



U.S. DEPARTMENT OF **ENERGY**

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United States Department of Energy A Brief Background and List of Major Accomplishments

“The rich history of the U.S. Department of Energy traces back to the Manhattan Project and a host of energy-related programs that were once overseen by various agencies throughout the Federal government. Over time, the missions and responsibilities of the predecessor agencies and programs evolved and expanded to shape the modern day Department. Established in 1977, the Department is responsible for advancing the national, economic, and energy security of the United States; promoting scientific and technological innovation in support of that mission; and ensuring the environmental cleanup of the national nuclear weapons complex.

“Our foundation lies in solving the Nation’s greatest problems, answering the Nation’s greatest challenges, and ascending science’s greatest heights. Our nation-wide complex of national laboratories and production facilities establishes the Department as the world’s premier facilitator of scientific creativity, innovation, research, and development. As the Nation’s 11th Secretary of Energy, I am honored to lead this Department’s talented and dedicated employees and contractors. Our internationally recognized team is comprised of the best and brightest minds in the Federal government. Working together, the Department’s complex-wide cadre of professionals is discovering the solutions to power and secure America’s future.”

- Samuel W. Bodman, U.S. Energy Secretary

By the Numbers

- FY 2009 Presidential Budget Request is approximately \$25 billion
- Approximately 115,000 employees (federal government employees and contractors)
- 17 National Laboratories and 4 weapons plants and a test site
- 4 Power Marketing Administrations (BPA/WAPA/SEPA/SWPA)
- Over 80 Nobel Laureates affiliated with DOE and predecessor agencies
- 7 of top 10 computers in the world affiliated with DOE (Top 500 List)

Energy Security

• **TEAM Initiative.** DOE announced the Transformational Energy Action Management (TEAM) Initiative in 2007 to implement the President's Executive Order 13423 and reduce energy intensity across the nationwide DOE complex by 30%, saving a resulting \$90 million in taxpayer money per year. This program is being promoted as a model across the Federal government, with \$1.5 billion in ESPC (Energy Savings Performance Contract) investment currently in the pipeline.

• **Technology Commercialization.** Over the past four years, DOE has strengthened its Commercialization program and increased its engagement with the venture capital community using a three-pronged approach:

- The Entrepreneur in Residence Program (EIR), which partners with venture capital firms to send entrepreneurs into the national labs to identify technologies for commercialization;
- The Technology Commercialization Fund, which provides pre-venture capital funding for activities such as prototype development, demonstration projects, and market research;
- The Technology Commercialization Showcase, which provides a forum for DOE programs to demonstrate their most promising technologies to potential industry investors.

Through these efforts, DOE is bringing laboratory-developed technologies into the commercial marketplace in a quicker and more cost-effective manner, thereby having a more immediate impact on the taxpayer.

• **Loan Guarantees.** DOE has committed to spur industrial efforts to move clean energy production technologies to market through loan guarantees that support innovative investment. DOE will provide up to \$42.5 billion for projects that employ advanced technologies that avoid, reduce, or sequester emissions of air pollutants and greenhouse gases.

• **Wind Power.** The Administration has supported advancements in development and deployment of this key emissions-free source of power to address climate change and improve our energy security. 88% of our domestic wind capacity has been installed since President Bush took office in 2001, and the U.S. has had the fastest growing wind power capacity buildup in the world for the last 3 years in a row. In 2007, the U.S. installed more wind generation capacity than any other country by bringing on-line 5 GW of new wind installations.

• **Solar America Initiative (SAI).** SAI is a Presidential Initiative launched in 2006 that seeks to make solar electricity from photovoltaics (PV) cost-competitive with conventional forms of electricity by 2015. Under this Initiative, the Solar Technologies Program budget doubled to \$160 million, providing funding for solar research across the entire value chain and leveraging \$400 million in multi-year industry cost-share research. DOE efforts have helped to significantly reduce the cost of solar photovoltaic modules.

• **Biofuels Initiative.** Under the President's Biofuels Initiative, DOE has established 13 commercial and demonstration scale cellulosic biorefineries. These biorefineries and other

innovations supported by DOE represent substantial progress toward achieving cost-competitiveness of cellulosic biofuels by 2012. Under the President's leadership, the U.S. has experienced record growth in the ethanol industry from 2001-2008. At the end of 2007, the U.S. produced 6.5 billion gallons per year of ethanol – up from 1.6 billion gallons in 2000; this resulted in the displacement of 228 million barrels of oil. For the past three years the U.S. has led the world in ethanol production. The number of ethanol plants has more than tripled from 2000 – there are currently over 177 operating ethanol plants, up from 54 in 2000. The U.S. is now adding 1 billion gallons of new ethanol production capacity per year. There are now roughly 7 million flexible fuel vehicles on the road, with close to 1 million of those sold in 2007.

- **Renewable Fuels Standard.** Inspired by the President's "20 in 10" Initiative, Congress codified a Renewable Fuels Standard (RFS) and updated CAFE requirements in the 2007 Energy Security and Independence Act. The new RFS calls for the nation to gradually increase its use of renewable transportation fuels and meet corresponding greenhouse gas reduction requirements, such that 36 billion gallons be used annually by 2022.

- **Advanced Vehicle Technologies.** Under DOE's plug-in hybrid vehicle (PHEV) program, battery R&D increased from \$1.4 million in 2006 to \$25.1 million in 2008. This effort also led to the creation of a demonstration program for vehicle performance, infrastructure usage, and requirements data. DOE is partnering with industry to develop and demonstrate cost-competitive plug-in hybrid electric vehicles that are capable of traveling up to 40 miles without recharging. The cost of battery packs for hybrid vehicles has been reduced from \$1500 in 2002 to \$625 in 2008, improving the cost competitiveness of hybrid vehicles. In 2001, there were 1.2 million flexible-fuel vehicles on the road – today there are about 7 million. During the Bush Administration, the U.S. has seen exponential growth in E85 fueling stations: 154 fueling stations in 2001 and as of October 2008, there are 1,676 fueling stations across the country offering E85.

- **Hydrogen Fuel Initiative.** Under the President's Hydrogen Fuel Initiative, \$1.2 billion was invested over five years to accelerate research, development and demonstration of hydrogen and fuel cell technologies in transportation and electric power applications. This boost in R&D funding led to a reduction in the projected high-volume cost of automotive fuel cell systems from \$275 per kW in 2002 to \$73 per kW in 2008, doubled fuel cell durability from 1,000 to 2,000 hours, and accelerated near-term hydrogen commercialization opportunities for stationary fuel cells and specialty markets such as forklifts and back up power.

- **Increasing Energy Efficiency.** During this Administration, under the Buildings Technology Program, DOE helped create technologies and system design approaches that enable net-zero energy buildings at low incremental cost by 2025 and net-zero energy homes by 2020. DOE has worked with industry partners to increase the energy efficiency of homes by 40 percent. Launched in 2005 as part of President Bush Initiative "Easy Ways to Save Energy," the Department launched a program activity targeting the nation's most energy-intensive industrial plants. As of November 1, 2008, the Department has completed 650 assessments, with 525 plants reporting total potential natural gas savings of about 80 trillion Btu — the equivalent of natural gas consumed by more than 1 million single-family homes per year, and potential carbon

dioxide (CO₂) emissions reduction of about 7 million metric tons — the equivalent of removing nearly 1.3 million cars off the road.

- **Deploying Clean Energy.** The Department has provided best practice technical assistance to states on clean energy topics such as renewable portfolio standards, demand response, smart grid, and regional planning and coordination. In addition, DOE has facilitated regional planning in the West to identify the areas with the most promising renewable resources and determine what new transmission facilities are required. Since 2005, DOE and the Environmental Protection Agency have been jointly implementing the National Action Plan for Energy Efficiency to help lower the growth in energy demand across the country by more than 50 percent, and shows ways to save more than \$500 billion in net savings over the next 20 years. These strategies, if implemented, are estimated to help reduce annual greenhouse gas emissions equivalent to those from 90 million vehicles.

- **Clean Coal Power Initiative (CCPI).** CCPI provides government co-financing for new coal technologies that can help utilities meet the President's Clear Skies Initiative to cut sulfur, nitrogen and mercury pollutants from power plants by nearly 70 percent by the year 2018. The Second Round of CCPI projects focused on technologies applicable to Integrated Gasification Combined Cycle (IGCC). A CCPI Third Round solicitation is presently underway which seeks to demonstrate coal technologies that sequester or beneficially reuse CO₂.

- **FutureGen.** The restructured FutureGen approach is designed to develop commercial-based experience in integrating CCS with multiple coal power plants. This initiative builds on the Administration's investment of more than \$2.5 billion in clean coal technology since 2001, which includes small-scale carbon sequestration projects and IGCC research that have advanced our understanding of the potential for clean coal technology.

- **Regional Carbon Sequestration Partnerships.** These partnerships provide a nationwide network of federal, state, and private sector partnerships to determine the most suitable technologies, regulations, and infrastructure for future carbon capture, storage and sequestration in different areas of the country. The Regional Carbon Sequestration Partnerships Initiative is working to build the infrastructure and demonstrate that the storage of carbon dioxide in deep geologic formations is an economical and safe technology option to reduce greenhouse gas emissions from coal fired power plants in the United States. In 2007, the Regional Partnerships began a program of eight near-commercial scale storage demonstration projects (at least 1 million tons of carbon dioxide) in deep geologic formations.

- **Methane Hydrates.** It is now estimated that methane hydrate in both arctic and marine settings may contain more energy than all the world's coal, oil, and non-hydrate natural gas combined. The magnitude of this previously unknown global storehouse of methane is truly staggering and has raised serious inquiry into the possibility of using methane hydrate as a source of energy that would transition us to a renewable energy future. Our arctic testing results clearly showed the ability of the formation to yield gas from gas hydrate through pressure reduction. These results are being advanced to provide the first extended production testing of a U.S. gas hydrate reservoir. DOE is currently collaborating with other countries, including Japan,

India, Korea, and China to develop the knowledge and technology base to allow commercial production of gas from domestic hydrate deposits by the year 2015.

• **International Energy Partnerships.** Two flagship partnerships that the U.S. has actively promoted are the Asia Pacific Partnership (APP) and the Carbon Sequestration Leadership Forum (CSLF). Under the APP, outstanding collaboration has been forged between a number of public and private sector organizations in the seven APP member countries (Australia, Canada, China, India, Japan, Korea, and the United States) for efficiency improvement in existing coal-fired power plants. Under the initiation and leadership of the United States, the Carbon Sequestration Leadership Forum (CSLF) was founded as a Ministerial-level international initiative for collaboration on Carbon Capture and Storage (CCS). At its inception in 2003, the CSLF had 14 members, including 13 countries and the European Commission. The CSLF has since grown to 22 members throughout the world, including both industrialized and developing countries.

• **Nuclear Power 2010 Program (NP2010).** The Department led the way for construction of new nuclear power plants by establishing the NP2010 Program, a cost shared program with industry to demonstrate the untested regulatory process for new plants and to make the next generation of nuclear power plants ready for construction by completing their detail designs. The NP2010 Program has resulted in three Early Site Permits approved by the Nuclear Regulatory Commission (NRC), the submission by industry of 17 Construction and Operating License applications to NRC, and the certification of 2 reactor designs with 4 more under review.

• **Yucca Mountain.** On June 3, 2008, the Department submitted a license application to the U.S. Nuclear Regulatory Commission (NRC) seeking authorization to construct America's first repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain, Nevada. Currently, the waste is stored at 121 temporary locations in 39 states across the nation. The submittal of the license application was the culmination of more than two decades of expert scientific research and engineering. NRC accepted (docketed) the application on September 8, 2008, beginning a rigorous review process to confirm that the Yucca Mountain repository will provide for the safe disposal of spent nuclear fuel and high-level radioactive waste and will be protective of human health and the environment now and into the future.

• **Standby Support Program.** The Department implemented the Standby Support Program in 2006 that provided delay risk insurance for certain regulatory and litigation related delays for new nuclear plants. The program is one of three financial incentives included in the Energy Policy Act of 2005; the Department has received two responses by utilities interested in receiving one of the six contracts the Department is authorized to sign for new nuclear power projects.

• **Global Nuclear Energy Partnership (GNEP).** In the face of increases in demand for energy resources worldwide and in response to growing concerns for carbon dioxide emissions, the world has begun a substantial expansion of nuclear power. To address this expansion, President Bush launched the highly successful Global Nuclear Energy Partnership. Internationally, GNEP has provided a statement of principles accepted by 25 nations actively working in partnership to ensure that the growth in worldwide nuclear energy can take place without requiring

technologies that would increase the risk of nuclear weapons proliferation. Domestically, the Advanced Fuel Cycle Initiative has put in place international cooperative research agreements with four other fuel cycle nations and developed advanced technologies at national laboratories, universities, and with industry that will make the United States less dependent on foreign sources of fuel, diversify our supply, simplify management of used nuclear fuel, and reduce the long-term effects of its disposition.

- **Strategic Petroleum Reserve (SPR).** The SPR is a critical component of our nation's energy and national security, serving as a key safeguard to protect the U.S. from potential disruptions to our oil supplies. Under this Administration, the SPR has been filled to unprecedented levels and increased its stockpile by over 21% to a current inventory in excess of 700 million barrels. Also at President Bush's has acted vigorously to implement the legislative mandate to strengthen this national asset through expansion of the reserve to a fifth site in Mississippi and increasing the capacity of two existing sites. These expansion activities would strengthen this asset to a total capacity of 1 billion barrels. This type of protection has enabled the government to be better prepared than ever before to deal with disruptions from hurricanes or other potential threats to our oil supplies, as evidenced by the SPR's use in response to Hurricanes Katrina, Rita, Ike, and Gustav.

- **Electricity Infrastructure.** The Department has taken significant measures to improve the security of our energy infrastructure. The Department conducted test bed and on-site field vulnerability assessments of 15 control systems and for control system component technologies. As a result, control system vendors have developed six next-generation "hardened" systems—of which some have been deployed in the marketplace. DOE has also used cutting edge research and technology development to modernize and increase the efficiency in our nation's aging electricity infrastructure. The Department has energized three high temperature superconducting cables (two in New York, one in Ohio).

- **National Interest Electric Transmission Corridors.** The Energy Policy Act of 2005 authorized the Secretary of Energy, after issuing a transmission congestion study for public comment, to designate certain geographic areas as National Interest Electric Transmission Corridors (National Corridors) if appropriate. In October 2007, following consultations and opportunities for public comment, DOE designated two National Corridors: the Mid-Atlantic Area National Corridor which includes all or portions of eight mid-Atlantic States and the District of Columbia; and the Southwest Area National Corridor, which includes portions of southern California and Western Arizona.

- **Energy Response and Emergency Restoration.** Since 2003, the Department has responded to eight major hurricanes (e.g., Rita, Katrina, Ike) providing a team of energy experts to assist in response and restoration efforts. DOE further improved and broadened the capability to better prepare and respond to energy emergencies by establishing an Energy Response Center (ERC), thereby enabling DOE to not only maintain appropriate situational awareness prior to and during a disaster, but also to provide the Department with a mechanism to coordinate all energy response and restoration efforts with our federal, state, local and industry partners.

National Security

• **Weapons Activities.** The Department of Energy, through NNSA, demonstrated the success of the Stockpile Stewardship Program (SSP) by assessing and certifying to the President that the current nuclear weapons stockpile is safe, secure, and reliable. NNSA also completed the reduction of the Nation's nuclear weapons stockpile by nearly 50% from 2001 levels, five years ahead of President Bush's target date of 2012, and greatly increased the dismantlements of retired weapons. NNSA completed life extension and refurbishment activities for two families of warheads (W87 and B61), produced the first replacement plutonium pit in 18 years for a nuclear weapon, and restored national capability to manufacture tritium. Each of these accomplishments helps ensure the Nation's aging nuclear weapons stockpile is capable of meeting national defense requirements without conducting underground nuclear tests. \

• **Securing Dangerous Materials.** Over the past few years, the Department of Energy, through, the NNSA, achieved astounding successes critical to improving our national security: converted 57 nuclear reactors in 32 countries from highly enriched uranium (HEU) to low-enriched uranium; verified the shutdown of 4 HEU-fuel reactors in 3 countries; returned for safe and secure storage 765 kg (over 30 weapons-worth) of Russian origin HEU, 1,196kg (over 45 weapons-worth) of U.S. HEU, and over 145kg (more than 5 weapons-worth) of other HEU material; secured over 730 vulnerable radiological sites overseas and recovered over 18,700 radiological sources domestically; successfully repacked and removed 550MT of uranium and 4,000 curies of radiological sources from the Tuwaitha Nuclear Research Complex in Iraq.

• **Detection and Deterrence of Illicit Materials Trafficking.** In 2006, an agreement was reached between the United States and Russia to equip all of Russia's border crossings (350 sites) with radiation detection devices by 2011 (6 years ahead of schedule), building on the 160 crossings NNSA had already equipped. In addition, NNSA achieved the operation of Megaports' radiation detection equipment in 19 countries with work underway in the ports of 20 other countries and Taiwan, and further completed the installation of radiation detection equipment at 53 border crossings in 12 countries. NNSA also, established a strategic partnership with the U.S. Central Command for interdiction and border security capacity building across the Middle East.

• **Eliminated Weapons-Usable Material.** Under President Bush's leadership, the NNSA has led the downblending of over 350 MT (14,000 weapons-worth) of former Soviet weapons-origin HEU for use in commercial U.S. nuclear power plants, providing 10% of U.S. electricity annually; converted almost 15 MT (560 weapons-worth) of Russian non-weapons excess HEU into LEU, thereby diminishing the threat of proliferation or nuclear terrorism; downblended over 100 MT (approximately 4,000 weapons-worth) of surplus U.S. HEU into LEU for peaceful use as nuclear reactor fuel, with an additional 15 MT (600 weapons-worth) packaged and shipped for downblending; and ended 43 years of weapons-grade plutonium production at Seversk by shutting down two reactors, eliminating nearly a ton of weapons-grade plutonium production annually.

• **Plutonium Management and Disposition.** NNSA advanced U.S. and Russian programs to dispose of at least 34 MT each (8,500 total weapons-worth) of weapons-grade plutonium. In

2007, negotiated and reached agreement with the Russians on a technically and financially credible approach for the Russians to fulfill their end of the Plutonium Management and Disposition Agreement (PMDA). The U.S. and Russia began negotiations on an amended PMDA to reflect this approach in May 2008. In addition, consistent with the PMDA, NNSA has been building its Mixed Oxide Fuel (MOX) Fabrication Facility at the Savannah River Site for over a year, with the total project over 25% complete. Finally, in 2007, the U.S. declared an additional 9 MT (1,125 weapons-worth) of weapons-grade plutonium excess to our national security needs, which is also available for fabrication into MOX fuel.

- **Non-Proliferation.** Strengthened and expanded international nonproliferation efforts through work with the U.S. State Department in the dismantlement and subsequent removal of Libya's nuclear weapons program and the responsibility for leading the disablement efforts of North Korea's Yongbyon nuclear facilities through a continuous on-the-ground monitoring presence. Additionally, NNSA has engaged thousands of former weapons scientists and engineers and technicians at over a 180 facilities in the former Soviet Union, as well as hundreds more in Libya and Iraq, at core sites, helping to redirect their expertise to civilian pursuits; since 9/11, training over 900 U.S. Customs and Border Patrol inspectors, nearly 6,400 domestic, and over 11,000 international export control officials on weapons of mass destruction (WMD) awareness, over 250 foreign officials annually on how to physically protect nuclear materials and facilities, and over 1,300 foreign facility operators on nuclear material control and accounting procedures; provided key technical and policy assistance in the negotiation of the U.S.-India Civil Nuclear Cooperation Agreement and in securing consensus support in the Nuclear Suppliers Group; facilitated the creation of an International Nuclear Fuel Bank with the IAEA by contributing \$50M; strengthen the International Safeguards regime by creating and successfully kicking off the Next Generation Safeguards Initiative (NGSI); and demonstrated leadership within the nuclear nonproliferation regime by preparing the DOE Complex for entry into force of the IAEA Additional Protocol to the U.S./IAEA voluntary offer safeguards agreement.

Environmental Responsibility

- **Environmental Cleanup.** DOE completed environmental cleanup at 15 sites nationwide. Among these sites were Rocky Flats, Colorado, which produced plutonium triggers for atomic weapons and was closed nearly 40 years earlier than planned; and the former uranium processing plant in Fernald, Ohio, which was completed 12 years ahead of schedule and \$7.8 billion below the original cost estimate. Both sites are now wildlife preserves.

- **Stabilization and consolidation of the nation's plutonium stockpile.** Prior to 2001, excess weapons-grade plutonium and other materials such as enriched uranium were stored at several sites across the country, posing a threat to both the environment and national security. Since then, the excess plutonium has been stabilized and placed in safe, long-term storage containers. Additionally, this plutonium is being consolidated at a single site – Savannah River, SC – reducing costs and security risks. Moreover, excess plutonium is now destined to be converted into commercial nuclear reactor fuel, serving both global non-proliferation and energy objectives.

• **Safe Storage of Spent Nuclear Fuel.** The Department manages an inventory of more than 250 spent fuel types, which are required by law to be permanently disposed by deep geologic burial. Much of this fuel was being stored in aging water-filled basins at risk of leaking and contaminating underlying soil and groundwater. The Department of Energy has moved much of this fuel into dry storage, allowing wet storage basins to be closed. Today, nearly all the Department's spent nuclear fuel is safely stored in a dry configuration.

• **Operation of a Deep Geological Repository (WIPP).** The Department of Energy is demonstrating that a deep geological repository can be a safe and effective disposition path for nuclear waste. The law requires that all waste contaminated with elements heavier than uranium (such as plutonium) be isolated from other waste. Since 1999, more than 60,000 square meters of this waste has been permanently disposed of at the Department's Waste Isolation Pilot Plant in Carlsbad, NM. Beginning in 2007, WIPP began to dispose of shipments of the most highly radioactive form of this waste.

• **Liquid Waste Challenge.** More than 80 million gallons of radioactive liquid waste remains stored in more than 200 underground tanks. Since 2001, construction has begun on three treatment plants in Idaho, South Carolina, and Washington State that will allow the waste to be converted into a stable glass form and prepared for permanent disposal.

Scientific Discovery and Innovation

• **Taking the Lead in Science and Research.** DOE provides more than 40 percent of total funding for science and research in the United States – a vital area of national importance. The Office of Science High Performance Computing program has moved the Department of Energy to a position of leadership in open scientific computing.

• **Supercomputing.** Over the past 30 years, the Department of Energy's (DOE) supercomputing program has played an increasingly important role in scientific research by allowing scientists to create more accurate models of complex processes, perform simulations of phenomena at a level once thought to be impossible, and to analyze the increasing amount of data generated by large-scale scientific experiments. To enable U.S. research communities to fully tap into the capabilities of current and future supercomputers, the Office of Science launched the Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program in 2003.

• **Bioenergy.** The Office of Science has competitively awarded and established three Bioenergy Research Centers, with an investment of \$25 million each per year, over five years. These Centers are performing cutting-edge basic research to advance understanding and optimization of both biomass energy feed stocks and innovative approaches to converting those biomass feedstocks into renewable fuels.

• **Discovering the Universe.** The U.S. Department of Energy (DOE) and the National Science Foundation (NSF) invested a total \$531 million in the construction of the Large Hadron Collider (LHC) accelerator and associated detectors—located at the CERN laboratory near Geneva, Switzerland—which scientists believe could lead to extraordinary discoveries about the physical

nature of the universe. The first circulating beam was initiated in September 2008, a major accomplishment on the way to the ultimate goal: high-energy beams colliding in the centers of the LHC's particle detectors. Beyond revealing a new world of unknown particles, the LHC experiments could explain why those particles exist and behave as they do and could reveal the origin of mass, shed light on dark matter, uncover previously hidden symmetries of the universe, and possibly find extra dimensions of space.

- **Leading the U.S. Climate Change Program.** DOE's Office of Biological and Environmental Research provides world-class scientific leadership in climate-related modeling, atmospheric sciences and ecosystem research to support effective energy and environment decision-making. DOE is a lead agency in the interagency U.S. Climate Change Science Program with representation in most interagency working groups. DOE-supported scientists played key roles in the previous Intergovernmental Panel on Climate Change (IPCC) Assessment Reports, which were related to the award of the 2008 Nobel Peace Prize to the IPCC.

- **The Earliest Moments after the Big Bang.** Scientists utilizing the Relativistic Heavy Ion Collider (RHIC) at the Brookhaven National Laboratory have found compelling evidence for a new form of matter, the quark-gluon plasma (QGP), believed to have existed during the first microseconds of the Universe. Surprisingly, the QGP appears to resemble a liquid with almost no viscosity, in contrast to the gas that was expected. Upgrades underway at RHIC will increase its capabilities by a factor of ten and enable researchers to fully characterize this unusual state of matter and better understand the early Universe.

- **American Competitiveness Initiative.** Recognizing the critical importance of science and technology to America's long-term competitiveness, and building on previous efforts, President Bush introduced the American Competitiveness Initiative, an aggressive, long-term approach to keeping America strong and secure by ensuring that the United States continues to lead the world in science and technology.

- **Nanoscale Science Research Centers.** These scientific user facilities provide the Nation's research community with world-class resources for the synthesis, processing, fabrication, and analysis of materials at the nanoscale.

- **Fusion Energy Research.** Located in Cadarache, France, ITER brings together an unparalleled partnership including the EU, Japan, China, Russia, South Korea, India and the U.S. Fusion power has the potential to provide abundant, cheap and environmentally benign power for the entire world, starting around mid century. ITER, if successful, will provide insights into what is needed to drive a large-scale fusion burning plasma will form the scientific basis for building a working demonstration fusion power plant.

- **The Spallation Neutron Source.** The Spallation Neutron Source is an accelerator-based neutron source located at the Oak Ridge National Laboratory. When at full power, this one-of-a-kind facility will provide the most intense pulsed neutron beams in the world for scientific research and industrial development. Neutron-scattering research underpins advances in a broad range of materials, such as those used in pharmaceutical applications, food processing, and the manufacturing of electronics, and cars and airplanes. Neutron research also helps scientists

improve materials used in a multitude of technologically important products, such as high-temperature superconductors, powerful lightweight magnets, aluminum bridge decks, and stronger, lighter plastic products.

Management Excellence

- **Technological Advancement.** DOE strengthened information technology management through consistent execution of robust information technology (IT) Capital Planning and Investment Control oversight and reporting processes designed to ensure successful investment performance. Results include a reduction of projects on OMB's watch list from 12 to zero since FY2007 and the implementation of the single Federal IT infrastructure in DOE which has achieved a cost avoidance of over \$90 million since 2006, and is estimated to result in an additional \$200 million in cost avoidance or savings over the next four years.
- **Asset Accountability.** DOE improved financial performance in project management. Over the last three years, the Department has completed 76 percent of its capital asset construction projects on cost and within scope compared with according to the Government Accountability Office about 35 percent between 2002 and 2007. The Department's improved performance on project management has resulted in part from the increased use of Earned Value Management (EVM) systems that objectively monitor the accomplishment of work and provide early warnings of performance problems. Currently, 76 percent of the Department's capital asset projects totaling approximately \$50 billion of the Department's project portfolio have earned value management systems that are certified as being in compliance with national standards.
- **Addressing the Management Challenges of an Aging Workforce.** Enhanced outreach and recruitment strategies, including a new DOE Jobs web page and a corporate career intern program, and implemented a comprehensive talent management system – Leadership and Management Plan to Succeed – designed to ensure the DOE has a continuous supply of internal and external candidates to continue to fulfill the Department's mission for years to come.
- **Procurement Improvements.** In FY 2007, the Department of Energy led the Federal government in the percentage of contracting dollars awarded through competition. Eighty-five percent or \$19.26 billion of contract dollars were competed. The Department also deployed DOE-wide corporate Strategic Integrated Procurement Enterprise System, which replaces and consolidates as many as 30 procurement-related systems across the Department. DOE also issued revised contracting authority that raised delegation levels from an average of \$15 million per site to \$50 million for major DOE contracting offices, an increase of over 200 percent. Additionally, DOE completed a comprehensive Root Cause Analysis of contract and project management deficiencies in April 2008 and approved a Corrective Action Plan in July 2008.
- **Enhancing the Health and Safety of the DOE Workforce.** During the past 8 years, DOE has cut its worker injury and illness rates by more than 50%. This is due primarily to increased management attention, focused contractor incentives, and the collective efforts of the DOE community to apply major safety programs and initiatives, such as our efforts to revitalize the

DOE integrated safety management program, the development and implementation of the Department's first comprehensive worker health and safety rule.

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