

DEPARTMENT OF ENERGY

Since 2001, the Administration:

- Completed or is implementing nearly 75 percent of the 106 recommendations contained in the President's comprehensive National Energy Policy, such as filling the Strategic Petroleum Reserve to its capacity of 700 million barrels. The Administration worked with the Congress on the energy legislation needed to carry out the remaining recommendations;
- Launched aggressive "zero-emissions" initiatives for hydrogen fuel cells, clean coal, nuclear, and fusion power to increase the Nation's supply of clean, affordable energy;
- Proposed over \$1.1 billion through 2005 to improve the energy efficiency of nearly 500,000 homes of low-income families;
- Accelerated remediation of the Department's nuclear waste sites, which are now scheduled to be cleaned up 35 years sooner and will save taxpayers about \$50 billion; and
- Cleared the path to operating a safe nuclear waste repository at the Yucca Mountain site by 2010.

The President's Budget:

- Increases funding significantly for clean energy resources, including substantial increases to build and operate the world's first zero-emissions coal-fueled power plant and expand research on hydrogen and fuel cell technologies;
- Builds on the progress begun in the 2004 Budget to support a long-range nuclear stockpile stewardship plan that fulfills the Nation's nuclear weapons requirements;
- Strengthens nonproliferation programs that reduce the threat of weapons of mass destruction by securing or eliminating fissile material;
- Invests in energy-efficiency improvements to the homes of about 119,000 low-income families in 2005, nearly 30 percent more homes than in 2004;
- Invests in electricity transmission technology improvements to help avoid electricity blackouts; and
- Expands scientific knowledge through increased investments in the Nation's scientific user facilities and in cutting-edge research and development, including nanotechnology and information technology.

Department of Energy

Spencer Abraham, Secretary

www.energy.gov 202-586-5000

Number of Employees: 16,100 Federal and 100,000 contract

2005 Discretionary Budget Authority: \$24.3 billion (gross)

Key Components: 24 research laboratories and facilities, four power marketing administrations, and 114 contaminated cleanup sites affecting about two million acres of land.



President Bush and Secretary Abraham inspecting a fuel cell vehicle.

OVERVIEW

The Department of Energy (DOE) protects our national and economic security by: 1) promoting the diverse supply and reliable delivery of affordable and environmentally sound energy; 2) applying advanced science and nuclear technology to the Nation's defense; 3) providing world-class basic research capacity and advancing fundamental scientific knowledge; and 4) providing a responsible resolution to the environmental legacy of the Cold War and providing for the permanent disposal of the Nation's high-level radioactive waste.

The 2005 Budget provides significant funding increases for research and development of clean coal and hydrogen fuel cell technologies, and invests in longer-term technologies such as next-generation nuclear and fusion energy. It also improves energy security by meeting the President's commitment to fill the Strategic Petroleum Reserve to its maximum capacity of 700 million barrels in 2005, and by increasing funding for electricity reliability research and development to help prevent electricity disruptions.



Breathing easier. The Nation can increase energy production while maintaining environmental values through projects such as this clean coal project in the Denali National Park and Reserve, an environmentally sensitive area in Alaska.

The 2005 Budget provides \$9.0 billion for the national security activities of the National Nuclear Security Administration to include maintaining the safety, security, reliability and effectiveness of the Nation's nuclear weapons stockpile; preventing the spread of materials, information, and technology of weapons of mass destruction by eliminating or securing nuclear materials and related infrastructure and providing the U.S. Navy with safe, effective nuclear propulsion plants.

America's economic strength depends on our Nation's rich tradition of creative technological innovation. Because investment in fundamental research and development provides the foundation for such innovation,

significant Department of Energy resources are dedicated to delivering the scientific breakthroughs that will transform our future. Two top priority areas expected to have significant economic impact—nanoscale science and technology, and networking and information technology—are supported and advanced with funding research increases.

The Department's environmental efforts include the cleanup of contamination resulting from over 50 years of nuclear weapons production and nuclear energy research. The 2005 Budget provides over \$7.4 billion for the Department's Environmental Management program, a five-percent increase and the most funding ever for this program. This Budget will allow the Department to stay on track to cut in half the number of years remaining to complete site cleanups. The Budget also substantially increases funding for a nuclear waste repository at Yucca Mountain, Nevada, and proposes a new funding mechanism to ensure that the Department can begin accepting waste on schedule in 2010.

The Department has also shown significant improvement in its management. It is among the top performers in meeting the challenges of the President's Management Agenda.

EXPANDING ENERGY SUPPLY

We're heading into a new era. We've got to think new. We've got to be ready for the 21st Century... And a 21st Century energy policy says this country must develop and deploy the latest technology to provide a new generation, a different kind of energy, new sources of energy, cleaner and more efficient energy sources.

President George W. Bush
October 2003

The President's National Energy Policy, developed during the President's first year in office, set out the first comprehensive plan in over a decade to enhance the supply of reliable energy while protecting our environment. In less than three years the Administration has completed or is implementing nearly all of the plan's 106 recommendations that did not require legislation.

The President has proposed and supported bold research and development activities that, if successful, will provide the abundant energy supply that will fuel future economic growth. These activities include finding and exploiting breakthroughs in hydrogen fuel cells, clean coal technology, and nuclear power. As with all research, we may not find all the answers we need to realize the promise in each of these areas. But the successful development of even one of these efforts will have a profound effect on the country's energy security and environmental and economic well-being.

Moving Toward a Hydrogen Economy

In February 2003, President Bush announced a \$1.2 billion Hydrogen Fuel Initiative to reverse America's growing dependence on foreign oil by developing the technology for clean hydrogen production and commercially viable hydrogen-powered fuel cells. So that we can one day power cars, trucks, homes and businesses while producing virtually no pollution or greenhouse gases, the Hydrogen Fuel Initiative and the FreedomCAR Partnership, which was launched a year earlier, will provide a total of \$1.7 billion over five years for hydrogen, fuel cell, and advanced automotive technologies. The President's initiative established the United States as the international leader in hydrogen and fuel cell research, and spurred significant private-sector investment in these areas. The 2005 Budget includes \$228 million for the Hydrogen Fuel Initiative, an increase of \$69 million, or 43 percent, over 2004 funding, to develop the technologies to produce, store, and distribute hydrogen for use in fuel-cell

vehicles, electricity generation, and other applications. A new thrust of this Presidential initiative is a comprehensive program of innovative, high-risk, high-payoff basic research that is intimately coupled and coordinated with the initiative's applied research and development programs.

Developing Cleaner Coal Technologies

The 2005 Budget provides \$447 million for the President's Coal Research Initiative to improve the environmental performance of coal power plants by reducing emissions and improving efficiency. This includes \$287 million for the Clean Coal Power Initiative (CCPI), a \$108 million increase (60 percent) over the 2004 funding level. Within this initiative, \$237 million is provided for the FutureGen coal-fired, nearly emissions-free electricity and hydrogen generation project announced by the President in February 2003. This project will re-direct clean coal funding that has languished unexpended and unproductive for years. This \$1 billion cost-shared, 10-year project is guided by an industry and international partnership that will work cooperatively on research, development and deployment of technologies that will dramatically reduce air pollution from coal-fueled electricity generation plants, generate hydrogen, and capture and store greenhouse gas emissions.

The President's Clean Coal Commitment

The President committed to invest \$2 billion over 10 years to fund research in clean coal technologies. The President's four budgets have included \$1.4 billion for clean coal technology research and development, well on the way to fulfilling this commitment. Coal is reliable, affordable, and abundant in the United States. The President's clean coal investments will help ensure that coal remains a primary energy source for the Nation.

Encouraging Next Generation Nuclear Power and Fusion

The Administration has taken steps to encourage nuclear power as a clean, reliable, and affordable source of electricity in the coming decades, including streamlining the permitting process for new nuclear power plants, proposing tax changes to help ensure that nuclear plant decommissioning costs are adequately funded, providing a deep geological repository for high-level nuclear waste at the Yucca Mountain site, and proposing extension of the Price-Anderson nuclear liability Act. The 2005 Budget continues these efforts by providing \$31 million for research and development on Generation IV nuclear power technology, a \$7 million increase over 2004 funding. Generation IV technology offers the promise of a safe, economic, and proliferation-resistant source of clean nuclear power and hydrogen. The Budget also continues research on advanced, proliferation-resistant nuclear fuel that would allow the Nation to extract the energy potential from spent nuclear fuel and dramatically reduce the quantity and toxicity of remaining waste.

In January 2003, President Bush committed the United States to participate in negotiations on the largest and most technologically sophisticated energy research project in the world—the International Thermonuclear Experimental Reactor (ITER)—to harness the promise of fusion energy, the form of energy that powers the sun. The United States and its international partners—the European Union, Japan, Russia, China, and South Korea—plan to reach a consensus decision on the site for ITER early in 2004. If successful, this cost-shared \$5 billion research project will help develop fusion's potential as a commercially viable and clean source of energy in the middle of the century. The \$38 million provided for this international partnership in the 2005 Budget, a \$30 million increase over 2004 funding, will ensure that the United States is prepared to participate fully in this important project.

Providing Incentives for Renewable Energy and Hybrid and Fuel Cell Vehicles

The 2005 Budget proposes tax incentives totaling \$4.1 billion through 2009 to spur the use of clean renewable energy and energy-efficient technologies. Consistent with the President's National Energy Policy, the tax incentives include credits for the purchase of hybrid and fuel-cell vehicles, residential solar heating systems, energy produced from landfill gas, electricity produced from alternative energy sources such as wind and biomass, and combined heat and power systems. All of these incentives are included in energy legislation currently pending in the Congress.

Reducing the Size and Frequency of "Blackouts"

The President's National Energy Policy directed Federal agencies to remove constraints on the interstate transmission grid to help ensure that the Nation's electricity can flow more freely and reliably. DOE created the Office of Electric Transmission and Distribution in 2003 to lead a national effort to modernize and expand the Nation's electricity delivery system and reduce the likelihood and impact of disruptions and blackouts, such as the blackout that occurred in August 2003 affecting an area that includes 50 million people, eight States, and one Canadian province. The Budget includes \$91 million for these activities, a \$10 million (12-percent) increase over 2004 funding. The Administration has also worked with two private companies since 2002 to carry out a private-sector financing arrangement for construction of the Path 15 transmission facilities associated with the Federal Western Area Power Administration. This project will relieve a major transmission bottleneck in northern California when it is put in operation in 2004. The Administration strongly supports legislative changes to modernize our electricity transmission grid by reforming outdated laws, promoting open access to the grid, promoting regional planning and coordination, protecting consumers, and developing and deploying new technology. To accelerate the transition to competitive wholesale power markets, the Administration also supports changes to Federal tax law concerning gains from the sale or disposition of transmission assets and preserving the tax-exempt status of rural electric cooperatives that provide open access to their transmission or distribution facilities.



I am a lineman for the country. Local transmission problems can lead to regional blackouts. The Administration is leading a national effort to improve transmission reliability.



What's in your attic? Energy efficiency improvements can save more than \$4,000 per home.

Increasing Weatherization Assistance

The 2005 Budget continues the President's commitment to increase funding for the Weatherization Assistance Program by \$1.4 billion over the next 10 years in order to cut the utility bills of 1.2 million low-income families while conserving energy. The 2005 Budget includes \$291 million for this program, a \$64 million (28-percent) increase over 2004 funding, which will improve the energy efficiency of an additional 119,000 homes of low-income families. OMB and DOE completed an evaluation of this program using the Program Assessment Rating Tool (PART), which concluded that the program generally achieves its goals while maintaining a positive economic return on the taxpayers' investment.

The program's energy-efficiency measures save each participating low-income family an estimated \$210 annually on utility bills, at an average one-time cost to the Government of about \$2,500. With an average lifespan of 20 years, the improvements generate more than \$4,000 in total utility bill savings per home.

CLEANING UP THE ENVIRONMENT

Securing Radioactive Waste

DOE is charged with disposing of the spent nuclear fuel generated by civilian nuclear power plants, Government nuclear reactor facilities, and the high-level waste from the Nation's defense activities. More than 161 million Americans live within 75 miles of the 131 sites in 39 States that currently store spent nuclear fuel and high-level radioactive waste. In February 2002, the President recommended the Yucca Mountain site to the Congress as being qualified for a construction permit application to the Nuclear Regulatory Commission (NRC) as a nuclear waste repository. The Congress approved that recommendation in July 2002. The successful completion of a repository at Yucca Mountain will ensure the Nation has a single underground facility, secure from potential terrorist threats, that stores nuclear waste in a manner that protects the environment and our citizens.



Due to open in 2010.

The Administration is committed to submitting on schedule in 2004 a license application to the NRC to authorize construction of the repository. Substantial resources will be needed to complete the application process and construct the repository. The 2005 Budget includes \$880 million for the repository, an increase of \$303 million over 2004 funding. The Budget also includes a legislative proposal to use utility company contributions to establish a new funding mechanism that will ensure that adequate funds are available for the repository to begin accepting waste in 2010. The Department is also taking a number of steps to ensure effective monitoring of this major construction endeavor, including establishing a clear cost and schedule baseline for evaluating performance and providing for regular reporting to the Congress.

Accelerating Cleanup of Legacy Sites

Over five decades of nuclear weapons production and energy research have left vast amounts of radioactive contamination and hazardous waste at 114 sites in 31 States and one U.S. territory. By the end of 2004, DOE will have cleaned up 77 of the 114 sites, but the largest and most challenging site cleanups lie ahead.

The 2005 Budget includes \$7.4 billion for the Environmental Management (EM) program, the most ever requested for environmental cleanup at DOE sites throughout the Nation. Within this total funding, \$350 million will be made available only to the extent that legal uncertainty concerning certain reprocessing wastes is satisfactorily resolved through pending litigation or by new legislation.

A Rocky Road to Cleanup

In 1999, the EM program awarded a \$4 billion contract with significant incentives to accelerate closure of the Rocky Flats site by seven years to December 2006. Despite delays in critical-path activities such as shipping nuclear materials to the Savannah River site, this project was seven percent below budget and eight percent ahead of schedule at the end of 2003. The Department anticipates completing this site, which will become a wildlife refuge, by September 2006 or earlier.

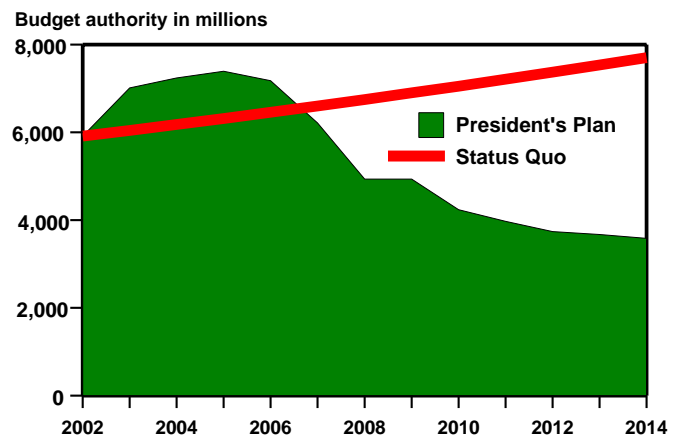
For many years the Environmental Management program failed to achieve its risk-reduction mission, was unable to effectively control cost and schedule overruns, and experienced significant problems in project management and contract administration. DOE's top-to-bottom review of the program in 2002 found that it was focused on managing risk rather than reducing risk. To improve program performance, the 2003 Budget proposed an aggressive reform effort with States and Federal regulators to revise cleanup plans to

accelerate reduction of risk to the public and the environment. DOE has now revised the cleanup strategies for 18 of the sites remaining to be completed. The revised cleanup plans cover a broad range of issues—from new waste treatment and disposal options, to cleaning up the most risky areas first, to simply increasing the number of workers assigned to critical cleanup activities. Under the Administration's revised cleanup plans, DOE expects to accelerate cleanup completion by 35 years, more than a generation ahead of the previous schedule. It also expects to save about \$50 billion doing so, reducing estimated total lifecycle cleanup costs from \$192 billion to \$142 billion.

In addition to revised cleanup strategies, DOE has taken other significant steps to improve the EM program:

- *Improved Contracts.* DOE has re-competed or renegotiated most EM contracts to include performance incentives to protect the public faster and for less money. These new contracts have allowed cleanup sites such as Mound and Fernald in Ohio to get back on track for closure in 2006.
- *Reorganized Staff.* DOE has reorganized the EM Federal staff to focus on the cleanup mission. The EM program has also eliminated or transferred activities that do not support on-the-ground risk reduction. These efforts have resulted in a 24-percent decrease in EM full-time equivalent employees since 2001.
- *Consolidated Business Center (CBC).* DOE is transitioning business functions from its completed and smaller sites to the CBC. This will improve program performance by consolidating functions and providing for a cadre of skills and expertise in closing sites.

Savings from Cleanup Reforms



Accelerating Assistance to Energy Employees

The President's 2005 Budget includes \$43 million for the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) to accelerate assistance to those DOE contract employees and their survivors who have served our Nation as part of the nuclear weapons complex and suffered an illness because of exposure to toxic substances during such service. Together with funds provided

in 2003 and 2004, this will enable DOE to expedite the processing of applications, eliminate the current backlog of applications up to the Physicians Panels in 2005, and eliminate the backlog through the Physicians panels in 2006. The Administration will also work with the Congress on solutions to problems identified since passage of EEOICPA.

EXPANDING SCIENTIFIC KNOWLEDGE

The Department's Office of Science supports a broad array of basic research and operates a variety of unique scientific facilities to support the Department's energy and national security missions. The Office provides more than 40 percent of total Federal funding for basic research in the physical sciences, as well as serving as

the principal Federal funding agency for research in high energy physics, nuclear physics, and fusion energy sciences. It also supports research in areas such as climate change, environmental remediation, genomics, computer science, and applied mathematics. The success of the Office's research program has been exceptional. In the past decade alone, 12 Nobel Prizes in physics and chemistry have been awarded to scientists for work supported by the Office of Science.

The 2005 Budget proposes \$3.4 billion for DOE Science programs. The PART assessments conducted for these programs concluded that they were generally well-managed and produce highly regarded research results. The Budget allocates funds to best performers and activities that provide the broadest benefits to society.

In fact, we might well be called the Department of Energy and Science, given the importance of our role in American, and indeed international, science.

Secretary Abraham
January 2003

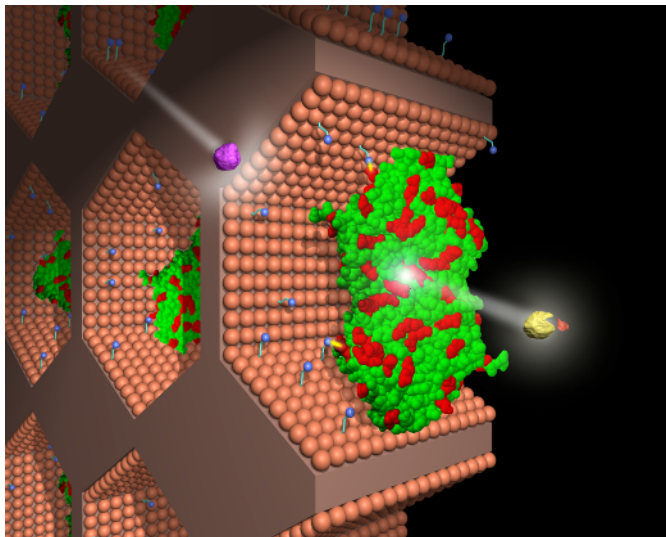


The Advanced Photon Source at Argonne National Laboratory outside of Chicago, Illinois is 3,640 feet in circumference (large enough to encircle Wrigley Field) and will host 2,500 users in 2005.

THE BIG PICTURE

DOE's Office of Science builds and operates many of the Nation's most advanced, large-scale scientific user facilities, including x-ray and optical light sources, particle accelerators, supercomputers, and fusion devices. This suite of state-of-the-art facilities is broadly shared with the science community worldwide and contains technologies and instrumentation available nowhere else. Each year, these facilities are used by more than 18,000 researchers from universities, other government agencies, private industry, and foreign nations. The 2005 Budget provides funds to allow many of these facilities to operate at full capacity in order to maximize their scientific return to the Nation.

The 2005 Budget will enable cutting-edge research across a wide expanse of scientific endeavor, from attempting to understand the birth of the universe to learning how to guide nature's own efficient assembly techniques in order to make cheaper, stronger, and lighter materials for applications like hydrogen fuel cells. The Budget increases research funding to expand supercomputing capacity, and funds new facilities that would keep the United States at the forefront of important new scientific areas, such as nanotechnology and biotechnology. For example, in keeping with the spirit of the 21st Century Nanotechnology Research and Development Act, which President Bush recently signed into law, the Budget funds continued materials and chemistry research at the nanoscale level, and new or ongoing construction of five nanoscale science research centers. The Budget funds procurement activities for a revolutionary x-ray laser light source—located on the Stanford University campus—that would open entirely new realms of discovery in the chemical, materials, and biological sciences. The Budget also funds the design of a first-of-its-kind protein research facility, which could lead to practical applications of genomic research for the energy and environmental challenges that the Nation faces.



The small picture. New user facilities should enable future breakthroughs combining biotechnology and nanotechnology, such as this artist's conception of a synthetic nanostructure that efficiently transforms toxic substances into harmless by-products.

POWER MARKETING ADMINISTRATIONS

The Power Marketing Administrations (PMAs)—Southeastern, Southwestern, Western Area (WAPA) and Bonneville (BPA)—sell electricity generated at 133 multipurpose Federal dams and related facilities operated by the U. S. Army Corps of Engineers (Corps) and the Department of the Interior's Bureau of Reclamation (BuRec). They also manage more than 33,000 miles of federally owned transmission lines.

The 2005 Budget provides \$187 million for Southeastern, Southwestern and WAPA and includes a proposal to allow these PMAs to directly finance the Corps' and BuRec's power-related operation and maintenance expenses from power receipts rather than from appropriations (as BPA already does). Direct funding will enable the Corps and BuRec to perform needed maintenance and small rehabilitation projects on a more timely basis. The Administration also proposes to have BPA and WAPA directly finance BuRec's hydropower research and development activities, for which they are the primary beneficiaries.

BPA finances its \$3.7 billion annual cost of operations and investments primarily using power revenues and loans from the U.S. Treasury. The amount of loans from the U.S. Treasury is currently capped by statute at \$4.45 billion. BPA has also started seeking non-Federal



Direct Current. The Administration proposes that the PMAs be allowed to directly fund improvements to Bureau of Reclamation and Corps of Engineer facilities.

participation and joint financing and ownership of its transmission system upgrades and other investments. BPA will coordinate with the Secretary of Energy or his designee on such alternative financing opportunities before exercising its borrowing authority.

Consistent with scorekeeping procedures developed under the Budget Enforcement Act of 1990, some agency lease-purchase transactions constitute a form of Federal agency debt for budget purposes. This reflects the fact that these long-term transactions result in liabilities that make a claim on future agency resources similar to a traditional loan transaction. (The scorekeeping procedures are discussed at more length in the *Analytical Perspectives* volume.) At the time the 2005 Budget was being printed, BPA was considering whether it would enter into such a lease purchase transaction. As stated above, BPA's debt to the U.S. Treasury is currently limited by statute. To ensure the integrity and usefulness of this limitation, the Administration is considering proposing legislation calling for certain non-traditional financing transactions that are entered into after the date the legislation is enacted and that are similar to debt-like transactions to be treated as debt and counted toward BPA's statutory debt limit. This legislative proposal will be fully vetted with BPA stakeholders.

NATIONAL NUCLEAR SECURITY ADMINISTRATION

The mission of DOE's National Nuclear Security Administration (NNSA) is to:

- maintain and enhance the safety, security, reliability, and effectiveness of the Nation's nuclear weapons stockpile;
- prevent the spread of materials, information, and technology of weapons of mass destruction by eliminating or securing nuclear materials and related infrastructure; and
- provide the Navy with safe and highly capable nuclear propulsion plants for warships.



Coming together. Administrator of the NNSA, Linton Brooks, examines nuclear weapon components manufactured at the NNSA facility in Kansas City, Missouri.

Nuclear Stockpile Stewardship

As the post-Cold War era evolves, NNSA is managing the Nation's nuclear deterrent and ensuring that it is capable of responding to 21st Century challenges unlike those faced during the last half of the 20th Century. Since 1993, and the establishment of a moratorium on nuclear testing, DOE has maintained the safety, security, reliability, and effectiveness of the U.S. nuclear weapons stockpile through its science-based stockpile stewardship program. The program ensures the operational readiness of the Nation's nuclear weapons using science and technology to detect and predict problems in the stockpile. NNSA also relies on advanced engineering methods to develop and apply solutions to extend the life of aging warheads.

Knowledge gained from this program improves the understanding of nuclear weapons physics; enables timely and effective maintenance and refurbishment of existing nuclear warheads; and maintains a design and manufacturing base that can respond rapidly to new challenges and produce new weapons if required. Three national laboratories (Los Alamos, Sandia, and Lawrence Livermore), the Nevada Test Site, and production

facilities in Missouri, South Carolina, Tennessee, and Texas, employ about 1,500 Federal and approximately 25,000 contract personnel to do this work.

The 2005 Budget continues to emphasize programs supported in the Nuclear Posture Review (NPR) released by the Administration in January 2002. The NPR laid out the direction for America's nuclear forces for the next decade. It noted that the Nation's nuclear infrastructure had atrophied since the end of the Cold War and that the evolving security environment requires a flexible and responsive weapons complex infrastructure. To that end, the 2005 Budget reflects an increase over the 2004 enacted level in the Weapons Activities account, which encompasses the stockpile stewardship programs. This increase, along with a multi-year plan supported by sustained, stable funding, will enable NNSA to fulfill the Nation's needs for a safe, secure, reliable and effective nuclear force. The 2005 Budget requests \$6.6 billion for activities related to maintaining the nuclear weapons stockpile, \$365 million above the 2004 enacted level, and consists of four major categories of work:

- Directed Stockpile Work programs to support the Department of Defense's (DOD's) nuclear weapons requirements by maintaining and refurbishing warheads to ensure their safety, reliability, and performance. Programs include research, development, and production associated with weapons maintenance, life extensions, and certification of continued reliability. Currently, NNSA is in the process of refurbishing four weapons that originally entered service in the 1970s and 1980s. Without new warheads entering the inventory, a robust refurbishment program is the only way to maintain the nuclear deterrent with a high degree of confidence.
- Facility Operations and Infrastructure Programs that underpin the stockpile work by providing for the operation and maintenance of existing facilities and construction of new facilities. Because facilities have continued to decay since the end of the Cold War, NNSA is embarking on an effort to improve conditions throughout the complex.
- Security Programs to protect the nuclear weapons complex, nuclear weapons and their components within that complex, and transportation of material between facilities. NNSA also operates the Nuclear Weapons Incident Response assets that provide first-responder teams in the event of a nuclear emergency.
- Science programs to develop and maintain critical capabilities needed to certify the reliability of the nuclear stockpile into the future. Some of the key components of the science programs are:
 - The Inertial Confinement Fusion program, which includes construction and operation of the National Ignition Facility at Lawrence Livermore National Laboratory in California. This project has a 192-beam laser to duplicate the conditions of high temperature and pressure that occur in a nuclear explosion so that scientists can better evaluate the science related to performance of nuclear warheads. The PART assessment completed on this program showed that improved planning is overcoming initial difficulties, but performance measures need additional refinement.
 - Advanced Simulation and Computing efforts involving the world's largest and fastest computers to perform calculations and simulations that previously were too complex to perform.



The National Ignition Facility, at Lawrence Livermore National Laboratory, is a cornerstone of NNSA's science-based nuclear stockpile stewardship program that ensures the long-term safety, reliability, and effectiveness of the stockpile without nuclear testing.

These simulations model the behavior of an exploding nuclear weapon and are an integral part of certifying the reliability of the stockpile without underground nuclear testing.

- The Plutonium component manufacturing and certification program that will develop new plutonium cores for nuclear weapons to replace existing ones. The life expectancy for the current inventory is uncertain.

Managing the Stockpile Stewardship Program continues to be an enormous challenge. Throughout the Cold War, DOE maintained a viable nuclear stockpile by designing and producing new weapons on a 15- to 20-year cycle and ensured the effectiveness of the weapons through underground testing. However, the United States last produced a new weapon in 1990 and conducted a nuclear test in 1992. DOE is developing new tools to manage the stockpile without the design and underground testing that historically supported the stockpile. This work will remain critical even as the United States draws down the number of operationally deployed warheads to between 1,700 and 2,200 over the next 10 years.

Preventing the Spread of Weapons of Mass Destruction

Preventing the spread of weapons of mass destruction (WMD) around the world continues to be an urgent priority of this Administration. The importance of this goal was underscored after the September 11th terrorist attacks and the discovery of evidence that terrorists were seeking to obtain WMD.

In June 2002, under the leadership of the United States, the G-8 nations agreed to a new comprehensive nonproliferation effort known as the Global Partnership. The goal of the Partnership is to stop the spread of weapons of mass destruction, related materials and technology, and expertise. To achieve the goal, the G-8 leaders committed to spend up to \$20 billion over 10 years to fund nonproliferation programs in the former Soviet Union. The United States intends to provide half of the total funding through programs in DOE, DOD, and the Department of State. The 2005 overall request for Global Partnership programs totals nearly \$1 billion and consists of:



Coal Comfort. This Soviet era weapons-grade plutonium-producing nuclear power facility in Seversk, Russia will be replaced, under NNSA leadership, with a coal burning facility.

- \$439 million in DOE NNSA programs that support programs to secure or eliminate weapons-usable material;
- \$409 million in DOD Cooperative Threat Reduction programs that provide assistance in dismantling nuclear weapons and provide transport and storage security; and
- \$71 million in Department of State programs that support export control programs and other nonproliferation efforts to include those targeted at preventing the spread of WMD expertise.

Highlights of NNSA programs in the Global Partnership include:

- \$238 million for the International Nuclear Materials Protection and Cooperation program to secure nuclear materials in the former Soviet Union. These programs fund critical activities such as installation of intrusion detection and alarm systems and construction of fences around exposed nuclear sites. By the end of 2005, NNSA will have supported completion of comprehensive

security upgrades to 41 of 64 identified nuclear sites and will have begun work to secure roughly 37 percent of the weapons-grade nuclear material at these sites.

- \$50 million for the program to eliminate weapons-grade plutonium production in Russia. This program will replace three Soviet-era reactors with coal burning plants and stop the annual production of 1.2 metric tons of weapons-grade plutonium by 2011. The 2005 PART assessment of the program found that it possesses solid performance measures and encouraged NNSA to study the lessons learned from other nonproliferation programs to reduce the overall risk and potentially accelerate the program to more rapidly achieve the intended results.

In addition to the Global Partnership programs, the Budget requests \$910 million in 2005 for other nonproliferation programs managed by NNSA. Highlights include:

- \$220 million for the Nonproliferation Research and Development program to develop technologies needed to detect nuclear proliferation abroad; and
- \$484 million to support the U.S. portion of an agreement to dispose of surplus plutonium. Under the agreement, both the United States and Russia agree to dispose of 34 metric tons of plutonium by converting it to a mixed oxide fuel and burning it as fuel for nuclear reactors.

Naval Reactors



The USS Florida steams under the power of reactors developed by NNSA.

NNSA's Naval Reactors program continues its impressive record developing safe and reliable nuclear reactors to power the Navy's warships. The program is responsible for all naval nuclear propulsion work, beginning with technology development, continuing through reactor operation and, ultimately, to reactor plant disposal. The Naval Reactors program is currently developing nuclear propulsion plants to support DOD's efforts to transform itself for 21st Century national security requirements. By the end of 2005, the goal is to complete 70 percent of the design of the next generation aircraft carrier reactor. Furthermore, the Naval Reactors program will continue work on its Transformational Technology Core, which will deliver a significant energy increase to future submarines.

Finally, the program will continue to ensure the safety and reliability of 103 operating naval reactor plants and will add to its record of 129 million miles without a reactor accident or a significant release of radioactivity to the environment.

PERFORMANCE EVALUATION OF SELECT PROGRAMS

The Budget continues to focus on improving program performance. Thirty-six of DOE's programs were assessed using the Program Assessment Rating Tool (PART), which evaluated the programs' design and purpose, strategic planning efforts, how well they are managed, and whether they are generating positive results for taxpayers. Below are some of the highlights and recommendations from the PART evaluations. For further details on DOE's performance assessments, see the White House budget website at www.whitehouse.gov/omb/budget/.

Program	Rating	Explanation	Recommendation
Strategic Petroleum Reserve	Effective	The program is well designed with well developed performance measures.	Improve linkage of budget requests to program goals.
NNSA—Readiness in Technical Base and Facilities (RTBF), Operations	Moderately Effective	Good planning is beginning to overcome difficult early stages that led to problems in the infrastructure.	Improve mechanisms to gain leverage over operating contractors; establish a plan that integrates RTBF with the Facilities and Infrastructure Recapitalization Program.
NNSA—Inertial Confinement Fusion Ignition and High Yield Campaign	Moderately Effective	The program has vastly improved its strategic design and focus; clear, succinct performance measures are difficult for program to articulate.	Continue to refine performance measures that support the goals of the program; encourage frequent independent evaluations to include those initiated by DOD.
Yucca Mountain Nuclear Waste Repository	Adequate	The program has strong purpose and design, but is weaker on strategic planning and management.	Complete a Capital Asset Management Plan and certify the Earned Value Management System.
Building Technologies	Adequate	The program needs to improve on focusing on longer-term, higher risk R&D; and methods for assessing program benefits.	Develop a consistent framework for analyzing costs and benefits of R&D investments.
NNSA—Elimination of Weapons Grade Plutonium Production (EWGPP)	Results not Demonstrated	EWGPP is a new program that does not yet have a track record; the program possesses solid, tangible performance measures.	Evaluate possibility of reallocating funds to reflect a funding profile more consistent with a construction project; review lessons learned from other nonproliferation efforts in Russia to mitigate risk.

The Department of Energy is one of 12 major R&D agencies that plan, manage, and assess their R&D programs consistent with the R&D Investment Criteria. DOE has been a leader in the Federal Government in using the criteria, including being the pilot agency for application of the criteria to its applied research programs in 2001. This year, DOE assessed 23 R&D programs using the PART. DOE made substantial progress developing program performance measures and this year has long-term and annual measures for nearly all of the R&D programs assessed through the PART. To better inform budget decisions, DOE’s applied R&D programs will continue to improve methods for estimating the potential public benefits of its programs and activities. Further discussion on the implementation of the R&D Investment Criteria at DOE and across the Federal Government is included in the Research and Development chapter in the *Analytical Perspectives* volume.

UPDATE ON THE PRESIDENT’S MANAGEMENT AGENDA

The table below provides an update on the Department of Energy’s implementation of the President’s Management Agenda as of December 31, 2003.

	Human Capital	Competitive Sourcing	Financial Performance	E-Government	Budget and Performance Integration
Status	●	●	●	●	●
Progress	●	●	●	●	●

The Department of Energy is linking managerial performance appraisals to performance and working to identify and fill gaps in areas where it is lacking workforce skills and competencies under its comprehensive human capital management plan. DOE intends to have more than 60 percent of appraisals linked to performance targets by 2005. DOE has a comprehensive competitive sourcing plan and has completed two competitions. DOE has five additional comprehensive services studies underway covering 1,159 Federal and about 1,000 contract positions, which are scheduled to be completed by December 2004. DOE issued its 2003 financial statements with a clean audit opinion and no material internal control weaknesses. In 2004, DOE began conducting quarterly control reviews for all major information technology investments, assessing actual progress against cost, schedule and performance targets. DOE also improved the linkage between program resources and performance in its 2005 Budget and completed PARTs covering over 60 percent of its program funding.

DEPARTMENT OF ENERGY
(In millions of dollars)

	Actual		Estimate	
	2001	2003	2004	2005
Spending				
Discretionary Budget Authority:				
National Defense				
National Nuclear Security Administration.....	6,895	7,985	8,671	9,049
Other Defense Activities	570	513	671	665
Energy Resources.....	2,448	2,629	2,708	2,664
Science and Technology	3,202	3,296	3,484	3,432
Environmental Management	6,436	6,951	7,061	7,434
Nuclear Waste Disposal.....	314	457	577	880
Corporate Management and all other purposes	160	128	118	196
Total, Discretionary budget authority (gross)	20,025	21,959	23,290	24,320
Legislative Proposal: Reclassify Nuclear Waste Fund receipts.....	—	—	—	-749
Total, Discretionary budget authority (net) ¹	20,025	21,959	23,290	23,571
Total, Discretionary outlays (net).....	18,469	21,628	22,850	23,968
Mandatory Outlays:				
Existing law	-766	-1,796	-1,357	-1,371
Legislative proposal	—	—	—	749
Total, Mandatory outlays	-766	-1,796	-1,357	-622
Total, Outlays	17,703	19,832	21,493	23,346

¹ For comparability, the 2001 data reflect transfers related to the creation of the Department of Homeland Security.