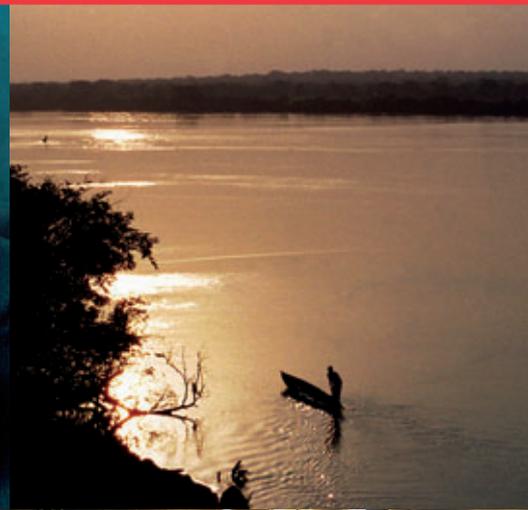
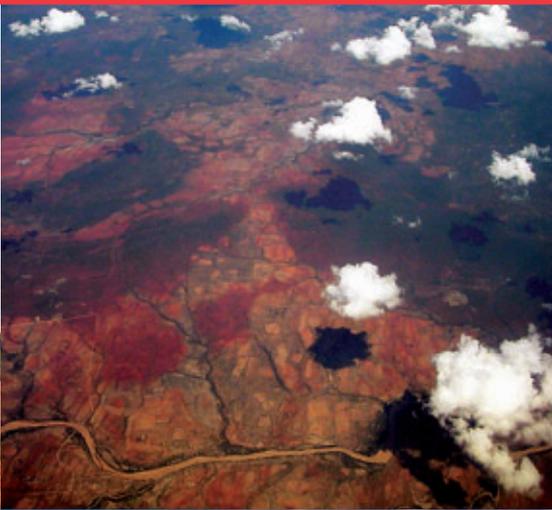
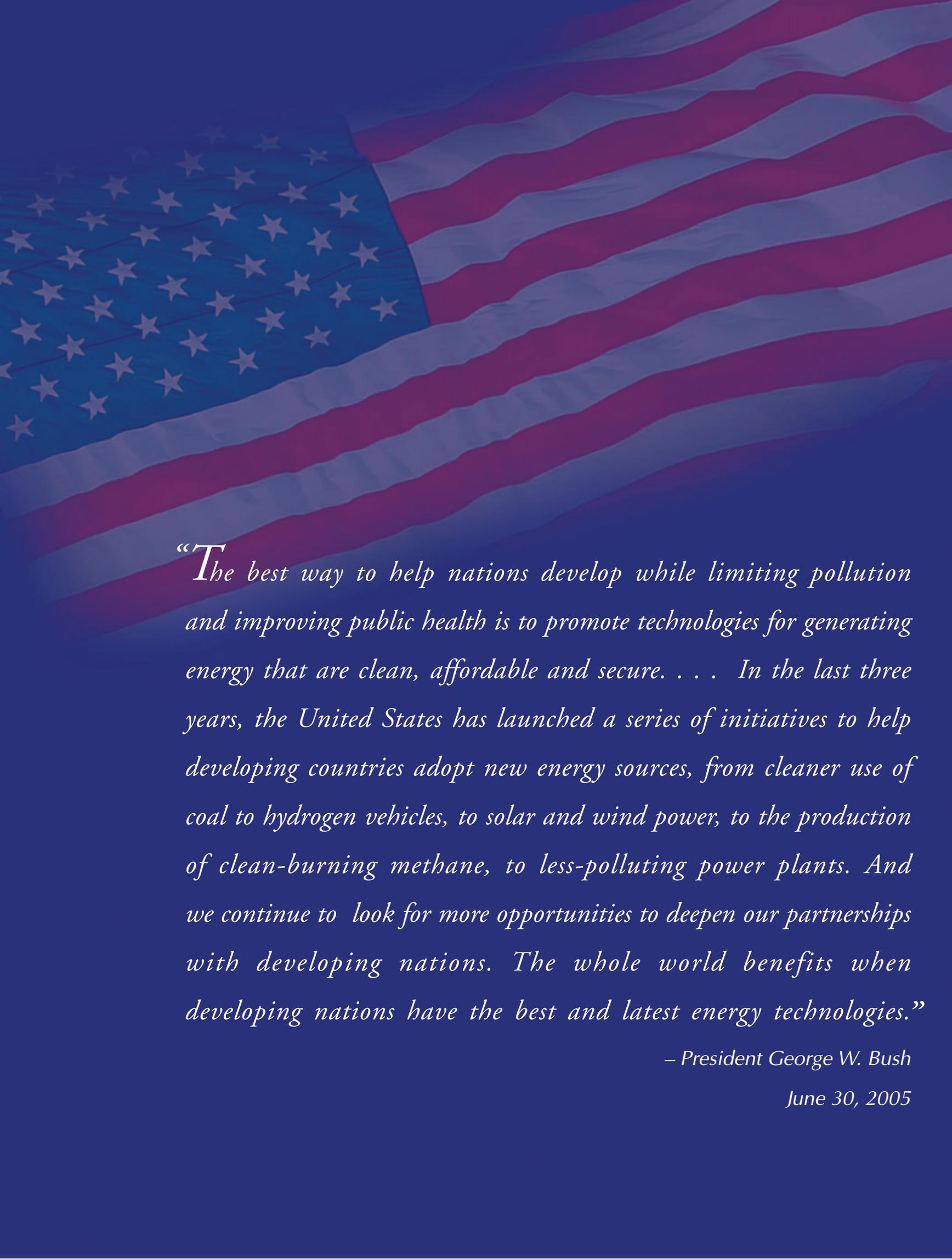


USA

Energy Needs, Clean Development and Climate Change



Partnerships in Action



“The best way to help nations develop while limiting pollution and improving public health is to promote technologies for generating energy that are clean, affordable and secure. . . . In the last three years, the United States has launched a series of initiatives to help developing countries adopt new energy sources, from cleaner use of coal to hydrogen vehicles, to solar and wind power, to the production of clean-burning methane, to less-polluting power plants. And we continue to look for more opportunities to deepen our partnerships with developing nations. The whole world benefits when developing nations have the best and latest energy technologies.”

– President George W. Bush

June 30, 2005

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I. Overview

The international community has spoken with a clear and unified voice; effective actions to meet energy needs, advance clean development, and address climate change require integrated solutions that achieve sustainable development. The United States and our partners around the world are moving forward on a multitude of local, regional and global energy, clean development and climate change initiatives that support the broader goals of promoting economic growth, meeting the need for greater energy resources for poverty eradication, enhancing social conditions and protecting the environment.



The earth rises over the moon.

Source: Courtesy of NASA

World leaders set forth a framework for this comprehensive approach at the World Summit on Sustainable Development in 2002. At Gleneagles, in July 2005, G8 leaders met and pledged: “We will act with resolve and urgency now to meet our shared and multiple objectives of reducing greenhouse gas emissions, improving the global environment, enhancing energy security and cutting air pollution in conjunction with our vigorous efforts to reduce poverty.”

At Vientiane in July 2005, ministers from countries representing over half of the world's economy, population, energy use and greenhouse gas emissions announced the creation of the Asia-Pacific Partnership on Clean Development and Climate. They noted “development and poverty eradication are urgent and overriding goals,” and committed to “enhance cooperation to meet both our increased energy needs and associated challenges, including those related to air pollution, energy security, and greenhouse gas intensities.”

Energy needs, clean development and climate change are complex, long-term challenges that require sustained commitment and focus on the part of all nations. Together with our partners around the world, the United States is accelerating efforts to develop cleaner and more efficient energy technologies as a means to improve economic and energy security, reduce harmful air and water pollution, and reduce the greenhouse gas intensity of the global economy.

The United States has established a robust and flexible climate change policy that harnesses the power of markets and technological innovation, maintains economic growth, and encourages global participation. Major elements of the U.S. approach include implementing near-term policies and measures to slow the growth in greenhouse gas emissions, investing in climate change science, accelerating technology development, and promoting international collaboration.

The United States is working in partnership with other governments, non-governmental organizations, and the private sector to transform the way that energy is produced and consumed in ways that will improve the lives of billions of people. Our approach draws upon the best scientific research, fosters the creativity of entrepreneurs, and works with the developing world to meet our shared aspirations for our people, our economy, and our environment.

II. Domestic Actions and Public/Private Partnerships to Slow the Near-Term Growth of Greenhouse Gas Emissions



Mountains appear through the clouds in Utah. Domestic actions and Public/Private partnerships are leading to many positive impacts, including the protection of America's natural heritage. Source: Courtesy of DOE

A. Greenhouse Gas Intensity Goal

In February 2002, President Bush committed the United States to cut its greenhouse gas intensity — the amount emitted per unit of economic activity — by 18 percent by 2012, to set America on a path to slow the growth of its greenhouse gas emissions and, as science justifies, to stop and then reverse that growth. A hallmark of the intensity approach is flexibility, an especially important consideration when confronted with the many uncertainties surrounding climate change. These uncertainties suggest that a measured response is required that concentrates first on slowing emissions growth before trying to stop and eventually reverse it. A greenhouse gas emissions intensity goal can encourage reductions without risking economic consequences that could jeopardize our ability to invest in long-term scientific and technological solutions. The Administration estimates that its 18 percent intensity improvement goal will reduce cumulative emissions of carbon dioxide by more than 1,833 million metric tons by 2012, and recent Energy Information Administration projections suggest that achieving the 18 percent goal will reduce carbon dioxide emissions by 366 million metric tons in 2012 alone.

B. Climate VISION (Voluntary Innovative Sector Initiatives: Opportunities Now)

President Bush launched ClimateVISION in February 2003, when he announced that 12 major industrial sectors and The Business Roundtable have committed to work with four of his cabinet agencies (the Departments of Energy, Transportation, and Agriculture and the Environmental Protection Agency) to reduce greenhouse gas emissions intensity of their

operations in the next decade. The participating organizations, which now number 15, account for approximately 40 to 45 percent of total U.S. greenhouse gas emissions and include: electric utilities; petroleum refiners and natural-gas producers;



Source: Courtesy of DOE

ClimateVision logo.

automobile, iron and steel, chemical and magnesium manufacturers; forest and paper producers; railroads; and the cement, mining, aluminum, lime, minerals, and semiconductor industries. To read the President's statement, please visit:

www.whitehouse.gov/news/releases/2003/02/20030212.html.

For more information, please visit www.climatevision.gov.

C. Climate Leaders

Climate Leaders is an Environmental Protection Agency (EPA) partnership encouraging individual companies to develop long-term, comprehensive climate change strategies. Under this program, partners set corporate-wide greenhouse-gas reduction goals and inventory their emissions to measure progress. Since 2002, Climate



Source: Courtesy of Powerlight Corporation (2003)

Janssen Pharmaceutica, a subsidiary of Johnson & Johnson Inc., installed a 500 KW rooftop solar energy system in 2003 as part of the company's corporate-wide greenhouse gas reduction strategy. Through EPA's Climate Leaders Program, Johnson & Johnson has pledged to reduce its total U.S. greenhouse gas (GHG) emissions by 14 percent from 2001 to 2010.

Leaders has grown to include 70 corporations whose U.S. emissions represent eight percent of total U.S. greenhouse gas emissions. More than half of those corporations have committed to greenhouse-gas reduction goals. For more information and a list of Climate Leaders partners, please visit www.epa.gov/climateleaders.

D. SmartWay Transport Partnership

Launched in February 2004, the SmartWay Transport Partnership is designed to reduce fuel consumption and emissions, and improve energy security by encouraging shippers and carriers to improve the overall environmental performance of the freight delivery system. Currently, 225 companies have joined SmartWay, including 170 Trucking Carriers, 25 Shippers, seven Shippers and Carriers, eight Railroads, seven logistics companies, and three Affiliates. By 2012, this initiative aims to eliminate 33 to 66 million metric tons of carbon dioxide emissions and up to 200,000 tons of nitrogen oxides emissions per year. At the same time, the initiative will result in fuel savings of up to 150 million barrels of oil annually. For more information, please visit www.epa.gov/otaq/smartway/index.htm.



The Petro Travel Center in Knoxville, TN provides advanced truck stop electrification, limiting emissions from trucks.

Source: Courtesy of Powerlight Corporation (2003)

E. ENERGY STAR®

Recognizing the importance of energy efficiency, EPA reestablished the voluntary ENERGY STAR® program in 1992, and has partnered with the Department of Energy (DOE) since 1996 to increase the nationwide use of energy-efficient products and practices. Through the ENERGY STAR program, consumers have benefited from the purchase of more than 1.5 billion ENERGY STAR qualified products, including home appliances, heating and cooling equipment, home electronics, office equipment, lighting, and other products. In addition, more than 360,000 families now live in ENERGY STAR qualified new homes and have locked in total financial savings estimated at \$200 million annually. In 2004 alone, Americans, with



Source: Courtesy of EPA

Energy Star logo.

the help of ENERGY STAR, prevented 30 million metric tons of greenhouse gas emissions—equivalent to the annual emissions from 20 million vehicles—and saved about \$10 billion on their utility bills. For more information, please visit <http://www.energystar.gov/>.

F. Targeted Incentives for Greenhouse Gas Sequestration

In June 2003, the Secretary of Agriculture announced that, for the first time, the U.S. Department of Agriculture (USDA) would provide targeted incentives to encourage wider use of land management practices that remove carbon dioxide from the atmosphere or reduce



USDA programs encourage farmers to expand conservation tillage, plant trees, and restore riparian systems.

Source: Courtesy of USDA/NRCS

emissions of greenhouse gases. Through USDA's forest and agriculture conservation programs, such as the Environmental Quality Incentives Program and Conservation Reserve Program, USDA is encouraging the increased use of biomass energy, crop and grazing land conservation actions, practices to reduce emissions from agriculture, and sustainable forest management. For more information, please visit www.usda.gov/oce/gcpc/gcpcnews.htm.

G. Fuel Economy Increase for Light Trucks

On April 1, 2003, the Bush Administration finalized regulations requiring an increase in the fuel economy of light trucks for Model Years 2005 to 2007, the first such increase since 1996. The increase from 20.7 miles per gallon to 22.2 miles per gallon by 2007 more than doubles the increase in the standard that occurred between Model Years 1986 and 1996. The new increased fuel economy standards are expected to save approximately 3.5 billion gallons of gasoline over the lifetime of these trucks, with the corresponding avoidance of almost 9.5 million metric tons of carbon equivalent emissions. The Administration also proposed a new round of standards on August 23, 2005. The proposed Reformed standards from 2008-2011 model years for light trucks is expected to save 10 billion gallons of gasoline in the years to come, and will reduce lifetime GHG emissions by 37.4 million metric tons on a carbon-equivalent basis (MMTCe).

H. Energy Policy Act of 2005: Tax Incentives to Reduce Greenhouse Gas Emissions

The Energy Policy Act of 2005 includes over \$11.5 billion in tax incentives from 2005 to 2015. Many of these tax incentives will have significant greenhouse gas reduction benefits and are designed to spur investments in energy infrastructure, enhance domestic energy security, and promote deployment of conservation and energy efficiency technologies and alternative motor vehicles.

I. Presidential Budget

President Bush's fiscal year (FY) 2006 Budget proposes \$5.5 billion for climate-change programs and energy tax incentives, which is \$250 million (4.8 percent) more than FY 2005, as enacted. This figure includes nearly \$3 billion for the Climate Change Technology Program, nearly \$2 billion for the Climate Change Science Program, and \$200 million for climate-change-related international assistance programs. In addition, conservation programs funded by the 2002 Farm Bill may increase the removal of carbon dioxide from the atmosphere due to agricultural activities.



Source: Courtesy of the White House

President George W. Bush holds the signed version H.R. 6, The Energy Policy Act of 2005, at Sandia National Laboratory in Albuquerque, New Mexico on August 8, 2005.

III. Advancing Climate Change Science and Accelerating Climate Change Technology



Wind Turbines at Tehachapi, California. Source: Courtesy of DOE

A. Climate Change Science Program

The President established the U.S. Climate Change Science Program (CCSP) in 2002 as part of a new ministerial-level management structure to oversee public investments in climate change science and technology. The CCSP incorporates the U.S. Global Change Research Program, established by the Global Change Research Act, and the Climate Change Research Initiative, established by the President in 2001. The Program coordinates and integrates scientific research on global change and climate change sponsored by 13 participating departments and agencies of the U.S. Government. It is responsible for facilitating the development of a strategic approach to federally supported climate research, integrated across the participating agencies.

Its principal aims are to investigate natural and human-induced changes in the Earth's global environmental system, monitor important climate parameters, predict global change, and provide a sound scientific basis for national and international decision-making. In 2003, CCSP released its strategic plan for guiding climate



A NOAA employee services a buoy providing ocean observing data.

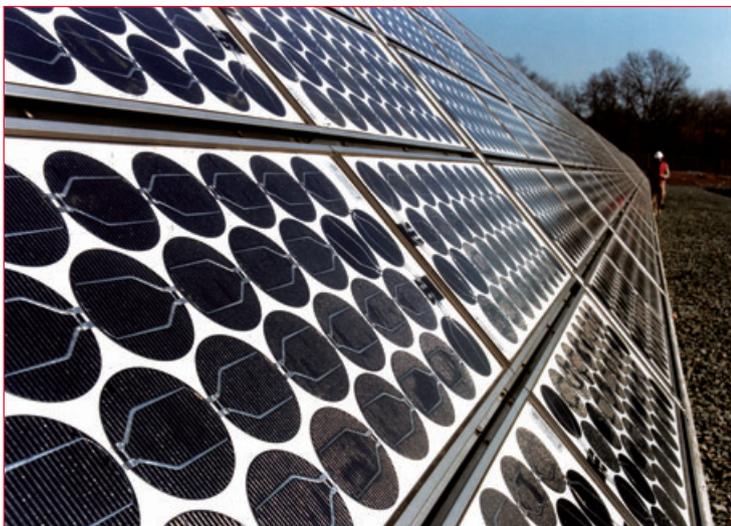
Source: Courtesy of NOAA

research. The plan is organized around five goals: (1) improving our knowledge of climate history and variability; (2) improving our ability to quantify factors that affect climate; (3) reducing uncertainty in climate projections; (4) improving our understanding of the sensitivity and adaptability of ecosystems and human systems to climate change; and (5) exploring options to manage risks.

Since CCSP was created in 2002, the program has successfully integrated a wide range of the research and climate science priorities of the 13 CCSP agencies. CCSP has taken on some of the most challenging questions in climate science and is developing products to convey the most advanced state of knowledge to be used by federal, state and local decision makers, resource managers, the science community, the media, and the general public.

Twenty-one Synthesis and Assessment Products are identified in the Strategic Plan to be produced through 2008. These reports are designed to address a full range of science questions and evaluate options for response that are of the greatest relevance to decision and policy makers and planners. The products are intended to provide the best possible state of science information, developed by a diverse group of climate experts, for the decision community.

CCSP held a public workshop on November 14-16, 2005, in Virginia to address the capability of climate science



A single-axis line-focus solar collector, which is an example of how DOE is participating in cost-sharing research to reduce operating and maintenance costs of solar thermal systems.

Source: Courtesy of DOE-NREL

to inform decision-making. The workshop also served as a forum to address the progress and future plans regarding CCSP's three decision-support deliverables as described above. The Workshop provided an opportunity for scientists and user communities to discuss decision-maker needs and future application of scientific information on climate variability and change, as well as discussion on expected outcomes of CCSP's research and assessment activities that are necessary for sound resource management, adaptive planning and policy. For more information, please visit www.climate-science.gov.

B. Climate Change Technology Program

The Climate Change Technology Program (CCTP) is the technology counterpart to CCSP and coordinates and prioritizes the Federal Government's climate-related technology research, development, demonstration, and deployment (RDD&D) activities. Title XVI of the Energy Policy Act of 2005 authorizes CCTP to be housed within the Department of Energy (DOE). On August 5, 2005, DOE released the CCTP Vision and Framework,

Using various analytical tools, CCTP is assessing different technology options and their potential contributions to reducing greenhouse gas emissions. Given the tremendous capital investment in existing energy systems, the desired transformation of our global energy system may take decades or more to implement fully. A robust RDD&D effort can make advanced technologies available sooner rather than later and can accelerate modernization of capital stock at lower cost and with greater flexibility.

Many climate technology activities build on existing work, but the Administration also has expanded and realigned some activities and launched new initiatives in strategic technology areas. For more information, please visit www.climate-technology.gov/.

1. Energy Efficiency and Renewable Energy

Energy efficiency is the single largest investment area under CCTP and it provides tremendous short-term potential to reduce energy use and greenhouse gas emissions. Renewable energy includes a range of different technologies that can play an important role in reducing greenhouse gas emissions. The United States invests significant resources in wind, solar photovoltaics, geothermal, and biomass technologies. Many of these technologies have made considerable progress in price competitiveness, but there remain opportunities to reduce manufacturing, operating, and maintenance costs of many of these technologies. For more information, please visit www.eere.energy.gov/.



Secretary of Energy, Samuel Wright Bodman, stands on top of a large wind turbine during a tour at the National Wind Technology Center near Boulder, Colorado.

Source: Courtesy of DOE



Prototype Hydrogen Fuel Cell Bus.

which provides basic guidance for the program. CCTP's strategic vision has six complementary goals: (1) reducing emissions from energy use and infrastructure; (2) reducing emissions from energy supply; (3) capturing and sequestering carbon dioxide; (4) reducing emissions of other greenhouse gases; (5) measuring and monitoring emissions; and (6) bolstering the contributions of basic science. DOE also released for public review and comment the larger CCTP Strategic Plan on September 22, 2005.



Source: Courtesy of DOE

The Pacific International Center for High Technology Research (PICHTR) operates this biomass gasification demonstration project located in Hawaii. This gasification plant will initially process bagasse from the neighboring sugarcane refineries, but is designed to receive a wide variety of biomass.

2. Hydrogen

President Bush launched the Hydrogen Fuel Initiative in his 2003 State of the Union Address. The goal is to work closely with the private sector to accelerate our transition to a hydrogen economy, on both the technology of hydrogen fuel cells and a fueling infrastructure. The President's Hydrogen Fuel Initiative and the FreedomCAR Partnership launched in 2002 will provide \$1.7 billion through 2008 to develop hydrogen-powered fuel cells, hydrogen production and infrastructure technologies, and advanced automotive technologies, allowing for commercialization of fuel-cell vehicles by 2020.



Source: Courtesy of DOE NREL

Hydrogen Flame.

Through its International Partnership for the Hydrogen Economy (see international section below), the United States is pursuing international cooperation to effect a more rapid, coordi-

nated advance for this technology that could lead to the reduction of air pollutants and a significant reduction of greenhouse gas emissions in the transportation sector worldwide. For more information on this initiative, please visit:

www.eere.energy.gov/hydrogenandfuelcells/presidents_initiative.html.

3. Carbon Sequestration

Carbon capture and sequestration is a central element of CCTP's strategy because for the foreseeable future, fossil fuels will continue to be the world's most reliable and lowest-cost form of energy. A realistic approach is to find ways to capture and store the carbon dioxide produced when these fuels are used. DOE's core Carbon Sequestration Program emphasizes technologies that capture carbon dioxide from large point sources and store it in geologic formations. In 2003, DOE launched a nationwide network of seven Regional Carbon Sequestration Partnerships, involving State agencies, universities, and the private sector, to determine the best approaches for sequestration in each geographic region represented and to examine regulatory and infrastructure needs. On June 9, 2005, Secretary of Energy Samuel Bodman announced that DOE will provide \$100 million to further develop carbon sequestration technologies used to capture and permanently store greenhouse gases, a major expansion of the Regional Partnerships program. For more information, please visit: www.fe.doe.gov/programs/sequestration/index.html.



Source: Courtesy of Petroleum Technology Research Centre

Aerial view of the Weyburn carbon sequestration project which is advancing knowledge of carbon sequestration technology.

4. Coal-Fired, Near-Zero-Emissions Power Generation

The United States has vast reserves of coal, and about half of its electricity is generated from this fuel. Advanced coal-based power and fuels, therefore, is an area of special interest from both an energy security and climate change perspective. The Coal Research Initiative (CRI) consists of research, development, and demonstration of coal-related technologies that will improve coal's competitiveness in future energy supply markets. The Clean Coal Power Initiative (CCPI), within the CRI, is a cost-shared program between the government and industry to demonstrate emerging technologies in coal-based power generation and to accelerate their commercialization. A major initiative under CCPI is the FutureGen project, a 10-year, \$1 billion government-industry cost-shared effort to design, build, and operate the world's first near-zero atmospheric emissions coal-fired power plant. This project, which cuts across many CCTP strategic areas, will incorporate the latest technologies in carbon sequestration, oxygen and hydrogen separation membranes, turbines, fuel cells, and coal-to-hydrogen gasification. Through the CRI, clean coal can remain part of a diverse, secure energy portfolio well into the future. For more information, please visit: www.fe.doe.gov/programs/powersystems/cleancoal/index.html and www.fe.doe.gov/programs/powersystems/futuregen/index.html.

5. Nuclear Fission

Concerns over resource availability, energy security, and air quality as well as climate change suggest a larger role for nuclear power as an energy supply

choice. While current generations of nuclear energy systems are adequate in many markets today, new construction of advanced light-water reactors in the near term and of even more advanced systems in the longer term can broaden opportunities for nuclear energy, both in industrialized and developing countries. The Nuclear Power 2010 program is working with industry to demonstrate the Nuclear Regulatory Commission's new licensing process, while the Generation IV Nuclear Energy Systems Initiative is investigating the more advanced reactor and fuel cycle systems that represent a significant leap in economic performance, safety, and proliferation-resistance. One promising system being developed under the Nuclear Hydrogen Initiative would pair very-high-temperature reactor technology with advanced hydrogen production capabilities that could produce both electricity and hydrogen on a scale to meet transportation needs. Complementing these programs is the Advanced Fuel Cycle Initiative, which is developing advanced, proliferation resistant nuclear fuel technologies that can improve the fuel cycle, reduce costs, and increase the safety of handling nuclear wastes. For more information, please visit:

www.ne.doe.gov/NucPwr2010/NucPwr2010.html, www.ne.doe.gov/infosheets/geni.pdf, www.ne.doe.gov/infosheets/hydrogen.pdf, and www.ne.doe.gov/infosheets/afci.pdf.

6. Nuclear Fusion

Fusion energy is a potential major new source of energy that, if successfully developed, could be used to produce electricity and possibly hydrogen. Fusion has features that make it an attractive option from both an environmental and safety perspective. However, the technical hurdles of fusion energy are very high, and with a commercialization objective of 2050, its impact would not be felt until the second half of the century, if at all. Nevertheless, the promise of fusion energy is simply too great to ignore. For more information, please visit www.sc.doe.gov/feature/fes.htm.



An artist's rendition of a coal fired zero-emission power plant.

Source: Courtesy of DOE

Provided by kd.lab + itl

IV. Clean Development Partnerships



Families in Guatemala stand by improved cook stoves being delivered to their village as part of a Partnership for Clean Indoor Air pilot project implemented by HELPS International and the Shell Foundation. The stoves will dramatically improve indoor air quality.
Source: Courtesy of EPA

A. Clean Energy Initiative

At the 2002 World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa, the United States launched a “Clean Energy Initiative,” whose mission is to bring together governments, international organizations, industry and civil society in partnerships to alleviate poverty and spur economic growth in the developing world by modernizing energy services. The Initiative consists of four market-oriented, performance-based partnerships. For more information on the Clean Energy Initiative, please visit www.sdp.gov/sdp/initiative/cei/44936.htm.

1. Global Village Energy Partnership (GVEP)

GVEP is an international partnership with over 700 public and private sector partners including the World Bank, the United Nations Development Programme, and leading energy companies. The U.S. implementation of GVEP, led by the U.S. Agency for International Development, is a 10-year initiative that seeks to increase access to modern energy services for those in developing countries in a manner that enhances economic and social development and reduces poverty. Through U.S. government support for GVEP and other energy access programs, 12.9 million people have received increased access to modern energy services since the 2002 Johannesburg Summit. For more information please visit www.gvep.org/.



Source: Courtesy of EPA

A woman in Uganda stands next to her clean cookstove, which reduces harmful indoor air pollution and improves the health of the family.

2. Partnership for Clean Indoor Air (PCIA)

Poor air quality caused by indoor and outdoor air pollution is related to approximately 2.5 million deaths annually and more than 2 billion people in the developing world face an increased environmental health risk due to breathing elevated levels of indoor smoke from home cooking and heating practices. The Partnership for Clean Indoor Air (PCIA) currently has more than 110 public and private partners working together to increase the use of affordable, reliable, clean, efficient, and safe home cooking and heating practices to reduce the burden of disease. PCIA is focusing on four priority areas: business models and markets for improved cooking and heating techniques; incorporating social and cultural practices to promote adoption of new technology; meeting design and performance guidelines for affordable, reliable, clean,

efficient, and safe home cooking and heating practices; and demonstrating reduced exposure to indoor air contaminants. The partners are contributing their resources and expertise to improve health, livelihood and quality of life by reducing exposure to indoor air pollution, primarily among women and children, from household energy use. Ten U.S.-funded PCIA pilot projects have already resulted in 56,000 people with reduced exposure to indoor air pollution from cooking and heating and 12,000 homes which have adopted improved cooking and heating practices in 2005. For more information, please visit www.PCIAonline.org.



Source: Courtesy of Sandia National Laboratory

A home in Veracruz, Mexico, obtains solar power as a result of a decade-long collaboration on energy projects between USAID and the U.S. Department of Energy's Sandia National Laboratory.

3. Partnership for Clean Fuels and Vehicles (PCFV)

The Partnership for Clean Fuels and Vehicles (PCFV) is working with developing countries to reduce vehicular air pollution by promoting the elimination of lead from gasoline, reducing sulfur from fuels, and introducing clean technologies into new and existing vehicle fleets. The U.S. EPA is a founding member and leading supporter of the PCFV, which has over 80 members from governments, industry, and civil society, representing more than 30 countries. Since the 2002 World Summit on Sustainable Development, PCFV has assisted in the elimination of lead in gasoline in 44 Sub-Saharan African countries, providing health benefits for over 733 million people. Through the work of the PCFV, up to 10 additional countries will have access to low-sulfur fuel by 2008. For more information, please visit www.unep.org/pcfV/main/main.htm.



Workers in Mexico City apply a banner to a retrofitted bus, stressing public health benefits of vehicle emissions control.

4. Efficient Energy for Sustainable Development (EESD)

The Efficient Energy for Sustainable Development initiative aims to improve the productivity and efficiency of current energy systems, and ensure that future energy systems are rational and efficient. The initiative is intended to reduce pollution, save money for both public and private sector enterprises, improve reliability and increase energy security. To implement the EESD initiative, DOE is working closely with the private sector, donor organizations, host governments and civil society in Asia, Mexico, South America,



With the help of the U.S. Government, a 200 kw fuel cell is inaugurated in Curitiba, Brazil.

Europe and Africa. For more information, please visit: www.sdp.gov/sdp/initiative/cei/44936.htm.

B. Renewable Energy and Energy Efficiency Partnership (REEEP)

Also formed at the 2002 WSSD, the Renewable Energy and Energy Efficiency Partnership (REEEP) seeks to accelerate and expand the global market for renewable energy and energy-efficiency technologies. As the world's largest producer and consumer of renewable energy, and with more renewable energy generation capacity than Germany, Denmark, Sweden, France, Italy, and the United Kingdom combined, the United States is one of 17 countries which are partners in REEEP. The United States also actively participated in the Renewables 2004 conference sponsored by the German Government in June 2004, and submitted five action items intended to provide specific technology plans and cost targets for renewable energy technologies using solar, biomass, wind, and geothermal resources. For more information, please visit www.reeep.org/.



A man in China turns on a light bulb powered by renewable energy.

C. Renewable Energy Policy Network for the 21st Century (REN21)

REN21 is a global policy network, which connects governments, international institutions and organizations, partnerships and initiatives, and other stakeholders on the political level with those “on the ground,” and is aimed at providing a forum for international leadership on renew-

able energy. Its goal is to allow the rapid expansion of renewable energies in developing and industrial countries by bolstering policy development and decision-making on sub-national, national and international levels. The United States serves as one of the eleven governments serving on REN21’s Steering Committee. For more information, please visit www.ren21.net/.



Source: Courtesy of DOE

Wind turbines on Ascension Island provide renewable energy.

V. U.S. Global Climate Change Partnerships



The world at night. Source: Courtesy of NASA

A. Asia-Pacific Partnership for Clean Development and Climate (APP)

The goal of the Asia-Pacific Partnership for Clean Development and Climate (APP), comprised of Australia, China, India, Japan, the Republic of Korea and the United States, is to help partners address national pollution reduction, energy security and climate change concerns. APP will promote and create enabling environments for the development, diffusion, deployment and transfer of existing and emerging cost-effective, cleaner technologies and practices, through concrete and substantial cooperation so as to achieve practical results. Areas for collaboration may include, but are not limited to: energy efficiency, clean coal, integrated gasification combined cycle, liquefied natural gas, carbon capture and storage, combined heat and power, methane capture and use, civilian nuclear power, geothermal, rural/village energy systems, advanced transportation, building and home construction and operation, bioenergy, agriculture and forestry, hydropower, wind power, solar power, and other renewables. The Partnership will also cooperate on the development, diffusion, deployment and transfer of longer-term transformational energy technologies that will promote economic growth while enabling significant reductions in greenhouse gas intensities. For more information, please visit; www.state.gov/g/oes/climate/c16054.htm.

B. Methane to Markets Partnership

Announced by the EPA in July 2004, the Methane to Markets Partnership is a new and innovative program to help promote energy security, improve environmental quality, and reduce greenhouse-gas emissions



The Pacific Rim as nightfall approaches.

Source: Courtesy of NASA

throughout the world. The Partnership works closely with the private sector in targeting methane recovery and reuse opportunities at oil and gas systems, underground coal mines, and landfills. EPA estimates that this Partnership could recover up to 500-billion cubic feet of natural gas



The Methane to Markets Partnership promotes landfill gas projects which use wells like the one shown here to capture methane and generate electricity and produce alternate fuels while reducing greenhouse gas emissions.

Source: Courtesy of EPA

(50-million metric tons of carbon equivalent) annually by 2015. Capturing and using “waste” methane will provide for a new energy source that stimulates economic growth and reduces global emissions of this powerful greenhouse gas. The United States will commit up to \$53 million to the Partnership over the next five years. Argentina, Australia, Brazil, China, Colombia, India, Italy, Japan, Mexico, Nigeria, Russia, Ukraine, and the United Kingdom joined the United States in launching the Methane to Markets Partnership at a November 2004 Ministerial meeting in Washington, D.C. and the Republic of Korea and Canada have also become members. The private sector, development banks, and other governmental and non-governmental organizations are encouraged to participate in the Partnership through becoming a member of the Project Network. For more information, please visit www.methanetomarkets.org. and www.epa.gov/methane/international.html.

C. International Partnership for the Hydrogen Economy (IPHE)

Anounced by the Secretary of Energy in April 2003 to implement internationally the goals of President

Bush’s Hydrogen Fuel Initiative and FreedomCAR Partnership, the United States hosted the first Ministerial meeting of the International Partnership for a Hydrogen Economy (IPHE) in Washington, D.C., in November 2003. The Partnership’s 16 countries and the European Commission (EC) are working together to advance the global transition to the hydrogen economy. The Partnership will work to advance research, development, and deployment of hydrogen and fuel-cell technologies, and develop common codes and standards for hydrogen use. The IPHE steering committee has officially recognized 10 collaborative projects to advance the group’s goals. For more information, please visit: www.iphe.net/ and www.eere.energy.gov/hydrogenandfuelcells/international_activities.html.

D. Carbon Sequestration Leadership Forum (CSLF)

The United States hosted the first meeting of the Carbon Sequestration Leadership Forum (CSLF) in Virginia, in June 2003. CSLF is focused on the development of improved cost-effective technologies for the separation and capture of carbon dioxide for its transport and



President Bush gets a hands-on demonstration of hydrogen technology at a hydrogen fueling station. The International Partnership for the Hydrogen Economy works to establish projects like this in support of its goal of organizing and implementing effective international research, development and implementation activities.

Source: Courtesy of the White House

long-term storage. The purpose of the CSLF is to make these technologies broadly available internationally, and to identify and address wider issues relating to carbon capture and storage. CSLF, which now includes 20 countries and the EC, has approved 17 capture and storage projects as well as a Technology Roadmap to provide future directions for international cooperation. For more information, please visit www.cslforum.org/ and www.fe.doe.gov/programs/sequestration/cslf/.



Source: Courtesy of: Petroleum Technology Research Centre

Carbon dioxide enters the Weyburn field from the Great Plains Synfuels Plant near Beulah, North Dakota. The gas travels 205 miles through a carbon steel pipeline and will be sequestered in an underground storage facility. Projects like this will comprise the Carbon Sequestration Leadership Forum.

E. Generation IV International Forum

The United States has led the development of the Generation IV International Forum, a multilateral partnership with nine other countries and Euratom, fostering international cooperation in research and development for the next generation of safer, more affordable, and more proliferation-resistant nuclear energy systems. This new generation of nuclear power plants could produce electricity and hydrogen with substantially less waste and without emitting any air pollutants or greenhouse-gas emissions. Since the Forum was formally established in July 2001, the United States has led the development of a technology roadmap, and increased support for R&D projects carried out in support of the Forum's goals. For more information, please visit: <http://gen-iv.ne.doe.gov/GENIVintl-gif.asp>.

F. ITER

In January 2003, President Bush committed the United States to participate in ITER, the largest and most technologically sophisticated research project in the world to harness the promise of fusion energy, the same form of energy that powers the sun. If successful, this \$5 billion, internationally supported research project will advance progress toward producing clean, renewable, commercially available fusion energy by the middle of the century. Other participants include the European Union, China, Japan, the Republic of Korea, and the Russian Federation. To read the President's statement, please visit: www.whitehouse.gov/news/releases/2003/01/20030130-18.html

G. Bilateral and Regional Partnerships

The United States has negotiated agreements with major international partners to pursue research on global climate change and deploy climate observation systems, collaborate on energy and sequestration technologies, and explore methodologies for monitoring and measuring greenhouse gas emissions. Since June 2001, the United States has launched 15 bilateral and regional partnerships with Australia, Brazil, Canada, China, Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), the European Union, Germany, India, Italy, Japan, Mexico, New Zealand, Republic of Korea, the Russian Federation, and South Africa on issues ranging from climate-change science to energy and sequestration technologies to policy approaches. The countries covered by these bilateral partnerships account for about 80 percent of global greenhouse gas emissions.



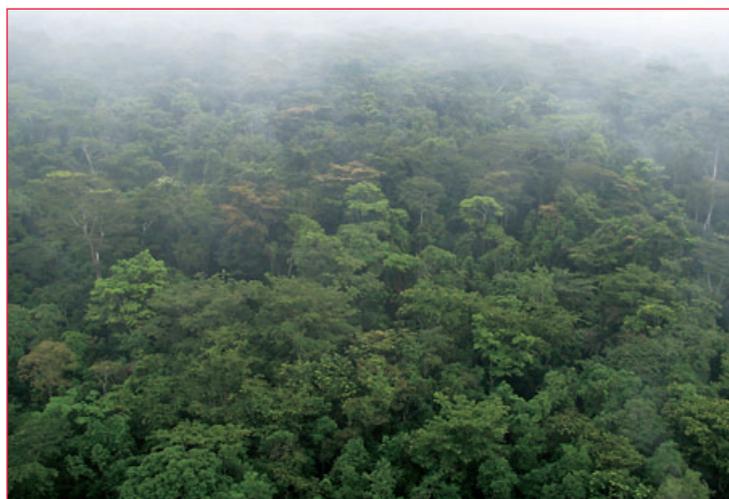
World map with locations of U.S. Climate Bilateral agreements.

H. Group on Earth Observations (GEO)

Of particular importance is the need for a broad global observation system to support measurements of climate variables. On July 31, 2003, the United States hosted 33 nations—including many developing nations—at the inaugural Earth Observation Summit, out of which came a commitment to establish an intergovernmental, comprehensive, coordinated, and sustained Earth observation system. While the use and benefits of these observations are extensive, the climate applications of the data collected by the system include the use of the data to create better climate models, to improve our knowledge of the behavior of carbon dioxide and aerosols in the atmosphere, and to develop strategies for carbon sequestration. The United States was instrumental in drafting a ten-year implementation plan for a Global Earth Observation System of Systems, which was approved by 55 nations and the European Commission at the 3rd Earth Observation Summit in Brussels in February 2005. The United States also released its contribution through the Strategic Plan for the U.S. Integrated Earth Observing System in April 2005. The plan will help coordinate a wide range of environmental monitoring platforms, resources, and networks. For more information, please visit: <http://earthobservations.org>.

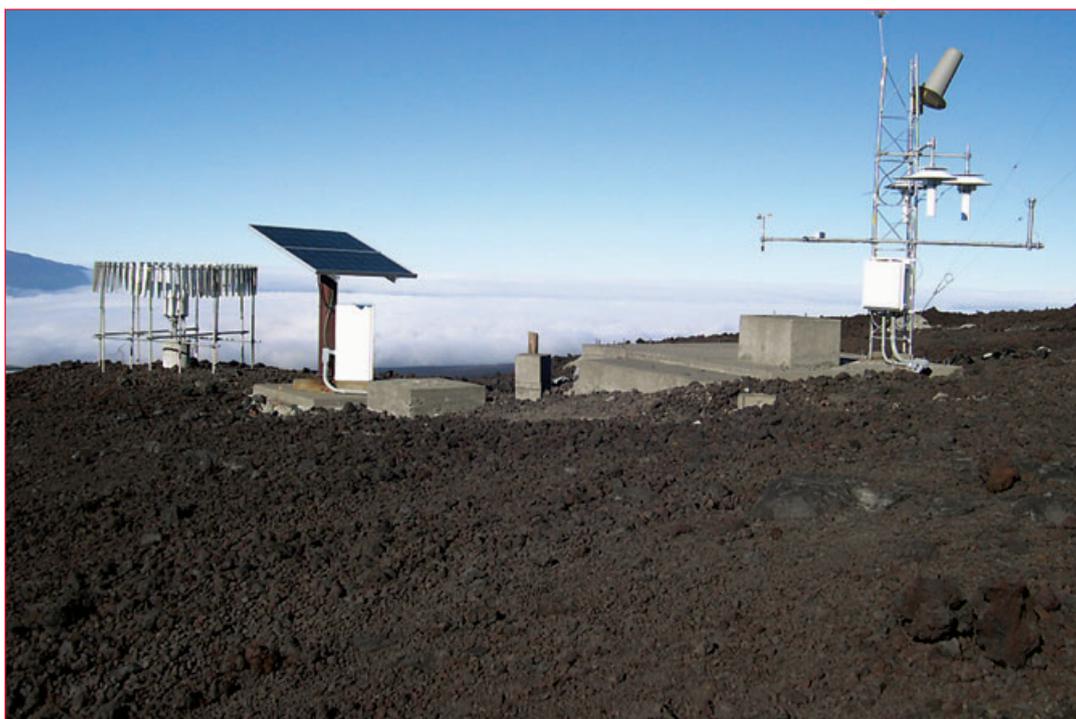
I. Tropical Forest Conservation Act (TFCA)

Tropical Forest Conservation Act (TFCA) agreements are offered to eligible developing countries to relieve certain official debt owed the United States while at the same time generating funds to support local tropical forest conservation activities that store carbon. As of May 2005, eight countries have TFCA agreements, which will generate over \$95 million for tropical forest conservation: Bangladesh, Belize, Colombia, El Salvador, Jamaica, Panama (two agreements), Peru, and the Philippines. For more information, please visit: www.usaid.gov/our_work/environment/forestry/intro_tfca.html.



Source: Courtesy of Conservation International

Primary Forest of Sapo National Park, Liberia's first protected area and one of the largest remaining contiguous tracts of the Upper Guinean Forest remaining. The U.S. Government is funding an ambitious forest sector reform effort, focusing on promoting sustainable forest management and expanding conservation in Liberia.



Source: Courtesy of NOAA

A Climate Reference Network monitoring station operated by NOAA collects climate data at the top of Mauna Loa mountain in Hawaii.

J. President's Initiative Against Illegal Logging

On July 28, 2003, the U.S. Department of State launched the President's Initiative Against Illegal Logging, developed with the objective of assisting developing countries in their efforts to combat illegal logging, including the sale and export of illegally harvested timber, and in fighting corruption in the forest sector. The initiative represents the most comprehensive strategy undertaken by any nation to address this critical clean development challenge, and reinforces the U.S. leadership role in taking action to counter the problem and preserve forest resources that store carbon. For more information, please visit www.state.gov/r/pa/prs/ps/2003/22843.htm.

K. Global Environment Facility (GEF)

The Global Environment Facility (GEF) is the financial mechanism under the UNFCCC. The United States contributes more than any other country to the GEF. The FY 2006 request for the GEF includes \$25 million for climate change-related programs, roughly 23 percent of the total request for GEF (\$107.5 million). This commitment will fund technology transfer and capacity building in developing countries. For more information, please visit www.gefweb.org/.



Source: J. Holden, Fauna & Flora International

Illegally cut logs in the (then proposed) western extension of Sapo National Park, December 2002. Enforcement of forestry laws has been weak; however the U.S. Government is currently the main international supporter of reforming commercial forestry in Liberia.

NOTES



Front Cover Photos:

- Commonwealth Edison nuclear power plant, supplying electricity to Chicago since 1972.
Source: AP/WWP
- Drought in southern Africa, February 2003.
Source: F. Sands, USAID
- Subcompact Fluorescent Coil light bulb.
Source: Courtesy of DOE/NREL
- A canoe on the Niger River at sunset.
Source: L. Lartigue, USA
- Solar line-concentrator power plant with troughs built by Luz.
Source: Courtesy of DOE/NREL
- Wind farm.
Source: Courtesy of GE Energy, 2005 General Electric International
- Bus Rapid Transit (BRT) system passengers beat the traffic jam using the Jl Hayam Wuruk busway in Jakarta, Indonesia.
Source: Institute for Transportation and Development Policy (ITDP)





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www.state.gov/g/oes/climate

Sustainable Development Partnerships

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