido sulfuroso; dióxido de azufre

Sulphur oxides, SO_x (oxides coming mainly from the
combustion of fossil fuels containing sulphur)

Oxidos sulfurados

Sulphuric acid, H₂SO₄

Acido sulfúrico

Sulphurous acid, H₂SO₃ (produced by the reaction of
sulphur dioxide with water vapour in the air)

Acido sulfuroso

Sunspot	Mancha solar
Surface albedo (governs the fraction of solar radiation converted to surface heating)	Albedo de superficie
Surface ozone	Ozono de superficie
Surface Radiation Budget Climatology Project (WCRP)	Proyecto sobre Climatología del balance de la radiación de superficie
Suspended particulate matter, SPM	Partículas en suspensión
Synoptic station	Estación sinóptica
System-wide medium-term environment programme (UNEP)	Programa de mediano plazo para el medio ambiente a nivel de todo el sistema
Technical regulations (WMO)	Reglamento técnico
Temperate zone	Zona templada
Terpenes (group of hydrocarbons)	Terpenos
Terrestrial biota (life found on land)	Biota terrestre
Thermocline (a layer of water in which temperature declines abruptly with depth)	Termoclina
Thermodynamic model of climate	Modelo termodinámico del clima
Thermosphere (region of atmosphere beyond the mesosphere)	Termosfera
Thinning (of the ozone layer)	Disminución (de la capa de ozono)
Threshold limit value, TLV (the maximum concentration of air polluting substances in the free environment whose impact is not objectionable to man, fauna and flora)	Concentración máxima admisible

Tornado	Tornado
Total ozone mapping spectrometer, TOMS	Espectrómetro para la cartografía del total de ozono, TOMS
Trace gas	Gas en baja concentración
Transitional substances	Sustancias de transición
Tree-ring data (in dendrochronology, indicative bio-data for comparison and determination of climate trends)	Datos dendrocronológicos
Trichlorofluoromethane, CFC 11	Triclorofluorometano
Trichlorotrifluoroethane, CFC 113	Triclorotrifluoroetano
Tritium	Tritio
Tropical Cyclone Programme, TCP (WMO)	Programa sobre los ciclones tropicales, PCT
Tropical Ocean and Global Atmosphere Programme, (WCRP)	Programa de estudio de los océanos tropicales y de la atmósfera del globo, TOGA
Tropics	Regiones tropicales
Tropopause (interface between troposphere and stratosphere)	Tropopausa
Troposphere (layer of atmospheric air extending about seven miles upwards from earth's surface)	Troposfera
Tropospheric ozone	Ozono troposférico
Trust Fund for the Vienna Convention for the Protection of the Ozone Layer	Fondo Fideciario para el Convenio de Viena para la Protección de la Capa de Ozono

Ultraviolet A radiation, UVA	Radiación ultravioleta A, UV-A
Ultraviolet B radiation, UVB, (solar ultraviolet radiation having biological effects)	Radiación ultravioleta B, UV-B
Ultraviolet C radiation, UVC	Radiación ultravioleta C, UV-C
United Nations Conference on Environment and Development (also referred to as: Second World Conference on Environment and development)	Conferencia de las Naciones Unidas sobre el Medio Ambiente y el Desarrollo
United Nations Conference on the Human Environment (Stockholm, 1972)	Conferencia de las Naciones Unidas sobre el Medio Humano
United Nations Environment Programme (UNEP)	Programa de las Naciones Unidas para el Medio Ambiente (PNUMA)
United Nations Water Conference	Conferencia de las Naciones Unidas sobre el Agua
Upper mid-latitudes; northern middle latitudes	Latitudes septentrionales medias
Upper stratosphere	Estratosfera superior
Upper troposphere	Troposfera superior
Upper-air data	Datos de observación de la atmósfera superior
Upwelling	Corriente ascendente
Vertical distribution (of ozone)	Repartición vertical (del ozono)
Vertical profile (of a meteorological element)	Perfil vertical
Volatile organic compound, VOC	Compuesto orgánico volátil
Voluntary Co-operation Programme, VCP (WMO)	Programa de Cooperación Voluntaria, PCV
Vortex	Vórtice, torbellino

Warming	Calentamiento
Wave and tide theory	teoría de olas y mareas
Wavelength-resolved solar flux	Flujo solar analizado por longitud de onda
Weather forecasting	Predicción meteorológica
Weather patterns	Características meteorológicas
Windborne	Eólico
Working Group of Experts on Environmental Law (UNEP)	Grupo de trabajo de expertos en derecho ambiental
Working Group on Climate Data Management (WMO)	Grupo de trabajo sobre gestión de datos climáticos
Working Group on Impacts (IPCC)	Grupo de trabajo sobre impactos
Working Group on Numerical Experimentation, WGNE (WMO)	Grupo de trabajo sobre experimentación numérica
Working Group on Policy (IPCC)	Grupo de trabajo sobre política
Working Group on Science (IPCC)	Grupo de trabajo sobre ciencia
World Area Forecast System, WAFS (WMO)	Sistema mundial de pronóstico de área, WAFS
World Charter for Nature	Carta Mundial de la Naturaleza
World Climate Applications Programme, WCAP (one of the four components of the WMO/WCP)	Programa mundial de aplicaciones climáticas, PMAC
World Climate Conference, WCC; First World Climate Conference (WMO-sponsored)	Conferencia Mundial sobre el Clima

World Climate Data Programme, WCDP (one of the four components of the WMO/WCP)	Programa mundial de datos climáticos
World Climate Impact Studies Programme, WCIP (one of the four components of the WMO/WCP)	Programa mundial de estudios del impacto del clima, P MEC
World Climate Programme, WCP	Programa mundial sobre el clima, PMC
World Climate Research Programme, WCRP	Programa mundial de investigaciones climáticas, PMIC
World Commission on Environment and Development, WCED	Comisión Mundial sobre el Medio Ambiente y el Desarrollo
World Conference on the Changing Atmosphere: Implications for Global Security (organized by the Government of Canada and co-sponsored by UNEP and WMO)	Conferencia mundial sobre los cambios atmosféricos: consecuencias para la seguridad mundial
World Conservation Strategy, WCS (IUCN, UNEP, WWF)	Estrategia Mundial para la Conservación
World Environment Day (5 June)	Día Mundial del Medio Ambiente
World Meteorological Congress (WMO)	Congreso meteorológico mundial
World Ocean Circulation Experiment, WOCE (WCRP)	Experimento mundial sobre la circulación oceánica, WOCE
World Ozone Data Centre, WODC (operated by Canada on behalf of WMO)	Centro mundial de datos sobre ozono
World Ozone Network	Red mundial de medida del ozono
World Plan of Action on the Ozone Layer (UNEP)	Plan mundial de acción sobre la capa de ozono
World Radiation Network (WMO)	Red radiométrica mundial
World Weather Watch, WWW	Vigilancia meteorológica mundial, VMM
Worldwatch Institute (USA)	Instituto de la Vigilancia Mundial

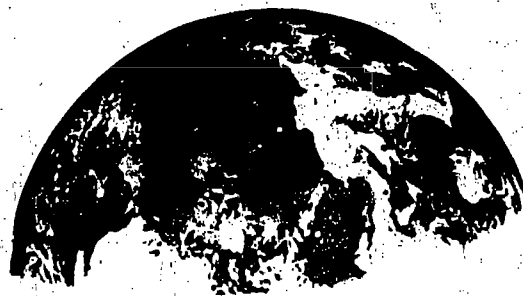
LIST OF ENGLISH ABBREVIATIONS

ACC	Administrative Committee on Co-ordination
AGOG	Advisory Group on Greenhouse Gases
BAPMoN	Background Air Pollution Monitoring Network
CARS	Climate Applications Referral System
CCI	Commission for Climatology
CCOL	Co-ordinating Committee on the Ozone Layer
CFC	chlorofluorocarbon
CFM	chlorofluoromethane
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO	carbon monoxide
CSM	Climate System Monitoring
DARE	Data Rescue
DOEM	Designated Officials for Environmental Matters
EIA	environmental impact assessment
EMEP	Co-operative Programme for the Monitoring and Evaluation of the Long-range
GARP	Global Atmospheric Research Programme
GAW	Global Atmosphere Watch
GEMS	Global Environmental Monitoring System
GHG	greenhouse gas
GHP	greenhouse warming potential
GMCC	Geophysical Monitoring for Climate Change
GRID	Global Resource Information Database
GWP	global warming potential
HC	hydrocarbon
HCB	hexachlorobenzene
HCFC	hydrochlorofluorocarbon
HCH	hexachlorocyclohexane

HFC	hydrofluorocarbon
IAMAP	International Association of Meteorology and Atmospheric Physics
ICEL	International Council of Environmental Law
ICRCCM	Intercomparison of Radiative Codes in Climate Models
ICSU	International Council of Scientific Unions
IDRCC	International Data Rescue Co-ordination Centre
IGBP	International Geosphere-Biosphere Programme
IGOSS	Integrated Global Ocean Services System
IGY	International Geophysical Year
INFOTERRA	International Environment Information System
IOC	Intergovernmental Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
IRPTC	International Register of Potentially Toxic Chemicals
ISCCP	International Satellite Cloud Climatology Project
IUCN	International Union for the Conservation of Nature and Natural Resources
JSC	Joint Scientific Committee
LIDAR	light detection and ranging
NFP	INFOTERRA national focal point
NOAA	National Oceanic and Atmospheric Administration
NMHC	non-methane hydrocarbon
NWP	numerical weather prediction
ODP	ozone depleting potential
PBB	polybrominated biphenyl
PBL	planetary boundary layer
PCB	polychlorinated biphenyl
PCT	polychlorinated terphenyl
PPP	Polluter Pays Principle
PSC	polar stratospheric cloud
SAC	Scientific Advisory Committee for the World Climate Impact Studies Programme

SBUV	solar backscatter ultraviolet instrument
SCOPE	Scientific Committee on Problems of the Environment
SPM	suspended particulate matter
SWCC	Second World Climate Conference
TCP	Tropical Cyclone Programme
TLV	threshold limit value
TOGA	Tropical Oceans and Global Atmosphere Programme
TOMS	Total Ozone Mapping Spectrometer
UN-ECE	United Nations - Economic Commission for Europe
UNEP	United Nations Environment Programme
UVA	ultraviolet A radiation
UVB	ultraviolet B radiation
UVC	ultraviolet C radiation
VAP	Voluntary Assistance Programme
VCP	Voluntary Co-operation Programme
VOC	volatile organic compound
WAFS	World Area Forecast System
WCAP	World Climate Applications Programme
WCC	World Climate Conference
WCDP	World Climate Data Programme
WCED	World Commission on Environment and Development
WCIP	World Climate Impact Studies Programme
WCP	World Climate Programme
WCRP	World Climate Research Programme
WCS	World Conservation Strategy
WGNE	Working Group on Numerical Experimentation
WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment

WODC	World Ozone Data Centre
WWF	World Wide Fund for Nature
WWW	World Weather Watch



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