FY 1996 Congressional Budget Request

Budget Highlights

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Hazel R. O'Leary
Secretary of Energy

by
MASTER

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Department
of
Energy

Chief Financial Officer

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Policy Overview

Introduction

The Department of Energy provides vital services to the Nation in preserving our National security, advancing U.S. leadership in science and technology, and building a sustainable energy future. At the same time we are engaged in the largest environmental cleanup in the Nation's history. At DOE, we are focused on the way we deliver these services in view of our post-Cold War mission and our obligation to save the taxpayers' hard-earned dollars.

Our Administration believes we should continuously improve government to provide the best, most cost-effective service possible to the American people. Our goal is to shape government to better serve the people.

At the Department of Energy, we have entered into a collaborative effort to strategically align our programs to achieve new and greater efficiencies and savings. The President has pledged to cut taxes for middle-class Americans. Our share of this proposal will be \$14.1 billion including \$8.4 billion in program savings and \$5.7 billion from selling assets over the next five years. We expect to meet this challenge of doing more with less, and we have started by empowering our own employees to tell us how to get the job done. After intensive review, a team of DOE employees will recommend a strategic alignment of the Department to support its core businesses more effectively and efficiently. We expect to present details of our plan for realigning the Department this summer. We have a head start in this exercise: our strategic alignment follows the strategic planning we completed this year.

At DOE, we have already shown that we can reduce costs while improving services. Over the past two years, we have saved \$1.55 billion in contractor salary costs and almost \$300 million on support service contracts. Our contract reforms support the President's Reinventing Government Initiative and will save billions over the next several years as we increase our productivity, particularly in our Environmental Management programs where we expect to save \$4.4 billion over five years. We are aggressively attacking management inefficiencies in our own organization and those of our contractors. We are focusing on our highest priority tasks and lessening our emphasis on the lower priority tasks that are burdening our resources.

Some of the many DOE facilities built to support our critical efforts to win World War II and the Cold War can no longer serve their original function, and we are finding ways they can be of new benefit to the Nation. In all, DOE controls 2.4 million acres of land and 100 million square feet of buildings. The Department is opening more of these resources for economic reuse, energy development, and environmental protection. We are allowing for the creation of a solar facility at our Nevada test site that will cost-effectively provide for the electricity needs of 100,000 people in the Southwest. We are

working with a group of doctors on the possible transfer of a surplus nuclear reactor at our Idaho National Engineering Laboratory that has a potential for treating brain cancer. These are but two of the many ways we are updating the benefits our resources provide to the Nation.

The Department has worked to save taxpayer dollars while improving our services to the Nation, and welcomes this opportunity to examine the plans for Fiscal Year 1996.

Reinventing the Department of Energy

Our Strategic Alignment Initiative

At the Department of Energy, we are undertaking an initiative to strategically align our activities to reflect changing world conditions and changing demands on our science and technology infrastructure. In doing so, we expect to increase our productivity and our service to customers, while realizing savings for the American people. We will be implementing our programs more efficiently through contract and procurement reforms, with fewer layers of management and supervision. We will end redundancies among program offices that in the past have planned and implemented their activities separately. We will propose the privatization or elimination of assets and programs that are no longer critical to the Nation's needs.

The result will be a Department that is more focused on its five business lines: Science and Technology, National Security, Environmental Quality, Energy Resources, and Economic Productivity. DOE will be more streamlined and efficient in its operations. In addition to saving \$8.4 billion in program activities over the next five years, we expect to realize \$5.7 billion in net revenue and savings from sales of assets during this time.

A task force of DOE employees is conducting an intensive four-month review of our activities, seeking to target for elimination redundant or unnecessary work and management layers. We will overhaul or eliminate lower priority programs and identify work that could be better performed elsewhere, inside DOE and out. Meanwhile, an independent, high-level task force is examining the future of the National laboratories and plans to issue its recommendations to the Secretary in February. We plan to incorporate these recommendations into our strategic alignment initiative.

Privatizing Assets

The Power Marketing Administrations were originally established decades ago to provide reliable and affordable electricity to significant sections of the Nation. The Administration believes the purpose for the Federal Government developing and conducting these activities has been achieved and that these functions should now be performed by non-Federal entities. We plan to privatize four Power Marketing Administrations: Alaska Power Administration, Southeastern Power Administration, Southwestern Power Administration, and the Western Area Power Administration. The

proceeds derived by privatizing these assets is estimated at about \$3.7 billion. As we did last year, we are proposing the sale of the Alaska Power Marketing Administration. We propose to sell the other three power marketing administrations in subsequent years, and we will develop a specific proposal for each sale after active and careful consideration with Congress and other interested parties. The proposal will provide customer protection from significant rate increases. Also, we plan to submit legislation to turn the Bonneville Power Administration into a Government corporation.

The Department's Naval Petroleum Reserve in Kern County, California, commonly known as Elk Hills or NPR-1 no longer serves a strategic purpose for the Navy. The Naval Petroleum Reserve was established in the early part of this century to provide the Navy with an ample supply of oil. Although oil was produced during the 1920s and during World War II, the reserve was underdeveloped until the passage of the Naval Petroleum Production Act of 1976 (P.L. 94-258). The Public Law in effect changed the rationale for the program from that of a reserve source of fuel for the military to one of increasing domestic oil production and generating revenues for the U.S. Treasury. The Department believes that the production of oil, gas and other products is not a function of government and is no longer needed for a reserve source of fuel. The FY 1996 Budget proposes to corporatize and sell or lease the government's interest. The sale is expected to produce an estimated \$1.6 billion in net sales receipts in addition to future taxes on profits.

In addition, the Department proposes to sell some of the inventory of natural and enriched uranium that we now control, including highly enriched uranium that the Nuclear Weapons Council has deemed unnecessary to our National security needs. Before the sale, this highly enriched uranium would be blended with natural uranium, so that the material sold would be useful only as an energy source for commercial reactors, not as weapons grade material. Accounting for the costs of blending, processing, safeguarding, and transportation, the material has an estimated net value of at least \$400 million. We will propose legislation to authorize us to transfer ownership of this material to the U.S. Enrichment Corporation which, in turn, could then market the fuel to utilities that operate nuclear power plants.

Improving Our Productivity

Substantial savings can be realized from improvements in the way we manage and control our costs and set our priorities. In the next five years, the Department will save an estimated \$4.4 billion in our Environmental Management program. We propose to achieve these savings by generating a 20 percent productivity increase through improving management and cost controls, reducing overhead costs, and implementing more efficient practices in contractor oversight and contract reform. We will use site-based budgeting to give DOE management and regulators maximum flexibility to allocate resources among site priorities. DOE will continue to administer funding for technology development, the management of special nuclear materials, and certain other initiatives on a centralized basis.

In keeping with this plan, we will improve resource allocation and increase funding certainty for State and Federal regulators by adopting multi-year funding of up to three years by sites where DOE and other parties can agree on a specific plan and budget for that period.

We will work closely with EPA and State regulators to prioritize budgets at each site—a procedure called for by the new three-year budget approach. The reauthorization of Superfund, particularly the land-use provisions in the Administration's Superfund proposal, is critical to these savings.

The Department conducts applied research to develop fossil fuel, nuclear fission and fusion, solar and renewable energy, and conservation technologies. Much of this research is conducted at our National laboratories in conjunction with the private sector. The Department proposes to require more non-Federal cost-sharing of this applied research and development, to better target DOE's spending on efforts for which the private sector predicts the highest potential payoff. We will also curtail or eliminate lower-priority programs of those that are judged to have largely achieved their program objectives. In this latter category, DOE will not commit to more new starts for clean coal projects, because we no longer need to demonstrate or provide substantial financial assistance for the construction and operation of coal-fueled power plants and facilities beyond the 45 already selected. This approach toward the funding and prioritization of our applied research would save an estimated \$1.2 billion in outlays over the next five years.

While the Department has already improved the efficiency of our operations, we can still generate substantial cost savings in how we and our laboratories do business with our customers. Many of these improvements are detailed in the final section of this Policy Overview, entitled "Changing the Way We Do Business." We propose to cut costs by shedding lower priority work, eliminating duplication, and reducing layers of supervision and management. Our Strategic Alignment Initiative, scheduled for completion in April 1995, will amplify these plans. The Initiative will incorporate the work of the Galvin Task Force on the future of the National laboratories. Subsequently, the Department will choose the specific nature of cost reductions and steps. These steps will include a proposal for the private sector to develop and operate energy cogeneration plants at DOE facilities—a concept advocated in the National Performance Review. These efforts to improve our operational efficiency would save an estimated \$2.9 billion over five years.

Providing the Nation with Excellence in Science and Technology

Balancing our Research Portfolio: Program Priorities

In keeping with Administration goals, the Department's budget for FY 1996 emphasizes fundamental research, our energy and environmental missions, and our cost-shared research with the private sector. Fundamental research maintains the Nation's world leadership in science, mathematics, and engineering. Our research in energy and

environmental sciences is paving the way for a more sustainable energy future. Opening our scientific and technological resources to industry will improve the Nation's productivity and economic growth.

Our research in areas critical to long-term National prosperity (such as robotics, alloys, ceramics, fuel cells, building technologies, bioremediation, batteries, biomass and other renewable fuels) is as central to the Department's mission as is our research in high energy physics and nuclear physics. In almost every scientific discipline, our programs provide world leadership by supporting high quality research that is assured by rigorous peer review. Sustaining this effort in FY 1996 ensures the Department's continued contribution to the Nation's economic productivity.

The Department funds the operation of world-class research facilities that are the backbone of the Nation's scientific and technological enterprise. Demand for the use of DOE's accelerators for high energy and nuclear physics research, neutron sources, magnetic fusion facilities, supercomputers, and synchrotron light sources exceeds their availability. Our light sources alone are used by over 3,000 researchers a year for work on semiconductors, polymers, alloys, superconductors, magnetic materials, structural biology, and pharmaceuticals.

Our FY 1996 budget recognizes the importance of fundamental and applied research by supporting a "Scientific Facilities Utilization Initiative." This initiative will immediately benefit the work of thousands of scientists. It will reverse the recent trend toward increasingly scarce operating time and limited availability of our science facilities. In FY 1996, we anticipate completion of the world's most advanced X-ray synchrotron light source: the Advanced Photon Source will provide researchers with a diagnostic beam unsurpassed in intensity by any available today. This advanced light source will contribute to the Nation's research for decades to come.

Advanced Photon Source

The Department's Advanced Photon Source at Argonne National Laboratory is scheduled to begin operations in January 1996. Brilliant x-rays produced by this synchrotron research facility will allow researchers to take images of chemical and biological molecules as reactions take place. Exposure times will be measured in billionths of seconds. "Movies" can be made of catalytic and enzymatic reactions. The facility, to be used by as many as 1,000 scientists each year from industry, academia, and medical schools, will greatly enhance the study of the structure of materials, including high-temperature superconductors and viruses. It will also be used to develop "designer" materials.

Our FY 1996 basic energy sciences budget provides for research and development leading to the conceptual design of a spallation neutron source. We will adopt linear accelerator spallation neutron source technology for scientific use.

The Department invests in a portfolio of research and development partnerships that benefit, and will long continue to benefit, the Nation's economic vitality. We have signed

over 400 Cooperative Research and Development Agreements (CRADAs) with industry in the past two years. Today we provide science and technology to over 1,100 collaborations with the private sector across all sectors of the economy. At the University of Georgia, the Carbohydrates Center we support has analyzed complex chemical structures for over 135 corporations. Our AMTEX partnership with the integrated U.S. textile industry is delivering process innovations that will conserve materials, evaluate fabrics with computer technology, and introduce high-speed cutting. In the Partnership for a New Generation of Vehicles, DOE's Energy Research, Defense Programs, Energy Efficiency, and Fossil Energy programs collaborate with major auto manufacturers on computer modelling of combustion—allowing confident predictions of the emissions that will come from advanced auto engines. Our Domestic Natural Gas and Oil Initiative promises to yield new technologies for making the best use of these National fossil fuel resources. These are but a few examples of our work to offer world-class science and technology to the Nation.

Science for Sustainable Development

Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. It provides for both economic growth and environmental protection. Science for sustainable development is aimed at finding new and improved ways to use resources more efficiently, reduce and control waste in industrial processes, understand and predict global climate change and its consequences, and develop innovative approaches to waste cleanup.

Of the many contributions the Department has made recently to sustainable development, one of the most beneficial is the discovery, after years of research into the theory of alloys, that metallic glass can significantly reduce friction and improve wear in machinery—decreasing energy use, costs, and contamination in the applications ranging from car parts to industrial machinery to airplanes. Likewise, the synthesis of a new resin promises cheaper and more efficient removal of toxic heavy metals and actinides from industrial waste waters. The deployment of the third of three Atmospheric Radiation Measurement sites scheduled for 1997 will make it possible to significantly improve global climate change predictions. These and related programs, including advanced battery research and fusion energy research, are in the forefront of the Department's efforts in FY 1996 to promote economic growth in ways that protect the environment and the Nation's future resources.

Lead-Free Solder

Scientists at the Department's Ames Laboratory have responded to environmental legislation by developing a lead-free solder. The discovery of the new solder alloy, based on tin, silver, and copper, eliminates hazardous exposure to lead-containing vapors in industrial soldering. Johnson Manufacturing of Princeton, Iowa, an ingot and wire manufacturer for the electronics industry, recently licensed the Ames lead-free solder technology. Tests indicate that the new material forms strong joints suitable for major electronic circuit manufacturing operations such as those used in the automobile industry.

Biotechnology: Improving Our Health and Our Environment

The Department has made major investments in research to understand and predict the health and environmental effects of energy production and use. These investments have led, and are leading, to improved protection of workers at DOE facilities and to novel approaches for cleaning up waste at contaminated DOE sites. The Department's research

contributions advance the Nation's biotechnology industry, improving health care delivery and enhancing environmental protection.

Discovery of a Gene for Breast Cancer

DOE-sponsored researchers at the California Institute of Technology have helped locate a gene that contributes to the susceptibility to breast cancer in some women. The gene's malfunction accounts for nearly half of the 10 percent of breast cancers that are inherited. In related research, DOE-funded efforts at the Eleanor Roosevelt Institute for Cancer Research contributed a key step in finding the gene that may be responsible for up to 15 percent of colon cancer.

Our Human Genome Project is at the forefront of the international effort to develop and apply technology that can map and sequence the human genome. Beyond its obvious implications for medicine and human health, this work is providing us with new capabilities in fields of energy, environment, agriculture, materials, and industrial processes.

The Department continues to develop the technology needed to "engineer" and exploit biomolecules such as enzymes, antibodies, and other proteins that can be used in industrial and environmental processes for the conversion of biomass to fuel, increasing agricultural yields, industrial catalysis, and bioremediation. The microbial genome initiative is using these various technologies to characterize and engineer the genomes of microorganisms that function in extreme environments, to produce energy sources and potentially to treat and minimize waste from industrial processes.

Our medical applications research continues to advance the development of new radiopharmaceuticals. The design, synthesis, and labeling of biologically active molecules that can serve as medical probes for diagnostic imaging with Positron Emission Tomography (PET) and Single Photon Emission Computerized Tomography (SPECT) is advancing medical science. These applications will help doctors diagnose disorders and monitor the effectiveness of various treatments.

Refocusing High Energy and Nuclear Physics

Continued U.S. leadership in high energy physics over the next decade requires continued investment in National and international research. On the domestic front, the Department is providing increased funding to assure timely completion of the Fermilab Main Injector and the Stanford B-factory upgrades, as recommended by the High Energy Physics Advisory Panel. On the international front, we are looking to the next generation of high energy physics experiments in considering a U.S. commitment to cooperate with

European nations on building the proposed Large Hadron Collider at CERN. The Large Hadron Collider will give researchers access to new scientific regimes after the turn of the century.

In nuclear physics, the Department will operate the Continuous Electron Beam Accelerator in FY 1996 and will continue construction of the Relativistic Heavy Ion Collider. Following confirmation that the sun's burning process is producing fewer neutrinos than expected, a new joint U.S./Canada nuclear physics detector will begin to search directly for the "missing" neutrinos.

Fusion: The Next Steps

Our research in fusion energy is aimed at developing an inexhaustible energy source for the future. Progress over the past few years—including record-breaking production of fusion energy by our Tokamak Fusion Test Reactor—has brightened the prospects for fusion energy. Evidence continues to mount that the next generation U.S. experiment, the Tokamak Physics Experiment (TPX), will result in an optimized design for a fusion-powered plant, and that the International Thermonuclear Experimental Reactor (ITER) will demonstrate the scientific and engineering feasibility of fusion power. Our FY 1996 budget for fusion funds the start of TPX construction and continues U.S. partnership in ITER, in collaboration with the European Community, the Russian Federation, and Japan.

A World Record in Fusion

Scientists at the Princeton Plasma Physics Laboratory recently set a world record of more than 10 megawatts of fusion power, enough to power more than 2,000 homes if sustained on a continuous basis. The experiments at the Tokamak Fusion Test Reactor are a significant step toward demonstrating the scientific feasibility of fusion power.

The Top Quark

In an ongoing experiment by an international team of 439 researchers at the Fermi National Accelerator Laboratory in Batavia, Illinois, DOE scientists have gained experimental evidence of the existence of the "top quark." This provides verification of the grand theoretical edifice known as the Standard Model of Matter. The top quark is a subatomic particle that is the last undiscovered quark of the six predicted by current scientific theory. This accomplishment is the result of a decades-long effort to identify all the fundamental building blocks of nature.

Harnessing Information Technology

Our high performance computing program is pivotal to the Administration's advancement of the National information infrastructure. In the past two years, we have developed software that reduces from one month to one day the time needed to analyze automobile crash data. Our "parallel virtual machine" concept links hundreds of workstations together to solve problems efficiently. Industry has adopted this approach to attack otherwise intractable computational problems.

A Model for Climate Change

Advances in "massively parallel" supercomputing have enabled scientists to better simulate climate change. Researchers at the Los Alamos National Laboratory, the National Center for Atmospheric Research, and the Naval Postgraduate School are completing development of the first integrated model that couples ocean circulation to state-of-the-science atmospheric models. The model is giving researchers confidence for the first time that accurate predictions of climate change are possible.

In FY 1996, we will promote the integration of these and other successful information protocols, languages, and tools into a new research environment—to allow geographically distributed investigators to see and interact with remote facilities seamlessly as a part of their working world. This same technology will eventually transform science education by linking classrooms to libraries, data bases, museums, and our National laboratories. Students and teachers will then be able to participate in real time experiments with working researchers.

Education: Providing for a Technically Trained Diverse Workforce

The Department leverages its unique scientific and technical resources to improve the Nation's quality of science and mathematics training at all educational levels. Education is the key to maintaining the Nation's leadership in science and technology and workforce skills for the future. The Department supports long-term reform in science and mathematics education and helps sustain the Nation's leadership in academic fields.

National and Regional Science Bowls

For the past four years, DOE has sponsored the annual National and Regional Science Bowls, a nationwide academic competition aimed at heightening interest in mathematics, engineering, technology, and science among American students. The Science Bowls allow students who excel in these areas to demonstrate their knowledge and gain national recognition. Recent Science Bowls have brought together teams from all over the nation, with 15,000 students representing over 3,000 high schools. DOE employees and contractors contribute their spare time as voluntary moderators, judges, and timekeepers for the competition. The Science Bowls have gained the participation of Cray Research Foundation, IBM, and Microsoft, among other companies.

We are designing new educational tools to recapture U.S. preeminence in mathematics and science training, in support of the National Education Goals. The Department is applying National Education Standards criteria to the funding of science and mathematics programs, as we improve our program outreach and diversity.

We are developing strategies to leverage our resources so that we may contribute state-of-the-art education technologies to the Nation's classrooms. In FY 1996, the Department will continue to open channels that make previously unavailable information readily accessible to the public. We will increase the availability of international scientific and technical information that will allow U.S. businesses to become more competitive. In addition, the Department is improving its performance monitoring and decision making systems designed to improve program management and delivery of results.

Managing the Post-Cold War Change in Defense Requirements

Stockpile Stewardship: Maintaining Confidence

The Department is committed to maintaining confidence in the Nation's nuclear weapons stockpile without underground testing. Investments in technologies to replace underground testing and to ensure confidence in the stockpile of enduring nuclear weapons remain high priorities for DOE. The Department's FY 1996 budget request includes increases for new initiatives such as the National Ignition Facility (NIF), the Advanced Strategic Computing Initiative, and the Los Alamos Neutron Science Center (LANSCE). At the same time, the Department will maintain the option of resuming underground testing at the Nevada Test Site.

In October 1994, the Department decided to proceed with the preliminary design and engineering of the National Ignition Facility (NIF), a laser research facility intended to achieve thermonuclear fusion in the laboratory. As a key element in the Department's science-based stockpile stewardship program, the NIF will provide research opportunities that will attract world-class scientists and engineers, thus helping ensure that the Nation's continuing National security challenges will be addressed by experts second to none in the world.

The Department recognizes the challenge of maintaining confidence in the enduring nuclear weapons stockpile as well as maintaining the capability to respond in a timely and cost-effective manner to any new or unforeseen threat to the Nation's security. As such, our science-based Stockpile Stewardship program requires continued use of current facilities and programs, a limited set of new experimental and computational facilities and programs, strengthened integration of all program areas, and periodic review and evaluation of all program elements.

Another part of maintaining our confidence in the stockpile is to ensure an adequate supply of tritium, a radioactive gas that greatly increases the explosive force of weapons in the nuclear stockpile. With a half-life of 12.5 years, tritium must be replaced periodically. The U.S. currently has no production facility for this important commodity and is relying on recycling and dismantlement to meet current requirements. The Department has developed a strategic plan, supported by the Nuclear Weapons Council, to meet long-term tritium requirements.

Dismantling Weapons: Ensuring Safety and Managing Fissile Materials

The Department is carrying out its responsibilities for achieving the National security objectives established by the President. We assist in reducing the global nuclear danger by planning for and maintaining a safe, secure, and reliable stockpile of nuclear weapons and associated capabilities and technologies. DOE places primary importance on safely dismantling nuclear warheads, ensuring the safety of operations, protecting the environment, managing our nuclear weapons complex, and cost-effectively consolidating our nonnuclear manufacturing activities. In support of reductions to the nuclear stockpile, the Department dismantled 1,394 nuclear weapons in FY 1994. As of December 4, 1994, an additional 269 weapons have been dismantled.

Miniature Radar

A miniature "radar on a chip" technology developed at Lawrence Livermore National Laboratory as an offshoot of weapons research, will be sold commercially for \$10 per unit—500 times less than existing radar technology. The miniature radar can "see" through walls, rain, fog, and mud. As a licensee, Amerigon, Inc. of Monrovia, California will use this technology in auto air bags, cruise control systems, and to help drivers "see" their blind spot. Another licensee, Zircon Corporation of Campbell, California will produce stud finders for construction workers. The technology can also be used in home and auto security systems, electronic tools, robotics, and medical instruments.

In keeping with the Finding of No Significant Impact approved in September 1993, our consolidation of our nonnuclear manufacturing capability is well underway. All activities related to nuclear weapons development, production, procurement, surveillance, and testing have ceased at our Mound, Pinellas, and Rocky Flats plants. We are transferring and qualifying 26 activities previously conducted at these sites to receiver sites including the Kansas City Plant, Los Alamos National Laboratory, Sandia National Laboratory, and our Savannah River Site. These transfers will be essentially completed by September 30, 1995. Our FY 1996 efforts will focus on the remaining activity transfers and qualifying production capability at the receiver sites.

As part of our stockpile management program, the Department stores, handles, ships, receives, safeguards, controls, accounts for, and disposes of surplus nuclear materials located at former weapons production facilities, including those at Fernald, Hanford, the Idaho National Engineering Laboratory, the Oak Ridge National Laboratory and Y-12 plant, the Rocky Flats Plant, and the Savannah River Plant.

Worker Retraining and Community Assistance: Redirecting Skills

Workers displaced by the reduced needs for nuclear weapons production are being retrained by the Department. In addition, we are providing assistance to communities adversely affected by the changing mission of our defense production facilities. Our Office of Worker and Community Transition, formed in September 1994, responds to Section 3161 of the National Defense Authorization Act of 1994. Since 1993, the

Department has provided education, training, extended health benefits, early retirement incentives, and career counseling to 8,500 dislocated workers at an average cost of \$26,000 for each worker. We are able to offer these benefits at a lower cost per worker than is typical in the private sector. During the same period, we have provided \$94 million in funding to nine communities to support planning and implementation of impact assistance to offset the affects of the sudden loss of DOE activities. We also provide technical assistance to DOE sites affected by the downsizing of non-defense missions. The Department expects an increased need for these benefits on the basis of the downsizing of DOE programs over the next five years.

Maintaining Naval Reactors

The Department's Naval Nuclear Propulsion program has achieved a worldwide reputation of excellence and safety: U.S. nuclear-powered ships have steamed over 100 million miles without a single reactor accident or nuclear harm to crews, the public, or the environment. We continue to support over 130 operating naval reactors. DOE is developing advanced components for the new attack submarine class, required to maintain the Nation's viable submarine force and industrial base. At the same time, we are deactivating six of eight land-based prototype reactor plants.

Recycling Scrap Metal at Rocky Flats

In December 1993, Secretary O'Leary approved the implementation of the first DOE National Conversion Pilot Project (NCPP) at Rocky Flats. The Pilot Project is based on a proposal from Manufacturing Sciences Corporation to reuse four manufacturing buildings to recycle DOE's contaminated scrap metal for beneficial use. The project will hire 200 workers in Stage II and up to 500 in Stage III. Former Rocky Flats workers are targeted for employment. FY 1995 funding for Stage II has been approved by DOE.

Reducing the Nuclear Danger

Nonproliferation: Assuming Global Leadership

The President has made nonproliferation of nuclear weapons one of the Nation's highest priorities. The United States intends to weave this commitment more deeply into the fabric of our relationships with the world's nations and institutions. DOE is a major participant in the international efforts to prevent the proliferation of nuclear weapons because it is the preeminent agency for providing technological and analytical support to guard against the spread of weapons-usable materials. Events in Iraq and Kazakhstan and situations in other formerly Soviet Nations, North Korea, and other countries have highlighted the importance of this mission. The Department focuses its nonproliferation resources and expertise on five policy prescriptions: 1) secure nuclear materials and expertise in the former Soviet Union, 2) limit weapons-usable fissile materials, 3) establish transparent and irreversible nuclear reductions, 4) strengthen the nuclear nonproliferation regime, and 5) control nuclear exports.

The Department conducts a program of laboratory-to-laboratory cooperation between U.S. nuclear experts and scientists at counterpart facilities and institutes in Russia to improve the protection of and accountability for weapons-grade materials. We assist former Soviet republics in improving their export control systems. DOE develops technologies and systems to detect weapons proliferation, to monitor compliance with nuclear-related treaties, and to prepare for implementing the Comprehensive Test Ban Treaty. For the monitoring of Iraqi facilities and other International Atomic Energy Agency programs, we provide technical support. DOE contributes to National Intelligence Estimates and supports the Non-Proliferation Center in assessing international nuclear activities, including theft and smuggling. We assist the Nation's policy community with such intractable issues as the denuclearization of the Korean peninsula.

Project Sapphire

On November 23, 1994, then secret Project Sapphire concluded with the arrival of approximately 600 kilograms of highly enriched uranium originally from the Ulba Metallurgical Plant in Kazakhstan for safe storage at DOE's Oak Ridge facility in Tennessee. Left over from the Soviet era, the cache of weapons-grade uranium in Kazakhstan had been vulnerable to acquisition by parties who could use it to build weapons of mass destruction. A 27-member team of Department experts, along with approximately 120 tons of equipment, flew to Kazakhstan in early October to repackage the material for safe transport and storage to the United States. The uranium was then transported to Y-12 at Oak Ridge for interim storage until it can be converted to low enriched uranium for use in commercial nuclear power plants in the future.

By the end of FY 1995, the Department will have reduced the overall cost of protecting DOE nuclear weapons, materials, and facilities by 20 percent without increasing risks. We are also declassifying millions of DOE documents while protecting information that has the potential to facilitate the proliferation of weapons of mass destruction.

In FY 1996, we must accelerate our efforts to protect fissile materials and redirect nuclear expertise in the former Soviet Union. The Department will also work to end the civilian production and use of weapons-usable fissile materials through promotion of alternative energy sources, the Reduced Enrichment for Research and Test Reactors (RERTR) Program, and nuclear material purchases. In FY 1996, DOE will confirm weapon dismantlement through inspections and other activities that make dismantlement transparent and irreversible. Among other measures, we will advance nonproliferation: by our efforts in North Korea; by negotiating an international fissile material cutoff convention; by facilitating International Atomic Energy Agency inspections in the U.S.; and possibly by buying nuclear materials from other nations. We must also further decrease the overall cost of protecting DOE weapons, materials, and facilities, and support declassification activities—the openness initiative to which the President and the Secretary are committed.

Ensuring Reactor Safety Abroad

The Department conducts programs designed to reduce the threat posed by the operation of aging nuclear facilities in the former Soviet Union and Central and Eastern Europe and to promote nuclear safety worldwide. We provide technical leadership and expertise to, and coordinate with, international organizations such as the International Atomic Energy Agency and the Nuclear Energy Agency.

One of our initiatives is a program to strengthen the safety culture and improve the operation and physical condition of nuclear power plants in countries operating Soviet-designed reactors. A second initiative is aimed at developing replacement power sources for the three remaining plutonium production reactors in Russia. These programs are carried out in accordance with the priorities set by the Gore-Chernomyrdin Commission on Economic and Technological Cooperation.

A third initiative encourages the shutdown of the Chernobyl nuclear power plant by addressing concerns about safety, replacement power sources, and socio-economic conditions. These initiatives are part of the Administration's policy to support former Soviet Nations as they move toward market economies. Finally, the Department cooperates with countries that have advanced nuclear programs, such as the United Kingdom and Japan, on safety, nonproliferation, and decommissioning.

Nuclear Power Plant Training in Russia

As part of DOE's assistance to host countries improving the safety of Soviet-designed nuclear power plants, power plant operators throughout Russia were trained in the application of a special sealant material. The sealant will minimize radioactive release from a power plant's containment structure in the event of an accident. Plant operators installed the sealant at one power plant. A joint venture is being formed between US and Russian companies to supply the sealant on a commercial basis.

Getting Fissile Materials Under Control

Following the President's initiative to undertake a comprehensive approach to the growing accumulation of fissile material from dismantled nuclear weapons, the Department began efforts to eliminate where possible the accumulation of stockpiles of weapons-usable highly enriched uranium and plutonium. Throughout 1994, the Department coordinated its efforts within an interagency framework, focusing on strengthening the U.S. position in negotiations to extend the nuclear nonproliferation treaty and on advancing U.S. nonproliferation initiatives regarding Russia and other nations.

In 1994, the Department initiated a Programmatic Environmental Impact Statement (PEIS) and related analyses to assess the environmental, technical, National security, and economic impacts of alternatives for long-term storage of all weapons-usable fissile materials, and disposition of weapons-usable fissile materials declared surplus to National defense needs. As a member of the Nuclear Weapons Council, the Department played a significant role in the Council's determination of how much of the Nation's

stockpile of plutonium and highly enriched uranium could be declared surplus to National defense needs.

These decisions will enable the Nation to utilize surplus highly enriched uranium, which can be blended down to low enriched uranium that can be sold as commercial reactor fuel. This will result in reduced stockpiles of surplus fissile materials. The proposed sale of the Department's excess natural and enriched uranium is estimated to return at least \$400 million to the U.S. Treasury. Our efforts will advance U.S. and global nonproliferation interests and improve the cost-effectiveness of the Department's management of stockpiles of surplus fissile materials.

Managing the Cold War's Environmental Legacy

More Than Cleanup

The responsibilities of the Department's Environmental Management program will expand dramatically in FY 1996. In addition to "cleanup" the Environmental Management program is tasked with managing more than 30 metric tons of weapons-usable plutonium, including the necessary safeguards and security, storage facilities and processing facilities. As a result of this new work, the FY 1996 Environmental Management program budget request of \$6.6 billion includes more than \$800 million in transferred authority from other DOE offices for managing thousands of other high-risk facilities located at active defense and non-defense installations.

The Department continues its efforts to remediate the Cold War legacy of contamination at the nuclear weapons complex. Across the Nation, we are treating contaminated waste water, designing new waste treatment facilities, preventing explosions in stored wastes, among other programs. The principle focus of these widely varying activities is to reduce risks in the most cost-effective way possible. We have made progress by working effectively with regulatory agencies and other stakeholders. We have developed new environmental technologies that are now already in use in the private sector. In FY 1996, we will be transferring our management of thousands of our facilities, including the Mound site in Ohio, the Pinellas site in Florida, and two massive reprocessing canyons and five surplus nuclear weapons reactors at Savannah River Site in South Carolina to our Environmental Management program.

Addressing Urgent Risks

In the last two years, we have shifted our environmental strategy toward focusing our limited resources on eliminating the highest risks first. The Department has made substantial progress on remediating the three most urgent risks in the Nations' nuclear weapons complex: 1) potentially explosive underground radioactive storage tanks at Hanford, 2) corroding spent nuclear fuel at several locations, including Idaho and South Carolina, and 3) unstable plutonium stored at the Rocky Flats site in Colorado.

The risk of explosion in the underground high-level waste tanks at our Hanford site in Washington has been virtually eliminated with the use of a state-of-the-art pump that became fully operational during the last year. An experimental pump was installed in the highest risk tank, one of more than a hundred tanks at Hanford that are as large as the Capitol dome. This pump has proved to be so successful that technicians have used it regularly to prevent the buildup of explosive gases within the tank. To avert high-risk problems in several other tanks, the Department added new monitoring capabilities which have enabled engineers to monitor and cool the waste.

The Department has met every deadline in its spent nuclear fuel management program, established in the wake of dramatic findings released in a spent fuel vulnerabilities report issued in December 1993. This report identified serious safety problems with the Department's stored spent nuclear fuel, such as corroding fuel elements, failed storage hangers and racks, and inadequacies in the water basins used to store most of the 2,700 metric tons of spent nuclear fuel now held by the Department.

The Department is addressing a third urgent risk: unstable plutonium. Our Environmental Management program now handles more than 30 metric tons of plutonium at several facilities across the country. In 1994, we identified a number of unsafe conditions at many of these facilities and we are implementing an aggressive program to correct these problems. In one example, plutonium was stored in plastic bags at the Rocky Flats site in Colorado leading to serious corrosion. Using nuclear materials "glove boxes" workers have begun to carefully open each bag and remove the unstable plutonium for roasting in a special oven, thus creating a more stable form.

Our environmental management not only increases safety at our sites, but also reduces the costs of maintaining our facilities by consolidating nuclear materials in fewer buildings, thereby reducing security costs and enabling us to close down old and inefficient buildings. Funding for the newly named "Nuclear Materials and Facilities Stabilization" program is now the second largest part of our FY 1996 Environmental Management request, exceeding the request for our Environmental Restoration program.

Assuming Managerial and Financial Control

For the third year, efficiency improvements are the major management emphasis of our environmental management work. Since 1994, these improvements have resulted in an

Results from Coast to Coast

From California to New Jersey, 69 of the Department's sites in 21 states that were contaminated with uranium mill tailings are being cleaned up by the Uranium Mill Tailings Remedial Action (UMTRA) Program. The UMTRA Program has completed remediation of 13 of 24 uranium mill sites that had been releasing radioactive radon gas, a known cause of lung cancer. The Grand Junctions Projects Office has successfully completed remediation of 99 percent of 4,200 private homes and public buildings with foundations contaminated with uranium mill tailings used as fill and in mixing concrete. In 1994, the primary UMTRA contractor was awarded the National Safety Council's top award for establishing a new national standard for the best safety record in the United States.

annual savings to the Department of more than \$2 billion. For FY 1996, our Environmental Management program has identified savings of more than \$1.3 billion through a combination of productivity savings, contractor employment reductions, and the use of prior year uncosted balances. We are demanding aggressive productivity gains throughout our complex—to be realized without reductions in planned environmental management and cleanup at the sites.

The bulk of productivity savings for FY 1996 are based upon commitments made by individual sites to achieve improved program performance through the allocation of additional Federal employees. Savings expected from this staffing increase will come from reduced indirect costs, increased efficiency through better project management, and reductions in our contractor workforce and related costs as a result of improved Federal management. The Department has developed a systematic approach to identifying and reviewing uncosted balances leading to improved funds management.

Another example of how we are improving our business practices is the reduction of the contractor workforce across the complex. In all cases, these reductions will be in compliance with worker transition requirements using early-out voluntary reductions in force, incentives, attrition, and partial hiring freezes, coupled with an expanded program of retraining. To ensure productivity improvements beyond FY 1996, the Department is recompeting contracts worth more than \$28 billion to implement fee rates based on performance, cost saving incentives, and increased accountability for contractors.

After FY 1996, productivity savings alone will not be sufficient to bridge the widening gap between program needs and expected funding levels. Compliance with environmental statutes remains the highest priority for the cleanup of the Department's weapons complex facilities. Approximately 85 percent of our environmental management budget goes toward compliance with environmental regulations and our agreements with States and the Environmental Protection Agency. In consultation with our stakeholders, we are reconsidering current compliance agreements with States and Federal regulators because of concerns over their cost-effectiveness. While almost 90 percent of FY 1994 enforceable milestones in our compliance agreements were met, a great majority of those comprised studies or reports rather than on-the-ground results. We are working with our regulators to renegotiate compliance agreements as needed in order to stretch out the schedule for performing necessary environmental work. Through these renegotiations, we expect to come up with feasible milestones for FY 1996 that will produce less paper and more results.

Moving from Paper to Progress

Since 1993 the Department has been shifting its resources from unnecessarily prolonged studies to programs which will continue to achieve on-the-ground results in FY 1995 and FY 1996. Under this policy in FY 1994, we completed far more remedial actions and interim remedial actions than we anticipated in setting our original goals: 32 remedial actions instead of 8 and 132 interim remedial actions instead of 29. Our goals for FY 1995

have been raised to 40 completed remedial actions and 166 interim remedial actions. We have safely placed in storage over 500,000 cubic meters of high-level, transuranic, and low-level waste (enough to fill all the boxcars on a train more than 41 miles long) and treated 5 million pounds of radioactive and contaminated mixed waste at the incinerator in Oak Ridge. We have now cleaned and responsibly managed almost 3 billion gallons of contaminated waste water. In FY 1994, additional health and safety professionals were hired to oversee operations and enforce safety regulations. Stringent training and qualifications requirements were established for the Department's employees across the country. As a result, lost workdays at our sites were reduced from 31.1 to 23.2 per 200,000 work hours.

Focusing on Technology Development

Technology development is vital to the long-term success of our environmental management program. We are conducting a variety of applied research projects to develop more effective and less expensive remedies to the environmental and safety problems of the nuclear weapons complex. In FY 1994 the Department demonstrated, on a bench- or full-scale, over 50 new or improved technologies, developed in partnership with the private sector for treating environmental cleanup and waste management problems. We made available for private

Ti-Zeolite for Cleanup

A process developed at the Pacific Northwest Laboratory in Richland, Washington is being used to clean up nuclear waste in New York. At its West Valley Demonstration Project, DOE will safely solidify 600,000 gallons of liquid high-level radioactive waste into glass, using the Ti-zeolite process. Titanium-coated zeolite will separate the radioactive elements from the chemical elements in West Valley's 300 tanks of stored waste. The process makes the waste less hazardous and less expensive to treat. The process for manufacturing Ti-zeolite has been patented and is being marketed by Battelle worldwide.

commercialization 24 new or improved technologies including the Rapid Geophysical Survey and the Hybrid Directional Boring and Horizontal Logging Device. For FY 1995 our technology development program has been restructured and streamlined to focus resources on five major environmental problems: (1) mixed waste characterization, treatment and disposal, (2) high-level waste tank remediation, (3) contaminant plume containment and remediation, (4) landfill stabilization, and (5) facility transitioning, decommissioning, and final disposal. We are increasing our commitment to work with laboratories, universities, other agencies, and private industry to develop environmental technologies which will lower the overall costs of waste characterization and site remediation, while supporting the Nation's technical superiority and economic security.

Safeguarding the Nation's Environment and the Health and Safety of the Public and Our Workers

The Department is committed to making DOE safer by preventing illness, injury, and pollution at our thousands of facilities and in all our programs. In FY 1996 and beyond,

our most serious challenge will be to protect the health and safety of the tens of thousands of workers that participate in the cleanup and environmental restoration of the Department's former nuclear weapons facilities.

Combining the hazards of construction with the health risks of potential exposure to toxic chemicals and radiation, the cleanup poses the most serious health and safety risks faced by U.S. industry. As a legacy of the Cold War, DOE owns and houses the biggest inventory of hazardous materials in the world outside of the former Soviet Union. This inventory includes more than two million kilograms of reactor-radiated materials, tons of plutonium in hard-to-control forms, and enormous quantities of hazardous chemicals, many of which are improperly stored, maintained and tracked.

Conducted in FY 1994, the Department's complex-wide "vulnerability" studies have allowed our program managers to deal with the most serious hazards to workers and the public on a priority basis, allocating personnel and budgetary resources accordingly. Our Independent Oversight office, created in December 1994, will appraise DOE oversight in the areas of nuclear safety, environmental compliance, worker health and safety, and safeguards and security, acting as the Department's "eyes and ears" at our major sites. In FY 1996, the Independent Oversight Office expects to conduct several comprehensive multidisciplinary inspections and single topic reviews.

Bringing Cleaner, Reliable Energy Services to the Global Marketplace

Energy Efficiency: New Technologies and New Partnerships

The Department's energy efficiency and renewable energy programs are founded on the productivity, cost reduction, National security, and environmental benefits of flexible, non-mandatory Federal actions in support of greater efficiency. Our programs in these areas carry out the Department's responsibility under the bipartisan Energy Policy Act of 1992 (EPACT) and other major pieces of authorizing legislation. The benefits of our efficiency and renewable energy programs—to industries, homeowners and commercial firms—can be measured in cost savings, productivity gains, and new high-value jobs created.

In total, DOE's FY 1996 energy efficiency programs are estimated to save homeowners \$17 billion and businesses \$12.5 billion per year by 2005 and to create almost 310,000 jobs. Energy efficiency programs for industry are estimated to save U.S. firms \$5.8 billion annually by 2000. Our transportation technologies are estimated to reduce oil imports by 2.3 million barrels a day by 2000, creating a savings for drivers and improve the balance of trade by \$47 million per year.

We are achieving these benefits by emphasizing voluntary partnerships and cost-shared collaborations with public and private enterprises. Our programs do not emphasize mandates, command-and-control regulations, or the creation of new subsidies and

bureaucracies. Instead, we address the barriers to cost-effective action with carefully targeted and self-eliminating programs.

To date, the Department's Federal Energy Management Program has achieved one-third of Energy Policy Act target energy savings and attracted \$20 million in private investment. The program demonstrates investment in energy efficiency measures primarily in Federal buildings, providing leadership to the Nation and advancing the commercialization of advanced technologies. Most importantly, these Federal activities are saving the American taxpayer millions of dollars in energy costs by providing financial incentives to the private sector to increasingly share in the initial costs of retrofiting Federal facilities and by reforming Federal purchasing practices.

Revolutionary Lighting Technology

In October 1994, DOE unveiled a technological breakthrough in lighting: a powerful Sulfur Light coupled to a large semi-transparent pipe. The S-Lamp was invented three years ago by Fusion Lighting, a small high-technology firm in Rockville, Maryland. Scientists at DOE's Lawrence Berkeley Laboratory helped develop the light for commercial use. Fusion discovered that sulfur, stimulated by microwave energy, could be used in place of mercury in ultraviolet industrial lamps to produce very bright light of a quality similar to sunlight. The Department has installed an S-Lamp at its Forrestal Headquarters Building in Washington, DC—where it is saving an estimated 60 percent of the energy consumed by previous lighting installations. Industrial lighting costs consumers an estimated \$8 billion each year. Unlike other high-efficiency lamps, the Sulfur Light uses no mercury and produces 50 percent less ultraviolet light.

Increasing U.S. Energy Technology Exports and Investments

The Department continues to conduct trade missions to India, Pakistan, Russia, and China in cooperation with the Departments of State and Commerce. This outreach on behalf of U.S. firms has stimulated international sales of numerous U.S. advanced energy technologies in these countries. To date, agreements have been reached on over \$1.2 billion worth of U.S.-based energy projects in India, \$4 billion in Pakistan, and over \$5 million in Russia. By assisting U.S. manufacturers to export clean technologies, the Department advances the Nation's economic productivity. At the same time, these clean energy exports are critical to the global environment. Developing countries are rapidly expanding their energy consumption, with projected dramatic increases in greenhouse gas emissions and

Trade Mission to India

In the first official visit by a U.S. cabinet official to India in many years, Secretary O'Leary led the Presidential Mission on Sustainable Energy and Trade from July 7 to July 15, 1994. The mission included one of the largest groups of business leaders in an official US government delegation, beginning a new era for partnership between the US and India. Commercial deals valued at \$400 million were closed in 11 business agreements. Several international agreements on energy and environmental cooperation were reached. India Power Minister Salve led one of two follow-up Indian delegations, adding five agreements valued at more than \$800 million.

other energy-related pollution.

The Department has been working cooperatively with other agencies through the Committee on Energy Efficiency Commerce and Trade and the Committee on Renewable Energy Commerce and Trade to assist U.S. manufacturers to export energy efficient and renewable energy technologies. Renewable energy industries such as photovoltaics benefit from exporting to international markets, where the high demand for electrification in developing nations, will allow them to produce in quantities that will further reduce their manufacturing costs.

Leading Voluntary Action to Address Climate Change

Meeting the President's commitment to stabilize U.S. greenhouse gas emissions by 2000 requires that DOE make considerable progress in implementing key Energy Policy Act (EPACT) provisions. The EPACT programs in this area, a significant part of the Climate Change Action Plan often labeled "Energy Partnerships for a Strong Economy," highlight the economic as well as environmental benefits of voluntary, cost-effective, high-leverage programs. These programs have been carefully planned and efficiently executed so as to ensure cost-effectiveness, strong participation by industry partners, and economic benefits to all stakeholders.

As an example, more than 800 utilities have signed up for the Climate Challenge program. A similar program for industrial firms, Climate Wise, has already obtained voluntary commitments from AT&T, DuPont, and other firms, both large and small. Thousands of other prospective partners have helped us plan and implement other programs in this area.

The Climate Wise Program

Six premier companies—DuPont, AT&T, Martin Marietta, Quad Graphics, Johnson & Johnson, and Fetzer Vineyard—have exceeded their targets for reducing production of greenhouse gases in the first months of the voluntary Climate Wise program sponsored by the DOE. Climate Wise encourages industrial companies to identify and commit to emission reduction actions. Under the program, DuPont pledged to reduce its emissions from manufacturing by 18 million metric tons. AT&T is requiring all its facilities to develop and implement five-year energy management plans. Quad Graphics committed to reducing energy use by 3 percent each year until 2000. Martin Marietta launched a number of resource efficiency activities. Johnson & Johnson pledged to reduce energy use by 10 percent by 1996. Fetzer Vineyards is recruiting other growers to join the program.

Partnerships in Clean Car Design

DOE is the leading provider of expertise and resources to the President's Clean Car Initiative. This partnership with the Big Three automakers promises to produce a "clean car" prototype vehicle in 2005 that revolutionizes personal transportation by tripling the fuel economy of new cars, drastically reducing the Nation's dependence on imported oil. Attainment of this program's milestones, developed in agreement with industry, depends on the Department's continued commitment to funding this element of our contribution to the Nation's economic productivity. Private industry cost-sharing in the first two years of the Clean Car Initiative amounts to \$200 million, leveraging cumulative Federal funding of \$570 million. Estimated benefits by 2020 include a savings in oil imports of 25 billion gallons and a reduction in greenhouse gases consistent with eliminating 490 million tons of carbon dioxide emissions.

Modeling Efficient and Safe Cars

In cooperation with the Big Three automobile manufacturers, DOE's Lawrence Livermore National Laboratory (LLNL) is developing computer models of engine combustion efficiency and aerodynamic design. The modeling effort will also enable more efficient crash simulations. In related research, LLNL recently developed a radar technology, licensed to Amerigon, that serves as a warning device to avoid accidents and activate air bags.

Alternative Fuel Vehicles: Jump-Starting a Commercial Infrastructure

The Department continues to provide funding for the government purchase of a variety of alternative-fuel vehicles. This will increase the fuel efficiency of the Federal fleet, provide data, and foster the commercialization of new alternative fuel transportation systems. The success of this Federal leadership program will reduce urban air pollution. The Department's programs in this area, many of which are required by the Energy Policy Act, do not foster mandates or "command-and-control" regulations—they rely on incentives, voluntary participation and Federal market catalysis.

Advanced Natural Gas Automobile

On November 4, 1994, DOE unveiled the first subcompact to be fueled with natural gas. The Advanced Natural Gas Vehicle, designed at the Johns Hopkins University Applied Physics Laboratory, features a driving range of 300 miles or more between fill ups and performance as good as its gasoline counterpart, the Geo Prism. Prior use of natural gas in vehicles has been limited to fleets of trucks, delivery vans, and buses. If the Advanced Natural Gas Vehicle were to be mass produced today, its cost would exceed standard Geo Prisms by roughly \$2,000 to \$3,000. Contributing to the project are the Gas Research Institute, Baltimore Gas and Electric, Southern California Gas Company and Washington Gas.

To date, DOE funding has enabled the government to purchase 15,000 such vehicles, meeting Energy Policy Act goals. In FY 1996, the Department expects to provide for an additional 12,500 vehicles to be added to government fleets. Moreover, 34 cities across the Nation have signed on to the Clean

Cities program. We anticipate that non-Federal government, business, and industry commitments to alternative fuel vehicles will result in the use of 600,000 such vehicles Nationwide by 2000, annually displacing 300 million gallons of gasoline with alternative fuels.

Natural Gas: Promoting a Cleaner Domestic Energy Source

Carbon emissions from burning natural gas amount to roughly half those produced by coal combustion and two-thirds those from burning oil. The Department's Natural Gas and Oil Initiative emphasizes the use of domestic natural gas, with funding going toward research in and commercialization of highly efficient natural gas use and supply. The Initiative is expected to contribute toward increasing the domestic availability and use of natural gas by 4 trillion cubic feet by 2010 through the use of advanced exploration and production technologies. We expect to demonstrate highly efficient and cost-effective gas turbine powerplants, fuel cell powerplants, and efficient natural gas end-use technologies that will stimulate an increase in the natural gas share of domestic energy by more than 25 percent by 2010.

The Department aims to develop advanced gas power technologies by 2000 that have efficiencies up to 80 percent higher than today's electric utility average. These technologies promise significant economic and environmental benefits. Recent successful demonstrations of DOE-developed fuel cell and gas turbine technologies point to a high export potential and reductions in power plant carbon emissions. In this Fiscal Year, the most promising gas turbine systems were selected for further demonstration and two major fuel cell demonstration plants will begin operation. In FY 1996, funding is requested to begin operation of a fuel cell demonstration using landfill gas.

Improving the Prospects for Renewables

In the area of photovoltaics, solar thermal, wind, biomass, and geothermal energy, the Department continues to make progress towards the creation of vibrant, fully competitive worldwide industries. All of these technologies are now cost-effective in niche markets in the U.S. and abroad. Continued cost reductions fostered by our strategic research, development, and deployment activities can ensure America a place in an emerging multibillion-dollar clean energy market. Without our involvement at this crucial juncture, we risk losing our lead in these industries to foreign competitors.

DOE investment in renewable technologies other than hydroelectric power will promote the addition of 15,000 to 20,000 megawatts of renewable electric capacity by 2000. Our cooperative demonstrations of renewable technologies will lead to sharp increases in renewable energy production over the next decade. With as many as 75,000 megawatts of installed renewable power, U.S. industry will be positioned to capture tens of billions in renewables export markets.

Continuing Our Commitment to Clean Coal

Increasing the efficiency of power plants to lower carbon dioxide and other pollutants without increasing generation costs is a high Administration priority. Our continued investment in coal technologies research and development is reaping generous returns with sales of coal cleaning equipment, low-nitrogen oxide burners and flue gas scrubbers. Affordable, clean, and efficient coal-fired systems in the research and development pipeline promise to contribute to future U.S. economic productivity. Developing nations with large coal reserves, such as China and India, are attracted to U.S. clean coal technologies as a means of satisfying rapidly growing energy demand while utilizing coal in a more environmentally-benign manner than their existing facilities without unacceptable levels of pollution. The overseas market for clean coal technologies is expected to average over \$40 billion a year through 2010.

By the end of FY 1995, 16 of our clean coal technology projects will be completed, with four more completions expected in FY 1996. Over the years, DOE's funding of \$2.7 billion for 45 clean coal projects has been leveraged with \$4.2 billion from the private sector. Private sector commitment to the Clean Coal Technology Program matches the Department's commitment to provide clean, affordable energy resources for the Nation.

Weatherization: Needed Assistance in Building Energy Efficiency

Assisting the public to increase the energy efficiency of buildings where it is most needed has long been a Departmental priority. The Department provides funding to States to help pay for home weatherization improvements for low-income citizens. Our FY 1996 request increases weatherization funding on the basis of the high level of success of this program.

To date, DOE weatherization programs in cooperation with Federal and State partners have increased the energy efficiency of over 4.4 million homes. Every year these weatherized buildings use 2.0 trillion fewer Btu's, saving their low-income residents millions of dollars. Our FY 1996 budget will provide for the weatherization of an additional 116,500 homes, and the comparable audit and retrofit of 1,300 public schools and hospitals.

Resolving Energy Resource Concerns

Improving Light Water Nuclear Energy Plants

While our overall nuclear energy research and development budget has been reduced by 40 percent in recent years, the Department is continuing to work toward making standardized, certified, advanced light water reactor designs available before the end of this decade. These designs will ensure that nuclear energy remains an option for the Nation's energy supply early in the next century. The Department's light water reactor

program is conducted in cooperation with the electric utility and nuclear industries, with the private sector to provide more than half of total program funding in FY 1996. The Department is also pursuing technical, cooperative programs to enhance the safety of existing nuclear energy plants and minimize their premature shutdown.

The Department has discontinued advanced research and development in breeder reactors and actinide cycle technologies. Limited private sector interest in these technologies has led us to redirect the valuable nuclear science resources at Argonne National Laboratory toward international nuclear safety and the decontamination and decommissioning of nuclear facilities.

Natural Gas and Petroleum Extraction: Innovations to Bolster Production

Advanced research in technologies to recover and process natural gas and petroleum can boost domestic production of transportation fuels, alleviating demand for imports. As part of the Domestic Natural Gas and Oil Initiative, the Department's work in FY 1996 will focus on transferring DOE advances in computational technology to the petroleum industry, demonstrating advanced oil recovery technologies, and partnering with industry to design the refinery of the future. Cost sharing by industry in computational technology and advanced oil recovery projects averages 50 percent of total costs. The Initiative is expected to result in an increase in average domestic gas and oil production equivalent to 450,00 barrels of oil per day between 2001 and 2010. The Department anticipates that these developments will sustain an average of 30,000 jobs.

Managing the Strategic Petroleum Reserve

The Strategic Petroleum Reserve provides the Nation with insurance against disruptions of international oil supplies. The Strategic Petroleum Reserve continues to be available to draw down and distribute oil within 15 days of notice—providing a deterrent to the use of oil as a political weapon. The 1996 budget focusses on the removal of gas from Strategic Petroleum Reserve oil to allow for a maximum drawdown rate. The Strategic Petroleum Reserve will be consolidated into four sites to eliminate the risks of structural failure at the Weeks Island site. The Department will replace the Strategic Petroleum Reserve's aging surface facilities to assure long-term reliability and lower maintenance costs. Weeks Island decommissioning will be funded through the sale of a portion of the oil stored at the Weeks Island site.

Managing the Naval Petroleum and Oil Shale Reserves

The Department is committed to maximizing the value of the Naval Petroleum and Oil Shale Reserves as a National asset. In response to stakeholder concerns and expert advice regarding the most effective management for the Reserves, the Department will continue to work toward restructuring the Reserves as a corporation and sell or lease the Reserve.

Getting Results with Civilian Radioactive Waste Management

Part of the Department's mission is to manage and dispose of the Nation's civilian spent nuclear fuel, as well as high-level radioactive waste from atomic energy defense activities. Our work to accomplish this mission continues despite previous resource constraints.

Yucca Mountain in Nevada was designated by Congress as a candidate site for a geologic repository for civilian spent nuclear fuel. To date, the Department has invested approximately \$1.8 billion in a scientific investigation of the site. If the site is determined to be acceptable, we estimate that repository operations could begin in 2010.

Our Civilian Radioactive Waste Program has been restructured to focus on determining the technical suitability of Yucca Mountain by the end of 1998 and on ensuring that multi-purpose canisters are available in 1998 for possible at-reactor storage of spent nuclear fuel. Sufficient funding from the Nuclear Waste Fund, in conjunction with appropriated Federal funds, is needed if we are to achieve our mission—leading to the resolution of the Nation's long-standing concerns about permanent disposal of nuclear waste.

Guaranteeing the Availability of Isotopes for Health Care, Industry and Research

The Department is committed to ensuring a reliable supply of stable and radioactive isotopes for applications in health care, industry, and research. In response to customer and stakeholder concerns for a reliable supply of the most widely used isotope for medical diagnosis and therapy, the Department supports the development of molybdenum-99 production.

Redirecting Uranium Technologies

The Department supports multi-faceted activities that rely on knowledge developed through 40 years' experience with uranium enrichment technology. An agreement with the Russian Federation for deliveries of 500 metric tons of Russian highly enriched uranium to the U.S. builds confidence that U.S. arms control and non-proliferation objectives will be met over the next 20 years. The Department has initiated efforts in partnership with the private sector to promote the transition of uranium technologies into domestic markets. Future applications in the field of medicine and environmental cleanup are expected to stimulate economic growth beyond FY 1996. The Department will continue to support the United States Enrichment Corporation in obtaining NRC certification and developing a strategy for managing its depleted uranium inventory.

Maintaining Facility Infrastructure to Support Outer Space Exploration

Radioisotope Thermoelectric Generators (RTGs) are the only viable technology capable of powering exploration missions to the outer solar system. For future projects funded by the National Aeronautics and Space Administration (NASA), the Department will

continue to design and fabricate RTGs and maintain the infrastructure required to support future missions to explore deep space. In 1997, three RTGs fabricated by DOE will be flown on the Casini spacecraft to orbit the planet Saturn.

Fueling Economic Productivity

Applying Core Competencies to Industry Needs

From the perspective of large and small businesses throughout the Nation, it is clear that the Department of Energy has vast technological and research resources that can enhance industry's productivity. DOE conducts a major portion of all Federal research and development at an extensive laboratory system with top scientists and engineers, good project managers, and experience in making highly sophisticated products. The core competencies of the Department's laboratories closely match the competencies industry demands: advanced materials, advanced manufacturing technologies, energy and environmental sciences, computing, electronics and instrumentation, and biotechnology.

Developed over decades to support National security, fundamental science, and energy and environmental missions, the capabilities of DOE's National laboratories are not easily replicated in the private sector. The Department seeks to maximize the return on taxpayer investment in those capabilities by providing economic benefits to the Nation that go beyond the original mission of the laboratories. Fundamental research, toward which the private sector is devoting a decreasing share of its R&D investments, is critical to maintaining U.S. productivity in key industrial areas.

Award Winning Technologies

Over the years, DOE-developed technologies have received a large share of Federal Laboratory Consortium and *Research and Development's* R&D 100 awards, as well as recognition from Industrial Research Institute and others. The number of R&D 100 awards stemming from the DOE research exceeds that of any US company and is three times that of all other Federal agencies combined. A recent study shows that 52 of the 113 DOE technologies that won R&D 100 awards between 1989 and 1992 are having an economic payback. The private sector has plans to commercialize other technologies from this group in the future.

The recent proliferation of our R&D partnerships with industry is indicative of recent successes in applying National laboratory expertise to developing industrial technologies. The Department signed its 1,000th Cooperative Research and Development Agreement (CRADA) in August 1994, more than a year earlier than expected. Industry's mostly in-kind contributions to the current \$2 billion worth of CRADA research underway is valued at 58 percent of the total. Our cooperative planning with industry consortia—in textiles (AMTEX) and auto manufacturing (Partnership for a New Generation Vehicle and the Advanced Battery Consortium)—is aimed at technological advances that will contribute to long-term economic growth and create high-wage jobs for the American

people. Along with the Department of Defense, DOE contributes to SEMATECH research in cooperation with 14 semiconductor manufacturers, in a partnership that is widely credited with the turnaround of the U.S. semiconductor industry.

In addition to CRADAs, the Department is increasingly relying on patent licensing, personnel exchanges, contracts, and reimbursable work for other organizations to contribute to economic productivity. DOE is streamlining its reimbursable work process for non-Federal partners. When all technology transfer mechanisms are included, the Department's collaborations amount to 4,250 partnerships with businesses of all sizes.

In order to make the best use of Federal resources, the Department is planning cooperatively with the Departments of Defense, Commerce, Interior, EPA, and other agencies. We have more than a dozen cooperative projects with DoD in electronics alone. To provide independent reviews of our partnership activities, we are committed to appointing senior private sector executives to the Secretary of Energy's Advisory Board. The Department is also working with our customers to measure the success of our partnership programs, both in terms of outcomes and of DOE performance as a partner.

In FY 1996, we will work with our partners to improve the productivity of the U.S. automobile, textile, semiconductor, computer, and machine tools industries, among others. The Department expects to increase the amount of our laboratory R&D funding that is leveraged by industry cost sharing.

Opening More Doors to the Private Sector

The Department is committed to making it easier for industries of all sizes to access our technological resources and facilities. Over the past year, funding of over \$8 million has been added to our technical assistance to small businesses, provided largely through our laboratories and facilities. DOE is developing a Memorandum of Understanding with the Department of Commerce that will make our laboratories and facilities an integral part of the Manufacturing Extension Program run by the National Institute of Standards and Technology. As a share of the total number of DOE partners, participation by small business in CRADAs has grown from 25 percent a year ago to over 37 percent today. We are reaching out to industries in all States of the Nation, working to increase the share of our

Air Bag Retrofits for Older Cars

An entrepreneur in New Mexico has worked with DOE researchers at Los Alamos and Sandia to develop an air bag kit for retrofitting older cars. After his daughter escaped serious injury in a car accident two years ago, Phillip Kithil turned to DOE's technology transfer program with an idea for improving the safety of cars that lack air bags. With the help of gas flow modeling by a Cray supercomputer at Los Alamos and Sandia Laboratory's expertise in ensuring that nuclear weapons go off only when triggered, Kithil has demonstrated an air bag kit with crash sensors that are highly reliable. The device could be retrofitted into almost any vehicle for a cost of less than \$800. Kithil's estimates that his development costs of about \$200,000 could have amounted to as much as \$2 million if he had not had access to Sandia Laboratory's equipment and expertise.

laboratory R&D budget that is leveraged by private sector funds.

In response to concerns that DOE procedures have been too cumbersome for viable partnerships with industry, the Department has decreased by 50 percent the time needed to establish a CRADA between DOE and a private sector partner. We are working to further decrease this time from approximately 16 weeks. To facilitate the creation of CRADAs in fast moving markets, we are seeking legislative authority to delegate to the laboratory directors the authority to enter into certain classes of CRADAs. In addition, we are streamlining the process to allow the private sector to use DOE research facilities on a reimbursable basis.

The Department intends to reliably support our commitments to our industrial partners. We are developing a selection process for new CRADAs that will balance our portfolio in alignment with projected resource availability for the future years. Our portfolio will balance two related objectives: 1) to seek major and broadly represented partnerships that provide maximum economic and societal benefits, and 2) to develop long-term partnerships with industry and universities that meet mutual technology requirements through jointly structured research plans, ensuring U.S. leadership in science and engineering.

Helping Industry Win through Resource Efficiency

Preventing pollution in the first place is preferable to dealing with industrial wastes after the fact. Minimizing energy and other resource inputs, as well as waste and pollutant outputs, makes good economic sense for industries seeking to become more competitive. U.S. industries are spending billions of dollars annually cleaning up hazardous wastes from manufacturing processes. We are helping industry turn instead to technologies that use resources more efficiently—clean processes that will relieve the economic and environmental burdens of pollution. More productive use of energy and other resources translates to more productive manufacturing. By promoting resource efficiency, we are promoting economic productivity.

Waste Acid Recovery System

A system for recovering acids from industrial waste streams, originally developed at DOE's Pacific Northwest Laboratory for use in nuclear fuel fabrication at the Department's Hanford site, has resulted in the formation of a new firm, Viatic Recovery Systems. An economical and environmentally sound way to minimize waste, the Waste Acid Detoxification and Reclamation system recovers and recycles acids in industrial processes, thus reducing the cost to industry of raw materials. The system provides businesses of all sizes with an economical way to address environmental regulations, and avoiding disposal costs—with a payback of about 2 years.

The Department's pollution prevention and waste minimization programs cut across organizational boundaries. We are developing our partnerships with energy-intensive industries—chemical manufacturing, petroleum refining, pulp and paper, and metals—to develop strategies and technologies that will lead to dramatically improved energy and

resource efficiency and economic productivity by 2000. In FY 1995, we will establish goals and performance measures for partnerships in four of these industries. The measures will show the amount of energy and materials saved, pollution prevented, and productivity increases relative to FY 1994 performance. Our pollution prevention strategies for FY 1996 will be based on these results.

Changing the Way We Do Business

Rightsizing the Department's Workforce

Streamlining our workforce and the way we work is bringing productivity improvements to DOE. The Department is acting to increase the ratio of employees to supervisors, move headquarters positions to the field, and reduce staffing. In accordance with these changes, we are reinventing the way we do business—by eliminating unproductive processes, asking our employees to take on both more responsibility and more accountability, and listening closely to our stakeholders as we make decisions.

In FY 1994, the Department initiated efforts to reduce administrative costs by eliminating supervisory positions. As a result, the Department's employee-to-supervisor ratio increased from 4.7 to 1 as compared to 5.7 to 1. We expect to achieve a 10 to 1 ratio in FY 1995. Offering employees incentives to retire has allowed the Department to align staffing with mission priorities and implement National Performance Review goals. Reliance on these incentives will continue.

Since 1993, we have reduced the number of our directives and orders by 18 percent, thus saving \$38 million in resources. In FY 1995, we are cutting these internal controls and regulations by another 50 percent in order to increase our productivity. In FY 1996, the Department will continue to eliminate layers of supervision, shift resources to higher priorities, and reduce burdensome directives with the goal of serving our customers in a cost-efficient and effective manner.

Reducing Costs through Contract Reform

Our Contract Reform Initiative is fundamentally changing the way the Department does business. DOE is replacing outmoded and burdensome contract processes with a greater use of fixed price and cost-sharing contracts. We are basing compensation on well-defined performance criteria and measures. Our contracts now offer incentives for contractors to improve their performance and reduce the cost of their services. We promote individual and institutional diversity among our contractors. Our contractors are held accountable for the safety and health of workers and the public, and the protection and restoration of the environment.

Some of our former contracting practices were the product of Cold War necessities: attracting industry to high risk secretive work meant covering most financial risks,

limiting external oversight, and employing a single contractor at each site. With the exception of certain well-defined cases, DOE has ended the practice of covering third-party claims, fines, and penalties for our contractors. It is now our policy to open our contracts to competition at least every 10 years, rather than simply extending the contracts of incumbents. Our contractor selection is based on "best in class" criteria. We have enhanced our financial management systems and now hold our contractors more accountable for costs and risks.

To accelerate the process of contract reform, the Secretary issued an action memorandum on July 5, 1994

suspending DOE's contract decision process and announcing decisions for 19 major M&O contracts. The memorandum announced the decision to compete 6 major contracts valued at over \$18.6 billion. It extended 10 contracts valued at over \$13.5 billion on the condition that they incorporate a full range of contract reforms within 6 months. FY 1994 decisions on competing the \$3.3 billion Rocky Flats contract and awarding the \$4.8 billion Idaho National Engineering Laboratory contract reflect the Department's reforms. Issued on October 5 for public comment, the Department's new contracting policy establishes competition as the norm.

In FY 1996, we will continue to identify "best-in-class" contracting practices, remove barriers to contract reform administration, and monitor the progress of reforms. The Department expects its contract reforms to save over \$5 billion during the next five years.

Improving Performance through Regulatory Reform

Approved in FY 1994, the Department's improved rulemaking process emphasizes teamwork, innovation, and management accountability. Through an effective management information system and realignment to provide more cost-effective support to program offices, the Department expects to reduce the average time for rulemaking development by about 50 percent. We are focussing on improving the quality of the Department's rulemaking by enhancing public participation in the process and consulting with State, local, and tribal governments. In FY 1996, we expect to further accelerate the pace and improve the efficiency of the process, saving an estimated \$700,000 each year. The increased public participation and the transparency of our rulemaking will build public confidence in DOE regulatory activities.

Financial and Management Controls

The Department has been improving its financial and management controls with the aim of reducing costs. In one of many examples of the resulting changes, the Chemical Exchange Warehouse at Lawrence Livermore National Laboratory has offset more than twice its startup costs by offering surplus, but usable, chemicals to other users rather than disposing of them as hazardous waste. The Y-12 Plant in Oak Ridge, Tennessee, reduced its radiological control area, eliminating four boundary control stations for a cost savings of \$1.2 million a year. The Idaho National Engineering Laboratory consolidated its five contractors under a single contract for a projected savings of over \$500 million over the next five years.

Inviting Stakeholder Review of Priorities

The Department is working to include stakeholder participation in decision-making processes across the organization. Nationwide hearings are allowing our stakeholders to contribute to the National Energy Policy Plan. Consideration of stakeholder input has become a responsibility of managers across the Department. The performance measures DOE has established for evaluating its programs emphasize customer satisfaction. Enhancing stakeholder participation is an essential element in the Department's efforts to improve service to our customers and build public confidence through increased openness.

Tangible success from our partnerships with stakeholders of our Environmental Management program has been outstanding. We renegotiated the Hanford Tri-Party Agreement with Washington State and EPA for a savings of more than one billion dollars. A proposed closure plan with the State of Tennessee was revised through public involvement, saving the Department \$50 million. Through cooperation with our stakeholders, the cleanup of the Chemical Disposal Site in Ames, Iowa was greatly accelerated while paperwork was reduced.

The Envoy Program

The envoy program at DOE's Fernald Field Office in Cincinnati was established in 1994 to promote communication between Fernald personnel and local community groups. In this program, DOE employees and contractors serve as envoys to stakeholder groups such as property owners, business leaders, schools, environmental groups, and public officials. The program improves the decision-making process at Fernald by building relationships with stakeholder groups, allowing Fernald envoys to listen to stakeholder suggestions, concerns, and questions about the ongoing environmental cleanup at the Fernald facility. As a result of the activities of its 75 envoys, Fernald now holds discussions with 42 stakeholder groups with whom DOE had no previous contact.

Protecting Whistleblowers

Protecting and celebrating whistleblowers is a cornerstone of the Secretary's policy to provide for the successful operation of the entire DOE complex. It is essential that whistleblowers be afforded adequate protection in order to encourage employees to disclose sometimes very critical problems in the operations of DOE facilities. At the same time, contractors must be protected from claims lacking merit. In FY 1996, we will continue to protect contractor employee whistleblowers by investigating and adjudicating complaints of reprisal, holding hearings, and issuing fair and impartial decisions in cases brought before us.

Information: Advancing Our Outreach

The Department continues to seek productivity improvements in communications and automated data systems technologies. In addition to bringing information systems advances to our workplaces, we are increasing public access to the Department's vast information resources through the Internet. On October 6, 1994, DOE unveiled its Internet "Home Page", a "one-stop-shop" on the information highway where Americans can get instant information about Department of Energy programs. Accessible to millions of homes and businesses, our Home Page provides general information about DOE, contact

information, and pathways for finding and directly accessing information produced by the Department's staff and program offices, National laboratories, and other facilities. Results of the Department's scientific and technical research will be increasingly available worldwide in FY 1996.

DOE's Energy Information Administration (EIA) develops and distributes energy information to the Nation. EIA data is widely used by the Department, other Federal agencies, Congress, State government, and researchers to document and project energy trends and understand international energy developments. In FY 1996, EIA will continue to meet the increasing demand for critical energy information, by collecting, processing, and disseminating energy-related data.

EIA Provides Early Warnings

DOE's Energy Information Administration (EIA) has been closely monitoring and forecasting energy supply and gasoline prices in relation to the January 1, 1995 startup of mandated use of reformulated gasoline throughout the nation. An EIA study in October helped calm market concerns over possible disruptions in energy supply, by showing that the reformulated gasoline production and logistics targets are achievable. EIA forecasts are keeping the petroleum and other interested parties aware of the tightness in supplies, and EIA is developing an expert system to provide an early warning of possible supply disruptions.

FY 1996 Budget Highlights

The FY 1996 budget presentation which follows is organized by the Department's major business lines. The following chart displays the request for new budget authority.

Department of Energy Budget Request

(Dollars in Billions)

FY 1996 Budget Authority — \$17.8 Billion

The following table compares the budget request for FY 1996 with the appropriated FY 1995 funding levels displayed on a comparable basis.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
The Department of Energy		
Science and Technology	\$2,724.2	\$2,777.9
National Security	4,525.7	4,922.2
Environmental Quality	7,203.6	7,003.5
Energy Resources	2,636.6	2,737.7
Management and Other Activities	405.1	391.3
Total, Department of Energy	\$17,495.2	\$17,832.6

The FY 1996 budget represents the first year of a five year plan in which the Department will reduce its spending by \$15.8 billion in budget authority and by \$14.1 billion in outlays. FY 1996 is a transition year as the Department embarks on its multiyear effort to "do more with less."

The Budget Highlights are presented by business line; however, the fifth business line, Economic Productivity, which is described in the Policy Overview section, cuts across multiple organizational missions, funding levels and activities and is therefore included in the discussion of the other four business lines.

Energy Resources

Increasing demands for energy from industry and consumers shapes the Department's mission of developing new and improved energy sources while conserving existing resources. The Department's support for Energy Resources is reflected in two principal areas. Increasing the efficiency of energy end-use is the focus of DOE's energy efficiency and other programs. We seek to secure future energy supplies by diversifying fuel sources, by developing technologies which make use of indigenous resources in an economic and environmentally benign fashion, and by reducing our vulnerability to energy supply disruptions.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Energy Resources		
Increasing Energy Efficiency	\$770.8	\$890.6
Securing Future Energy Supplies	1,865.8	1,847.1
Total, Energy Resources	\$2,636.6	\$2,737.7

High-payoff research, development, and deployment activities supporting the Administration's Partnership for a New Generation of Vehicles (PNGV) Initiative, the Climate Change Action Plan (CCAP), and the Energy Policy Act of 1992 are included as part of this larger category. Other investment and savings initiatives of the Administration included in this section are natural gas utilization; alternative fueled vehicles; low-income weatherization grants; Federal energy management; phase out for advanced nuclear reactors; additional support for fusion energy; and a cessation in oil acquisitions for the Strategic Petroleum Reserve.

Increasing Energy Efficiency

Some of the greatest opportunities for increased returns on investment come from improvements to energy efficiencies. Energy conservation and efficiency improvements in homes, commercial buildings, transportation, and industry can contribute significantly to offsetting increased energy demand while freeing up capital to be utilized elsewhere. Benefits from demand reduction include foregoing costly capital investments in electric capacity, reducing reliance on imports as well as reduction of acid rain and emission of greenhouse gases, and other pollutants. Holding U.S. greenhouse gas emissions to 1990 levels by the year 2000 with cost-effective domestic actions is the backbone of the President's Climate Change Action Plan and will be achieved primarily through enhanced efficiency. Reducing energy consumption in Federal facilities and in low-income homes are also major objectives of the Administration. The FY 1996 budget request for energy efficiency activities is 16 percent higher than the FY 1995 appropriation.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Increasing Energy Efficiency		
Utility Sector	\$8.7	\$9.8
Buildings Sector	115.6	152.5
Transportation Sector	206.3	258.5
Industrial Sector	135.2	170.3
Technical and Financial Assistance - non-grants	40.4	44.8
Policy and Management	8.3	11.2
Subtotal, Increasing Energy Efficiency	514.5	647.1
Technical and Financial Assistance - grants	279.4	276.5
Subtotal, Increasing Energy Efficiency	793.9	923.6
Less: Recoveries from Petroleum Overcharge	-20.9	-17.0
Use of Prior Year Balances and Other Adjustments	-2.2	-16.0
Total, Increasing Energy Efficiency	<u>\$770.8</u>	<u>\$890.6</u>

Utility Sector

FY 1996 funding for Utility-related energy efficiency includes support for more widespread adoption of integrated resource planning at the State level as required by the Energy Policy Act of 1992 and the Climate Change Action Plan. By developing analytical techniques and evaluation methods, these efforts encourage utilities to consider all supply and demand options when planning to meet capacity requirements and to assist utilities in improving operating efficiency, conducting demand-side management programs, and promoting increased end-use efficiency. These actions result in lower energy bills to customers and decrease environmental damages.

Building Technologies Sector

Residential and commercial buildings consume over a third of all U.S. primary energy - more than any other sector - and over 65 percent of the electricity we generate. The potential exists to improve energy efficiency in the buildings sector by 30 percent. This would reduce consumer energy expenditures by \$75 billion in 2010, reduce carbon monoxide emissions by 72 metric tons per year, provide 345,000 new jobs, and free investment capital that would otherwise be required to build 80 1,000-megawatt power plants during the next 20 years. To realize this opportunity, the Building Sector budget supports five primary areas of effort: research and development, codes and standards, Federal energy management, implementation and deployment, and management and planning. In research and development, three major areas are addressed: building

systems, envelope, and equipment. In codes and standards, building codes and appliance standards are addressed.

Research and development activities focus on improving the performance and cost-effectiveness of the building as an integrated system consisting of architectural, functional, and key energy-related components.

Codes and standards activities develop, promulgate, and update test procedures and energy efficiency standards for certain residential appliances and commercial equipment; develop, update and promulgate energy efficiency standards for the construction of new Federal buildings; and develop and promulgate regulations for the labeling of commercial equipment for energy efficiency. The Department's programs also support consensus organizations in upgrading voluntary building energy codes and promote a National effort to make Home Energy Rating Systems and Energy-Efficient Mortgages readily available and energy-efficient homes more accessible to the home buyer.

The Federal Energy Management Program (FEMP) works to reduce the cost of government by advancing energy efficiency, water conservation, and the use of solar and other renewable energy as means to reduce energy costs. It accomplishes this by working closely with other agencies to encourage their investment in energy efficiency by providing training and support, promoting the use of performance contracting, and providing highly leveraged seed funding. FEMP implements statutes and Executive Orders which direct that energy in Federal buildings and operations be used efficiently. Executive Order 12902 holds agencies accountable for achieving the goals and assigns FEMP the responsibility of coordinating implementation. The Federal government is the single largest energy consumer in the United States, spending almost \$9 billion on energy bills annually. In 1992 the Federal government saw its second straight year of energy use reductions in buildings, saving over \$200 million annually. The Department of Energy, in particular, has already exceeded its goal of a 20 percent reduction in energy use over a 1985 baseline. It is estimated that the Federal Government will achieve a 30 percent reduction in building energy use in all agencies by 2005 saving \$1 billion annually. Economic security will also be improved by reducing oil imports by 5 million barrels annually. In addition, FEMP expects to achieve a 10 percent reduction in Federal mobility energy use by 2005 with savings of \$400 million annually. In order to ensure achievement of the stated goals and realization of the benefits of the FEMP program, the following performance indicators for FY 1996 have been developed:

- Award 100-150 grants for energy efficiency, renewable energy and water conservation projects through the Federal Energy Efficiency Fund,
- Provide assistance through the Regional Energy Action Program to selected Federal leadership regions that will lead to completion of 20 projects,
- Expand State pilot programs to a total of seven States where partnerships exist for energy audits and financing programs,
- Train 2,500 Federal energy managers in approximately 75 FEMP training programs
- Train "qualified instructors" to multiply delivery capability,

- Complete SAVEnergy Action Plans in 500 Federal sites that will lead to project implementation,
- Impact 100 energy savings performance contracts by providing training, technical assistance and on-site support.

Transportation Sector

Reducing energy imports by the United States or changing the sources of dependency will require major changes in the transportation sector's energy demand patterns. Achieving improvements in air quality is also linked to breakthroughs in transportation propulsion technology, as well as changes in the mix of fuels used for transporting both people and freight. For example, in 1993 the transportation sector accounted for 45 percent of the oxides of nitrogen emissions, 77 percent of the carbon monoxide emissions, 36 percent of the volatile organic compounds emissions, and 32 percent of the carbon dioxide emissions. The FY 1996 budget request for the transportation sector reflects the importance of continuing to build a solid foundation for a "revolution" in transportation.

Consumers must be able to buy advanced vehicles for a reasonable price and have confidence in their performance. U.S. producers require new technologies now, for introduction into the marketplace before the year 2000. This requirement is reflected in the budget by support for demonstration, testing, and deployment of alternative fuel vehicles. The budget request also aims to accelerate the availability of technologies with longer term commercial potential. The FY 1996 budget request is 27 percent higher than the FY 1995 enacted level, reflecting the Department's strong support for these programs.

Pursuing multiple technology paths increases the probability of success, and it establishes the basis for continuing advances over the decades ahead. Activities focus on advanced propulsion systems, improved materials, and cost and performance improvements.

The Partnership for a New Generation of Vehicles (PNGV) promises to provide increased focus and coordination for overall government and industry vehicle development activities. The three goals of the PNGV are: (1) developing advanced manufacturing techniques; (2) near-term improvements in vehicle efficiency, safety, and emissions; and (3) enabling the development of passenger vehicles with triple the fuel economy of current vehicles. The transportation program has long supported technology development related to PNGV goals, and it has built an excellent foundation for the PNGV program. Improving fuel economy by a factor of three will require successful development of new technology for energy conversion, energy storage, hybrid propulsion, and lightweight materials. These development efforts are already being supported in the Department's FY 1996 budget. In fact, approximately 67 percent of the total Federal budget of \$370.6 million for PNGV in FY 1996 has been requested for DOE programs.

In response to the Energy Policy Act's provisions, there is an increased emphasis on accelerating the commercial deployment of vehicles which use alternative fuels. While the increase in the FY 1996 budget request specifically for deployment activities is relatively small, the transportation program is emphasizing the improved leveraging of its funds by forming, promoting, and supporting new partnerships. A primary and visible example of these is the Clean Cities program. The premise of Clean Cities is local initiative; Federal agencies then respond to the commitments made by numerous government and private organizations. Success in Clean Cities, a voluntary program, should pave the way for fleet owners to successfully comply with fleet alternative fuel mandates, which will be required beginning in 1996. By the end of 1994, the Clean Cities program had created partnerships in 34 cities throughout the country. These "pioneer" Clean City programs feature approximately 30,000 operational alternatively-fueled vehicles—reducing oil consumption and tailpipe emissions.

Industrial Sector

Industry Sector programs are based on the recognition that enhanced energy efficiency is a key to increasing industrial productivity and that improving efficiency of industrial energy use is closely linked to reducing waste and pollution. The goal of the industrial energy program is the creation of a more efficient, competitive, environmentally sound, and sustainable domestic industry, and to promote environmental stewardship, competitiveness, and job preservation and creation by demonstrating profitable alternative approaches to regulatory compliance.

U.S. industry accounted for 25 percent of U.S. gross National product in 1991 and provided jobs for 26 million workers in 1993. Industries generate annually about 2 million tons of tightly-regulated toxic wastes, 12 million tons of air pollutants (in addition to CO₂), 600 million tons of hazardous wastes and approximately 12.5 billion tons of other wastes. These wastes not only represent inefficiencies of production but they also create environmental problems and cost industrial firms billions of dollars per year. Currently, industry pays twice: first to purchase the feedstocks and fuels that create product and pollution and secondly to treat and dispose of wastes and pollutants. This is why efficiency is so vital to the economy.

Six major materials and process industries (Chemicals, Pulp and Paper, Petroleum Refining, Food Processing, Metals, and Ceramics and Glass) collectively employ about 4.2 million workers, and they account for about 20 percent of all U.S. merchandise trade, over 8 percent of U.S. gross domestic product, 40 percent of manufacturing investment, 88 percent of total energy used in industry and over 95 percent of all industrial waste and air emissions. These are the principal focus of the Industrial Sector programs. Each of the basic materials and process industries is joining with the DOE, States and other Federal agencies to develop a forward-looking concept of "Industry of the Future" which considers economic, environmental, and competitive drivers that are forcing change. These efforts are characterized by research and demonstration to improve efficiency of industrial processes and means of production.

Instead of process research, smaller industrial firms industries need information and access to existing technologies. These programs are designed to lower risk, demonstrate new technologies, and accelerate deployment of more efficient technologies.

Commercialized DOE-sponsored technologies are closely monitored through annual surveys. These surveys indicate that technologies developed with Federal funding contributed to industrial sector energy savings of 95 trillion BTU in 1993 equivalent to about 17 million barrels of oil and industrial cost savings of over \$300 million. Cumulative savings of the program amount to more than 500 trillion BTU (0.5 Quads), valued at an estimated \$1.6 billion. In FY 1993, DOE-sponsored technologies helped increase industrial employment by more than 16,000 man-years and helped reduce over 7 million tons of carbon dioxide (CO₂), 15,000 tons of nitrogen oxides, 31,000 tons of sulfur dioxide, and 5,000 tons of volatile organic compounds annually. Increased capital productivity of DOE-sponsored technologies exceeded \$1.2 billion in 1993.

Program performance data suggest that by 2020, Industrial Technology programs can reduce annual industrial primary energy consumption by 7.7 quads, including about 1.1 quads of oil. Simultaneously, these programs will help reduce CO₂ emissions by 19 million tons a year, save industry about \$25 billion in direct energy costs and \$18 billion in non-energy costs each year. The annual use of renewable energy in industry is expected to increase by 1.4 quads by 2020, to a total of 3.7 quads.

The FY 1996 budget request supports continuing and new industrial activities such as the Partnership for New Generation Vehicle, which includes Vehicle Recycling, Aluminum Spray Forming, Low-Cost Neodymium, and Foundries. The Environmental Technology Partnerships is a new initiative in FY 1996. It highlights cooperation between DOE offices and energy- and pollution-intensive industry sectors developing a science and technology base for industrial growth using systems-integrated approaches that lead to cost-effective solutions of low or no environmental impact. The FY 1996 request also includes Motor Challenge and Market Transformation Strategies; National Industrial Competitiveness through Energy, Environment, and Economics (NICE³; Energy Analysis and Diagnostic Centers (EADC); and Climate-Wise. The Advanced Turbine Systems (ATS) program includes materials work which supports both the Fossil Energy and Energy Conservation portions of the ATS program. The Metals Initiative request includes advanced process control for steel mills, pressure calcining of alumina, and spray forming of aluminum (which also supports the PNGV mentioned above).

Technical and Financial Assistance

Transferring new energy-efficient technologies into practical use and extending the benefits of energy-saving methods and strategies Nationwide is fundamental to significantly reducing energy demand. The Office of Technical and Financial Assistance operates a number of grant, technical assistance, and information programs in order to accelerate the rate at which viable, new energy efficiency technologies and practices are drawn into the domestic and international marketplace.

Non-Grants

The international market development program supports the development of fair and competitive international markets for U.S. energy efficiency technologies. The Office of Technical and Financial Assistance will continue to support the Committee on Energy Efficiency Commerce and Trade (COEECT), which provides export assistance to U.S. energy efficiency industries, and the Asia Pacific Economic Cooperation (APEC), which disseminates information and links U.S. producers with export markets in APEC nations. The international program will increase its support of the Energy Efficiency Centers that have been established in conjunction with U. S. Agency for International Development (AID) and the Environmental Protection Agency (EPA) to support export activities to developing countries, and it will continue to support the Center for the Analysis and Dissemination of Demonstrated Energy Technologies (CADDET), which serves as a conduit for disseminating technical information on U.S. energy efficiency products to foreign decision makers and which provides U.S. industries valuable data on cutting edge technologies being demonstrated by member nations.

Grants

Through the operation of three formula grant programs, OTFA supports and encourages use of energy efficiency technologies at the State and local levels, in the private sector, and in nonprofit institutions. In FY 1996, OTFA will continue to encourage States to leverage private sector involvement in the deployment of energy efficiency and renewable energy technologies. The FY 1996 grants budget request allows approximately 116,145 low-income homes to be weatherized; promotes energy efficiency activities in approximately 1,350 schools and hospitals; and strengthens broad capabilities at the State level to support accelerated acceptance in the marketplace of energy efficiency technologies. The weatherization program will reduce by 2,044 trillion BTU the amount of energy that would have otherwise been consumed and will support 11,900 jobs annually through the network of State and local agencies that conduct the weatherization activities. Improvements made in schools and hospitals will result in energy savings of 0.003 quads and projected energy costs savings of \$15 million, and it will create 1,280 jobs annually.

Securing Future Energy Supplies

Improving the Nation's ability to develop and secure future energy supplies is the second theme in developing the Nation's energy resources. We seek to achieve this goal by research and applied technology development aimed at diversifying energy sources by promoting increased use of indigenous resources, including oil, gas, coal, nuclear, and renewable energy. We also support efforts to increase the efficiency of electric energy distribution and storage.

A critical element of the theme of developing and securing future energy supplies is reducing the Nation's vulnerability to energy supply disruptions. We approach this in

two ways, through a targeted research and development program and by maintaining an emergency response capability. We are pursuing an aggressive multi-agency research and development program aimed at potentially high-payoff technologies for reducing U.S. oil vulnerability. The elements of this program include research and development on biomass and other alternative fuels, advanced vehicle propulsion systems, and enhanced oil recovery. To better ensure early commercial application of successful technologies, this research and development will be based on cost-shared joint government-industry-university models wherever possible. The budgets for programs which are part of our emergency response capability include the Strategic Petroleum Reserve and the Office of Emergency Preparedness. The following table displays the funding associated with these efforts.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Securing Future Energy Supplies		
Energy Supply and Distribution	\$1,534.5	\$1,712.2
Preparing for Energy Emergencies	331.3	134.9
Total, Securing Future Energy Supplies	<u>\$1,865.8</u>	<u>\$1,847.1</u>

Energy Supply and Distribution

Energy supply technologies supported by the Department seek to expand production of domestic supplies of oil and gas; develop liquid fuels for transportation from new sources, such as biomass and coal; pursue ways to burn coal more cleanly; facilitate the use of nuclear power by supporting the standardization and licensing of the current generation of nuclear reactors; expand the use of renewable resources including solar energy; and, support energy storage and distribution technologies and the Power Marketing Administrations, which distribute and sell power from Federal facilities.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Energy Supply and Distribution		
Fossil Energy	\$495.3	\$488.0
Nuclear Energy	291.9	382.8
Uranium Supply and Enrichment Activities		
Uranium Enrichment	89.4	102.9
Revenues	—	-34.9
Total, Uranium Supply and Enrichment Activities	89.4	68.0
Solar and Renewable Energy	424.3	452.2
Power Marketing Administrations	402.4	374.4
Subtotal, Energy Supply and Distribution	1,703.3	1,765.4
Use of Prior Year Balances and Other Adjustments	-168.8	-53.2
Total, Energy Supply and Distribution	<u>\$1,534.5</u>	<u>\$1,712.2</u>

Fossil Energy

The Fossil Energy program is assisting U.S. industry in developing and applying advanced technologies to produce and use our abundant supplies of fossil fuels more efficiently and cleanly. In FY 1996, key efforts will include the implementation of the Domestic Natural Gas and Oil Initiative, and several efforts such as high efficiency, clean power systems development and deployment in support of the President's Climate Change Action Plan. The petroleum research continues field demonstrations and supporting research to address constraints to oil recovery in high priority reservoir classes. Fossil Energy is taking steps to promote the export of domestic fossil fuel technology by working with other Departmental groups, Federal agencies, international organizations and private sector companies.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Fossil Energy		
Clean Coal Technology	\$37.1	\$45.0
Fossil Energy R&D		
Coal Research and Development	154.4	114.9
Petroleum and Gas Technologies	198.0	232.6
Program Direction & Management Support	72.3	69.9
Other Fossil Energy R&D	33.5	25.6
Total, Fossil Energy R&D	458.2	443.0
Subtotal, Fossil Energy	495.3	488.0
Use of Prior Year Balances and Other Adjustments	-20.3	-8.9
Total, Fossil Energy	\$475.0	\$479.1

Clean Coal Technology

With coal currently generating 57 percent of U.S. electric power and projected to remain a dominant fuel for the power industry for well into the future, cleaner and more efficient coal-based technologies are becoming increasingly important for the Nation's energy and economic future. The Clean Coal Technology (CCT) program is a technology demonstration effort jointly funded by government and industry. The CCT program requires at least 50 percent cost-sharing with industry and provides for recoupment of public investments from major commercial successes. There are currently 45 active projects in the program with a combined value of about \$7.0 billion, of which the industry share is 66 percent. By the end of FY 1995, 17 CCT projects will be completed, with six more completions expected in FY 1996.

The FY 1996 appropriation request of \$45.0 million provides incremental funding for projects selected in Round 4 and Round 5.

Fossil Energy Research and Development

A. Coal Research and Development

The Coal Research and Development Program in FY 1996 continues its focus on improving the environmental acceptability of coal. The FY 1996 budget request, \$114.9 million, includes efforts to develop ultra-high efficiency technologies such as integrated gasification combined cycle, pressurized fluidized bed, and indirectly fired coal cycles. These efforts will progressively increase system efficiency, reaching 60 percent in 2015 versus 35 percent for new plants today. Carbon dioxide will be reduced by 47 percent and other pollutants (NO_x, SO_x,

particulates) decreased to 1/10 of New Source Performance Standards. It also supports efforts to improve coal preparation and environmental control technologies and to expand their application for the removal of impurities that can create potential toxic air emissions. Exploratory efforts will continue to examine ways of capturing and using carbon dioxide produced by coal combustion. The program will also continue the development of technologies at laboratory and bench scales that can reduce the costs of producing transportation-grade liquid fuels from coal.

In each of the major areas of coal technology, research will be carried out to explore even more advanced concepts, and a crosscutting program involving research in coal utilization science materials, and other generic areas will continue.

B. Natural Gas and Petroleum Technologies

The Natural Gas and Petroleum programs are proposed for funding increases in FY 1996 in response to the Administration's release of the Domestic Natural Gas and Oil Initiative (DNGOI). The near-term strategies from the Petroleum program focus on identifying and maintaining economic access to geologic classes of U.S. reservoirs that are in danger of being prematurely abandoned despite containing large amounts of potentially recoverable crude oil. This program includes 33 projects involving approximately \$290 million in expenditures, 56 percent of which is from the private sector. In FY 1996, the program will continue to award competitively selected projects for Classes 3 and 4 and continue the feasibility study of Class 5. In addition, the petroleum program includes exploration and advanced extraction research, oil processing research directed at helping the industry transition to the "Refinery of the Future", environmental research and technology transfer. We estimate that the use of advanced technologies to explore, produce, and process crude oil will increase domestic crude oil production by 49 million barrels, reduce balance of payments by \$940 million, add \$125 million to Federal and State revenues, and create 8,800 new jobs by 1998. Advanced technology projects in FY 1994-96 may contribute to increased benefits of approximately 25 percent when the techniques are used throughout the industry.

To accelerate the dissemination of these technologies so that more domestic petroleum may be produced, and fewer producing fields are abandoned, we have included funds of \$4.8 million to further develop the Nationwide, industry-led, multi-faceted natural gas and oil technology transfer effort. Funding for the effort was initiated in FY 1994. To help stimulate the exploration and production of more recoverable domestic natural gas and oil, we contributed \$18.1 million to the Department's \$50 million Advanced Computational Technology Initiative. Both of these measures are included in the Administration's Domestic Natural Gas and Oil Initiative.

In the Natural Gas program, efforts are expanding in exploration and production, environmental research and analysis, delivery and storage, and utilization R&D.

We are proposing to continue efforts to improve gas recovery efficiency from both conventional and non-conventional formations. In the Exploration and Production program, we are working along R&D areas: (1) Drilling, Completion and Stimulation; (2) Low Permeability Formations; (3) Resources and Reserves; and (4) Low Quality Natural Gas Upgrading. Through the use of advanced exploration and production technologies, we estimate that by the year 2010, the domestic natural gas supply will be increased by an additional four trillion cubic feet over the 1991 level of 19 trillion cubic feet.

We are proposing new efforts to improve the Nation's delivery and storage of natural gas by initiating uniform production reporting guidelines for the States. Improving the deliverability and reliability of the U.S. pipeline industry through real-time monitoring of gas flows is essential if we are to encourage the increased use of gas by the power generators and industrial customers. Gas storage operators have supported Department of Energy R&D that will lower their operating costs by developing technologies that enhance the deliverability of gas from existing underground storage facilities.

In FY 1996, as part of our efforts to expand the use of natural gas we will continue our efforts to develop and deploy fuel cell power systems and advanced gas turbine systems. A new, \$8 million effort is proposed to accelerate demonstrations of advanced fuel cells. This effort is part of the President's Climate Change Action Plan. In addition, the industry cost-shared development of molten carbonate and solid oxide fuel cell technologies will continue with a goal of ultimately boosting fuel cell power generating efficiencies to 60 percent or more. Another aspect of the Climate Change Action Plan will be a new \$2 million effort to improve the recovery of natural gas from coal beds. Development also will continue in advanced gas turbine systems, a program that responds to the President's long-term investment strategy. In FY 1996, the Office of Fossil Energy in partnership with industry will continue to focus on advanced turbine systems for utilities while the Office of Energy Efficiency and Renewable Energy will concentrate on advanced industrial turbine systems. In both, the focus will be on innovative cycle design and testing.

Fossil Energy Fuels Program

The goal of the Fuels Programs is to provide American consumers with supplemental supplies of reliable, competitively priced, and environmentally acceptable natural gas and electricity, and to encourage the development of a North American energy market. Programs include issuing authorizations for the import and export of natural gas; the export of electricity; the construction and operation of transmission facilities for exchanges of electricity across international borders; accepting certificates of compliance with the requirement that utilities be constructed with alternate fuel capability, and issuing exemptions from the provisions of the Powerplant and Industrial Fuel Use Act of 1978, Public Law No. 95-620.

Nuclear Energy

The Department's nuclear technology programs are divided into four parts—technologies supporting development of civilian nuclear energy, technologies developed from the redirection of Argonne National Laboratory (ANL) resources formerly used on the Integral Fast Reactor program which support higher priority nuclear technology missions of DOE, technologies providing power for manned and unmanned space activities, and technologies supporting international nuclear safety activities. The apparent year-to-year increase in large part reflects the transfer of funding of international activities from the Agency for International Development to the Department of Energy. Also included in this category is Federal support to the Department's Isotope Production and Distribution program to produce and distribute isotopes required for the Nation's health care and industrial competitiveness.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Nuclear Energy		
Civilian Reactor Development	\$91.3	\$49.7
Nuclear Technology Research and Development	—	37.3
Space Power Technologies	61.1	49.2
Termination Costs	69.7	81.7
International Nuclear Safety Activities	—	83.8
Other Nuclear Energy	50.3	55.7
Isotope Support	19.5	25.4
Subtotal, Nuclear Energy	291.9	382.8
Use of Prior Year Balances and Other Adjustments	-3.4	—
Total, Nuclear Energy	\$288.5	\$382.8

A. *Civilian Reactor Development*

Nuclear energy currently provides approximately 20 percent of the electricity supply of the United States. Maintaining nuclear energy as an option to meet the Nation's growing demand for energy is one objective of the Department of Energy. Nuclear energy can provide a secure and clean domestic source of energy generation without emissions of greenhouse gases or acid rain precursors. The Civilian Reactor Development program is focused on advanced light water reactors which are expected to be safer, more reliable, and less expensive than current generation nuclear energy plants.

1. Light Water Reactor

The major goal of this program is to make commercially standardized Advanced Light Water Reactors (ALWRs) available at the earliest possible time, to allow their contribution to the minimum of 200 gigawatts of new electrical generation capacity projected to be required by the year 2010. The ALWR program budget for FY 1996 is \$49.7 million.

In FY 1996, the program is co-funding with the utility industry completion of design certification rulemaking proceedings for securing the Nuclear Regulatory Commission (NRC) certification for the General Electric Advanced Boiling Water Reactor and the Combustion Engineering System 80+ Advanced Pressurized Water Reactor. The co-funded testing program will continue on the smaller (600 megawatts), simplified, more passively safe reactors. Resolution of issues with the NRC for the Westinghouse AP-600 and the General Electric Simplified Boiling Water Reactor (SBWR) Plants will continue. The level of funding is reduced when compared to FY 1995 when Congress appropriated an additional \$14 million above the request to cover increased NRC fees for the passive pressurized water reactor. Current schedules for design certifications will permit receipt of the Nuclear Regulatory Commission's certification of all four Advanced Light Water Reactor designs by 1999. The Department plans to continue discussions with NRC concerning certification schedules.

We will continue the industry cost-shared program industry for first-of-a-kind engineering activities to produce Advanced Light Water Reactor (ALWR) designs suitable for commercial standardization. In FY 1993, the General Electric Advanced Boiling Water Reactor (ABWR) and the Westinghouse AP-600 Advanced Pressurized Water Reactor were selected for this program, and detailed design engineering began. During FY 1996, detailed design engineering will be completed for the ABWR and continued for the AP-600 for the remainder of all the major reactor and balance-of-plant systems. Standardized commercial designs, together with the advanced safety features built into these new ALWRs, will resolve problems which burdened the nuclear power industry in the past. With these problems overcome, nuclear power can continue as a choice available in the marketplace for domestic energy. We are also continuing to support resolution of technical issues associated with plant life extension and continued operation of safe existing plants, and advanced reactor severe accident activities to support certification of the passive plant designs.

2. Advanced Reactor Research and Development

Consistent with the FY 1995 Congressional appropriation, the Liquid Metal Reactor design and Integral Fast Reactor (IFR)/Actinide Recycle programs are being terminated. In FY 1996, the Gas Turbine Modular Helium Reactor

program has been recommended for phaseout because of a continuing lack of interest in this technology by the private sector.

B. Nuclear Technology Research and Development

The Office of Nuclear Energy is conducting advanced technology research and development programs such areas as reactor safety, decontamination and decommissioning, and electrometallurgical techniques for the potential treatment of DOE spent nuclear fuels. The spent fuel treatment technology development program is the subject of a National Academy of Science review. Depending on the outcome of this review, this program may be terminated in FY 1996. These programs will be based at the Argonne National Laboratory.

C. Space Power Technologies

The Atomic Energy Act gives the Department responsibility of supporting both civilian and National security requirements for radioisotope and reactor power systems for space applications.

The Advanced Radioisotope Power Systems program will continue to provide the sole capability to develop and produce radioisotope power systems for the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD) space and terrestrial missions. For over 30 years, these maintenance-free power systems have proven to be reliable and capable of producing electrical power for remote applications in excess of ten years and remain the only viable technology to power deep space missions. This program also provides for acquiring and processing the required Plutonium-238 fuel, and all aspects of manufacturing, quality assurance, reliability, and operational safety. In FY 1995, this program will focus on producing three general purpose heat source radioisotope thermoelectric generators for NASA's Cassini mission to be launched in 1997. The Advanced Radioisotope Power Systems FY 1996 budget is \$49.2 million.

D. Termination Costs

The FY 1996 request of \$81.7 million will be used for closeout of the Modular High Temperature Gas Reactor design program and shutdown of unneeded nuclear facilities at the Argonne National Laboratory. Shutdown of the Experimental Breeder Reactor-II (EBR-II) and the Transient Reactor Test Facility (TREAT) at ANL-West began on October 1, 1994. The other facilities at ANL-W including the Fuel Manufacturing Facility, the Analytical Laboratory and the Hot Fuel Examination Facility will be operated as necessary to support the shutdown of EBR-II and the redirected program.

The ANL-West surplus facilities including EBR-II will be placed into a radiologically and industrially safe shutdown condition for eventual transfer to the Assistant Secretary for Environmental Management.

E. International Nuclear Safety Activities

The Department manages a number of programs designed to reduce the National security threat posed by the operation of aging nuclear facilities in the former Soviet Union and Central and Eastern Europe and to promote nuclear safety worldwide. The Department provides technical leadership, expertise and coordination in these areas with international organizations such as the International Atomic Energy Agency and the Nuclear Energy Agency.

One initiative, that has been funded by the Agency for International Development, is a comprehensive program to strengthen safety culture and improve the operation and physical condition of nuclear power plants in countries operating Soviet-designed reactors. A second initiative is aimed at developing replacement power sources for the three remaining plutonium production reactors in Russia. These programs are carried out in accordance with the priorities of the Gore-Chernomyrdin Commission on Economic and Technological Cooperation.

A third initiative is a program to encourage the shutdown of the Chernobyl nuclear power plant by addressing safety, replacement power sources and socio-economic concerns. Finally, the Department cooperates with countries with advanced nuclear programs, such as the United Kingdom and Japan, on matters relating to safety, nonproliferation, and decommissioning.

F. Other Nuclear Energy

Other functions performed by the Office of Nuclear Energy include provision of research grants, fuel supply, and other assistance to U.S. universities; operation of the Test Reactor Area hot cells and related landlord activities; Advanced Test Reactor fusion irradiations; landlord responsibilities at the Oak Ridge site; and program direction and policy and management efforts to oversee all activities of this Office.

G. Isotope Support

The Isotope Support Decision Unit was established last year to support the Isotope Production and Distribution (IP&D) Fund through payments into the Fund for the production and distribution of isotopes that are needed in meeting the National, interest and supporting our health care system.

The total FY 1996 request for this decision unit of \$25.4 million includes \$13.4 million to support: isotope production, processing, distribution and associated services to commercial and research customers, continued programmatic and

financial restructuring of the program. The remaining \$12.0 million is to develop the capability to produce Molybdenum-99 and related medical isotopes. Molybdenum-99 is by far the most frequently used radioactive isotope in medicine. The United States' supply of Molybdenum-99 is currently obtained solely from aging facilities in Canada.

Isotope Production and Distribution Fund

The Department of Energy Isotope Production and Distribution Fund, provides radioactive and stable isotope products and associated services to a wide and varied domestic and international market. The program operates under a revolving fund account and maintains financial integrity through its revenues and funding transferred from the Isotope Support decision unit.

The first mission is to produce and distribute isotopes for research or development, medical diagnoses and therapy, and other applications that are needed in meeting National interest. Charges for these isotopes are to provide reasonable compensation to the Department, while encouraging research, development, and applications of such isotopes.

The second mission is to continue to produce and distribute other isotope products and services that are in demand on a businesslike basis. The Department will evaluate opportunities for the private sector to co-fund or invest in new ventures, and will seek to divest itself from ventures that can be operated profitably by the private sector.

Uranium Supply and Enrichment Activities

This decision unit includes many activities in support of Administration and Congressional objectives. Efforts include the transparency measures program necessary to increase confidence that Russian low enriched uranium purchased by the United States is derived from highly enriched uranium; the technology program to utilize uranium enrichment related technologies; the depleted uranium hexafluoride management program; the nuclear safety upgrade program and other activities in support of the United States Enrichment Corporation; the surveillance and maintenance of the shut down highly enriched uranium facilities; the uranium revitalization initiatives designed to strengthen the domestic uranium industry; and reimbursable work performed in support of the United States Enrichment Corporation.

Accomplishments in FY 1996 are expected to include completion of ten on-site inspections at Russian facilities as part of the transparency measures program; signing of seven technology partnership CRADAs; reducing the HEU stockpile by blending HEU with LEU; and completing forty-five percent of the cylinder restacking efforts in the depleted uranium hexafluoride management program.

Solar and Renewable Energy

In FY 1996, the Department of Energy continues its commitment to developing new energy resources within the Solar and Renewable Energy programs. The Department will support a balanced development and deployment effort on promising renewable energy technologies that will increase the production and use of domestic energy resources, and will also work with industry to strengthen the technology base leading to new products and processes for the commercial market. Program activities range from basic research in universities and National Laboratories to applied research and development with industrial partners to proof-of-concept projects and field evaluation and testing also with industrial partners. A strong and balanced program is proposed for FY 1996 to contribute toward strengthening the Nation's energy security, promoting sustainable energy approaches, and increasing U.S. industrial competitiveness, with the goal of tripling the non-hydropower renewable energy capacity by the year 2000.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Solar and Renewable Energy		
Solar Energy	\$292.2	\$326.4
Geothermal	37.8	37.0
Hydroelectric Systems	4.8	1.0
Hydrogen Research	9.6	7.3
Electric Energy Systems and Storage	44.4	46.9
Policy and Management	4.8	4.8
In-House Energy Management	30.7	28.8
Subtotal, Solar and Renewable Energy	424.3	452.2
Use of Prior Year Balances and Other Adjustments	-6.5	—
Total, Solar and Renewable Energy	<u>\$417.8</u>	<u>\$452.2</u>

Solar Energy

The FY 1996 photovoltaics (PV) program will continue its residential and commercial building applications of photovoltaic technology by incorporating photovoltaic materials directly into roofing materials, windows, and manufactured housing (PV:BONUS). The Photovoltaic Utility-Scale Application project will continue to validate photovoltaic applications for electrical utilities. Both of these programs are heavily cost shared with industry.

At the Nevada Test Site, a task force made up of photovoltaic utilities is expected to recommend actions to establish a Solar Enterprise Zone in FY 1996 and the chartering of a non-profit organization to begin project development, both of which are likely to

require DOE involvement. The Task Force has agreed to focus on a near-term objective of securing a 100-MW project as a first step toward a much larger commercialization effort. In FY 1996, the Department expects to issue a Request for Proposal outlining DOE's support and involvement in this first step; the Request for Proposal will be offered to industry on a competitive basis.

In FY 1996, the Solar Thermal Program's several phased development programs will complete major milestones which will demonstrate the performance, availability, and possible economic viability of dish/Stirling, power tower, and trough systems. These include design validation of 25-kWe dish/Stirling systems, a manufacturing prototype for 7-Kwe dish/Stirling systems, operation of the 10-MWe power tower, and the beginning of significant data output from the trough operations and maintenance reduction program. The culmination of this activity will qualify solar thermal systems for a broad range of utility applications in the late 1990s. In addition, solar thermal systems are considered to be prime candidates for World Bank funding in the next decade.

Other areas of emphasis include using concentrated solar energy to break down toxic organic wastes, supplying process heat to industry; and encouraging exports of technology to developing countries. The goals for Solar Industrial applications include producing Solar Industrial Process Heat at \$5 per million BTU in 2000, and Solar Detoxification at \$3 per thousand gallons of hazardous wastewater treated in 1996.

The development of technologically advanced, higher-efficiency wind turbines is one of the highest priorities of the U.S. wind industry, i.e., the DOE Wind Program. As a result of the Program's public/private partnerships, improvements in the cost of energy and reliability and increased buyer confidence are resulting in the successful penetration of domestic and international bulk power markets. Continued FY 1995/1996 collaborative activities will result in accelerated deployment of wind power plants, increased employment, and a strengthened wind industry infrastructure. The two-year deployment total resulting from program incentives could reach 150 MW.

The DOE/U.S. Department of Agriculture collaboration for integrated biomass feedstock production and advanced power generation systems will exploit near-term market niche opportunities to demonstrate economically and environmentally sustainable, integrated biomass power systems that will benefit rural economic development. These projects will deploy advanced conversion technologies which are being developed by the U.S. industry currently supported by the DOE program, and it will expand world-wide market opportunities for U.S. technologies.

Biomass can also be a major source of alternative transportation fuels. The transportation sector is still 97 percent dependent on oil. The Biomass Fuels program seeks to develop innovative technologies to produce renewable transportation fuels from biomass at competitive costs, without the need for subsidies. The two major research thrusts include biochemical and thermochemical conversion processes. Biochemical conversion research is developing efficient and cost-effective technology for ethanol production, while

thermochemical conversion research is developing competitive biomass technologies for production of methanol, ethers, and biodiesel. The proposed program supports major process development units for ethanol fuel, which are critical to reducing the cost of production, attracting major industrial participation, and decreasing outyear R&D costs. In FY 1996, major goals are to increase ethanol production yields to reduce the delivered price of alcohol fuel by 3¢/gallon and to increase feedstock yields by 0.5 tons per acre.

The solar international program supports the development of fair and competitive international markets for U.S. renewable energy technologies. The Office of Technical and Financial Assistance (OTFA) will continue to support the Committee on Renewable Energy Commerce and Trade (CORECT), an interagency group which maximizes Federal export assistance and will help the renewable energy industry capture the unique opportunities that currently exist worldwide for efficient, clean renewable sources of energy. In FY 1996, there will be an expansion of the Americas 21st Century program to assist Latin and Caribbean countries in the deployment of renewable energy technologies and a new initiative will be undertaken in the Asia/Pacific, African and Eastern Europe markets that will assist in increasing the deployment of renewable energy technologies and concomitantly assist in the development of new U.S. jobs. The number of joint implementation projects assisted will grow by at least 200 percent.

Geothermal

In FY 1996, the program completes several technology development efforts that clearly support significant system cost reductions in the near term, especially with respect to drilling, power plant, and materials technologies. Cross-industry system integration efforts for even greater cost reductions in the midterm, e.g., the National Advanced Drilling and Excavation Technologies (NADET) initiative, are also underway. The improvements are being applied to both domestic and export projects. The National Earth Comfort Program is gaining momentum in its second year, already producing dramatic increases in the rate of geothermal heat pump installations Nationwide.

Hydroelectric Systems

The FY 1996 Hydropower program is aimed at identifying opportunities to make improvements at existing hydroelectric facilities and resolving technical and institutional impediments, such as maintaining and expanding hydroelectric capacity without undesirable environmental impacts. Studies to determine the effectiveness of environmental mitigation practices will be conducted to provide the basis for informed decision making and development of advanced "environmental friendly" turbine design concepts will be continued.

Hydrogen Research

In a collaborative agreement with our Energy Efficiency Office of Transportation Technologies, the Hydrogen Program will demonstrate an optimized hydrogen-fueled internal combustion engine for a hybrid vehicle to validate the increase in efficiency (20

percent) at zero-emissions under the Federal test cycle at Sandia National Laboratory. This collaboration includes efforts at Lawrence Livermore National Laboratory, Los Alamos National Laboratory, the University of Miami, and Baton Corporation.

Electric Energy Systems and Storage

Electric and magnetic fields Research and Public Information Dissemination (EMF RAPID) Program and the electric and magnetic fields Biological Mechanisms Program are the keys to providing complementary scientific information required to assess whether or not exposure to electric and magnetic fields results in the adverse health effects that have been suggested from some epidemiologic studies.

The Transmission and Distribution (T&D) Program, in partnership with utilities and manufacturers, is developing technologies that will provide the capacity, flexibility, and efficiency in the electric power system to enable operation with lower reserve margins to save capital costs, while enabling the full integration of renewable energy generation, distributed storage and the implementation of energy efficiency measures, and other customer services.

In FY 1996, the High Temperature Superconductivity (HTS) Program will begin the second Phase of at least one Superconductivity Partnership Initiative (SPI) Project. The SPI has proven itself as an "engine of innovation" featuring four separate consortia of vertically integrated, non-competitive private companies and pre-competitive development of four different ground-breaking superconducting products:

- Large industrial motors, 1,000 horsepower or greater,
- Electric utility generators, 100 megawatts or greater,
- Three-phase electric transmission cables, and
- Current limiters protecting transmission and distribution systems.

In FY 1996, the Utility Battery Storage Program will develop the Transportable Battery System which will be deployed by utilities at numerous sites across the country to relieve heavily loaded transmission and distribution facilities, thus prolonging the life of existing utility equipment and deferring capital expenditures. The benefits of battery systems for these applications are estimated to be over \$35 billion to the U.S. economy by the year 2010.

Renewable Energy Production Incentive

As established by the Energy Policy Act of 1992, a renewable energy production incentive for cooperative and State-owned utilities was begun in FY 1995. The program provides for payments of 1.5¢/Kwh to these utilities for electricity output from solar, wind, geothermal, and biomass conversion facilities. The incentive is roughly comparable to tax credits currently available to tax paying utilities or other investors, and it is intended to provide market pull for these emerging renewable energy technologies in the public power sector. Within the overall Solar request, \$3 million has been allocated

to the incentive payout program, an amount that may be supplemented by FY 1995 carryover funding.

Global Climate Change

Within the overall Solar request, initiatives have been established to enhance the potential of renewable technologies to supply an increasing portion of U.S. energy needs, while simultaneously improving overall utility sector emission characteristics. In FY 1996, funding is included in the photovoltaics, wind, geothermal, and bio-electric programs to continue the multi-year market deployment effort. Cooperative projects with utilities, power system producers, and consumers will be undertaken to define and/or demonstrate cost-effective applications for emerging, commercially available renewable systems. It is anticipated that the initiative will be continued for an additional three years.

In-House Energy Management

The Department also employs the same energy saving methods and strategies used in the marketplace. The goal of the In-House Energy Management Program is to reduce energy consumption and utility and energy costs for the Department of Energy facilities. The program is structured to survey and study facilities and processes owned by DOE to identify retrofits and modifications which will save energy and have a high return on investment. The retrofit projects that are identified in the program compete for funding on a DOE-wide basis, and are selected to maximize DOE economic returns. In previous years, projects funded by the program had a payback of slightly greater than three years.

In FY 1995, responsibility for In-House Energy Management was transferred from the Office of Field Management to the Office of Energy Efficiency and Renewable Energy; In-House Energy Management will now be a part of the Federal Energy Management Program. Benefits of this transfer include more effective use of Federal resources, such as training and technical assistance; shared information and practical experience between In-House Energy Management and the Federal Energy Management Program; increased coordination on activities such as demonstration of new technologies in Federal facilities; and more visible leadership from DOE to other Federal agencies and the private sector.

Performance measures are to have annual dollar savings greater than \$5 million per year; and for buildings, energy consumption per square foot is to be reduced by at least 1 percent each year.

Power Marketing Administrations

The Power Marketing Administrations (PMAs) assist in the Department's goal of deploying energy resources by marketing electricity generated primarily by Federal hydropower projects. Preference for sale of power is given to public bodies and cooperatives. Revenues from selling power and transmission services of the five PMAs

are used to repay annual operation and maintenance costs, repay the capital investments with interest, and assist capital repayment on irrigation features of certain projects.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Power Marketing Administrations		
Alaska	\$6.5	\$4.3
Bonneville (non-add)	(147.1)	(-107.3)
Southeastern	30.5	29.9
Southwestern	30.6	30.3
Western Area	334.8	319.9
Colorado River Basin Power Marketing Fund	—	-10.0
Subtotal, Power Marketing Administrations	402.4	374.4
Use of Prior Year Balances and Other Adjustments	-122.4	-18.6
Total, Power Marketing Administrations	<u>\$280.0</u>	<u>\$355.8</u>

Alaska

The Alaska Power Administration (APA) owns, operates, maintains, and markets power from the two Federal hydroelectric projects in Alaska. To measure the effectiveness of the agency's programs and operations, APA uses seven performance indicators. Four of these indicators monitor financial activities, two track generation and transmission systems reliability, and one shows the effectiveness of the safety program.

Purchase agreements have been successfully negotiated for the sale of the two projects. The agreements attempt to balance taxpayer and ratepayer interests by providing up front most of the present value of the future project net revenues to the Treasury without requiring significant rate increases. Authorizing legislation was introduced in the 103rd Congress, passed by the House, and reported out of the Senate Energy and Natural Resources Committee.

Bonneville

Bonneville Power Administration (BPA) is the Federal electric power marketing agency in the Pacific Northwest. BPA provides about 80 percent of the region's electric power transmission capacity. Operating on a self-financed revolving fund basis, BPA does not require appropriations to finance its day-to-day operations. It does, however, require borrowing authority for its capital investment activities. In FY 1996, these include increased conservation investments, spending to maintain transmission system reliability and reinforce service to areas experiencing load growth, enhanced efforts to replace obsolete and maintenance-intensive equipment, construction of fish protection and enhancement facilities, and direct funding of improvement and replacements at four

Bureau of Reclamation hydrogeneration projects. In FY 1996, \$378.0 million is expected to be obligated for capital investment, a decrease of \$69.8 million over FY 1995 capital obligations of \$447.8 million. These numbers reflect Bonneville's actual capital program levels, and differ from the total budget authority estimates of \$649.3 million in FY 1995 and \$107.6 million in FY 1996. This difference reflects the use, or creation of deferred borrowing. The capital investments support Bonneville's performance measures, which focus on meeting customer load through a stable power supply, enhanced system safety, transmission system performance, cost-effective conservation resource acquisitions, and achieving Bonneville's fish and wildlife protection mission.

The decrease in estimated net budget authority for the Bonneville Power Administration between FY 1995 (\$147.1 million) and FY 1996 (-\$107.3 million) is due primarily to a reduced level of Federal debt repayment, as well as an increase in offsetting collections enabling Bonneville to increase deferred borrowing. Federal debt repayment decreases because FY 1995 included a one-time, unscheduled amortization payment received from non-Federal participants in the Third AC Intertie.

Southeastern

Power generated at 23 Federal hydroelectric generating plants in an eleven-State area is marketed by the Southeastern Power Administration (Southeastern). Southeastern sells wholesale power primarily to publicly and cooperatively owned electric distribution utilities using wheeling agreements with the region's large private utilities to provide firm power to its customers. Southeastern does not own or operate any transmission facilities. During FY 1996, a program funding level of \$29.9 million is required for operations and maintenance costs and purchase power and wheeling charges. This includes \$10.0 million in carryover funds. Performance indicators have been developed by Southeastern. These indicators measure financial, operating, and rate performance by measuring the ratio of principal payments to Federal investment, capacity commitments, transmission costs, and average power costs.

Southwestern

The Southwestern Power Administration (Southwestern) operates within a six-State area as a marketing agent for hydroelectric power produced at 24 U.S. Army Corps of Engineers dams, selling wholesale power primarily to publicly and cooperatively owned electric distribution utilities. It also operates and maintains transmission lines, substations and switching stations. A program funding level of \$30.3 million for FY 1996 is requested by Southwestern for Operations and Maintenance, Purchase Power and Wheeling, and Construction: \$29.8 million is derived from new budget authority and \$500 thousand carried over from prior years. The FY 1996 program focuses on maintaining an aging transmission system to preserve required utility reliability. The request, which is approximately \$300 thousand less than the FY 1995 level, reflects Southwestern's efforts to reduce costs and utilize energy banks for direct power purchases. Performance indicators have been developed by Southwestern to reflect a utility business operation and measure its mission objective to market and deliver

hydroelectric power. Measurements will evaluate performance in the areas of marketing, repayment, safety, competitiveness and reliability.

Western

The Western Area Power Administration (Western) markets electric power in 15 central and western States from Federally-owned power plants operated primarily by the Bureau of Reclamation, U.S. Army Corps of Engineers, and the International Boundary and Water Commission. The budget request for Western covers construction and rehabilitation of power transmission facilities, extensive operation and maintenance activities for power marketing and transmission, purchase power and wheeling expenses to meet contractual obligations for the delivery of power, funding environmental activities associated with reclamation projects in Utah, and O&M activities of the hydroelectric facilities at the Falcon and Amistad Dams. Western's activities are primarily funded through a combination of appropriated funds and revenue collections. The FY 1996 program funding level is \$319.9 million. Of this amount, \$311.9 is new budget authority of which \$4.6 million is permanent budget authority transferred from the Department of Interior, and \$8.0 million is use of prior year funds.

Performance measures for FY 1996 include: operation and maintenance of 16,698 miles of transmission lines and 273 substations; exceeding the National Electric Reliability Council Area Control Error performance standard of 90 percent; rehabilitating 25 substations.

Preparing for Energy Emergencies

The second element of securing the Nation's future energy supplies is being prepared for energy emergencies. The Department of Energy has a number of programs in place which serve to reduce the vulnerability of the U.S. to energy emergencies, such as energy supply disruptions, and foster international cooperation in global energy issues.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Preparing for Energy Emergencies		
Strategic Petroleum Reserve	\$243.7	\$312.7
Emergency Preparedness	8.3	82.3
Naval Petroleum and Oil Shale Reserves	187.0	101.0
Subtotal, Preparing for Energy Emergencies	439.0	421.9
Use of Prior Year Balances and Other Adjustments	-107.7	-287.0
Total, Preparing for Energy Emergencies	\$331.3	\$134.9

Strategic Petroleum Reserve

The Strategic Petroleum Reserve was created in 1975 to provide the United States with adequate strategic and economic protection against severe oil supply disruptions. The Strategic Petroleum Reserve program is currently directed toward providing for the storage of 750 million barrels of crude oil in underground salt caverns at five sites located in the Gulf Coast area and connected to major private sector distribution systems. However, the Department has announced the planned decommissioning of the Weeks Island site, which will reduce the available capacity of the Reserve to 680 million barrels.

The FY 1996 budget request continues operations and maintenance activities at a prudent, responsible level to assure a cost effective capability to respond to a Presidential order to drawdown the Reserve. At the end of December 1994, the Strategic Petroleum Reserve crude oil inventory was 591.7 million barrels and the inventory by the end of FY 1996 is projected to be 585 million barrels.

The FY 1996 budget proposes to continue suspension of oil acquisition activities as one of the Administration's savings initiatives aimed at controlling the deficit. Actions to resolve problems associated with elevated oil temperatures and higher than normal gas content in some of the crude oil will continue. The FY 1996 budget request continues the comprehensive Life Extension Program initiated in FY 1992 to extend the useful life of critical facilities and systems to the year 2025 by streamlining existing operating systems and using advanced systems technology to improve reliability while reducing life cycle costs. The request also provides funds for the planned decommissioning of the Weeks Island site. FY 1996 is proposed to be financed by transferring \$187.0 million from balances in the SPR Petroleum Account to the Strategic Petroleum Reserve Account, by an asset sale of \$100 million worth of oil stored at the Weeks Island site plus new budget authority of \$25.7 million.

Emergency Preparedness

The Emergency Preparedness program leads the Department's efforts to develop and direct energy emergency preparedness planning, operational, and response programs to meet the goal of reducing U.S. vulnerability to the adverse impacts of domestic and international supply disruptions. The program is organized under both the Office of Intelligence and National Security (\$4.7 million) and the Office of Policy, Planning and Program Evaluation (\$3.6 Million).

To achieve this goal during FY 1996, the Emergency Preparedness program will continue to develop reliable and flexible systems which detect emergencies, assess their severity and provide for effective responses; develop and test plans, procedures, and capabilities to respond to emergencies; determine vulnerabilities to supply disruptions that could result in significant adverse impacts to the U.S.; and determine which policy options to adopt and response actions to implement.

The Emergency Preparedness program's performance measures include: to provide assessment within 2 hours after identification of potential emergency; and to implement correct actions to operating procedures and systems within 60 days after completion of energy emergency simulation exercises.

Naval Petroleum and Oil Shale Reserves

The Naval Petroleum Reserve is one of several assets within the Department of Energy that support savings of \$10.6 billion over the 5 year phase of reinventing government. The Administration proposes to operate the Naval Petroleum Reserves in a "caretaker" status and to corporatize and sell, or lease the Reserves in FY 1997. Legislation privatizing the Reserve will be submitted at a later date. The FY 1996 Congressional Budget request is \$101 million, a decrease of \$86.0 million from the FY 1995 Appropriation. This request is based on sale in FY 1997, and selling the Naval Oil Shale Reserves gas wells and leasing unexplored land in FY 1996.

Science and Technology

The Department of Energy has a significant role to play in maintaining this Nation's technological preeminence and its economic performance in an increasingly competitive world economy. The Department funds a substantial portion of the Nation's basic research, and has committed itself to improving science and mathematics education in the United States. Technology transfer programs help advance technologies that industry has identified as having commercial value to the marketplace. The budgets for science and mathematics education programs and for technology transfer are included in their parent programs described in this and other sections of the Budget Overview. Amounts for these activities are displayed below, but are not added to the total to avoid double counting.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Science and Technology		
Fundamental Science Research	\$2,708.1	\$2,810.5
Technical Information Management Program	16.1	17.4
Galvin Task Force Reductions (undistributed)	—	-50.0
Total, Science and Technology	\$2,724.2	\$2,777.9

Fundamental Science Research

Maintaining scientific and technological preeminence is vital to maintaining U.S. economic performance in the world economy. Many of the products and processes which will be important in the future will originate from the research and development being carried out in the Department's National Laboratories and our contractors' facilities. Major program areas which contribute to the goal of maintaining our scientific and technological competitiveness are shown in the following table.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Fundamental Science Research		
High Energy Physics	\$642.1	\$685.6
Nuclear Physics	331.5	321.1
Basic Energy Sciences	733.9	811.4
Advanced Neutron Source	20.8	—
Biological and Environmental Research	436.6	431.7
Fusion Energy	368.4	366.0
Multiprogram Energy Laboratories—Facilities Support. .	43.0	51.0
University and Science Education	66.0	55.4
Laboratory Technology Transfer	56.9	58.8
Analysis and Program Direction	28.5	26.3
Technology Partnerships	—	3.2
Subtotal, Fundamental Science Research	2,727.7	2,810.5
Use of Prior Year Balances	-19.6	—
Total, Fundamental Science Research	<u>\$2,708.1</u>	<u>\$2,810.5</u>

The Department will use the following four objectives as criteria to evaluate the performance of its scientific research program:

- **High Quality Research.** The Department will continue to use the evaluations of expert advisory committees, peer reviews, and recognition within the scientific community to ensure that its programs are conducting world-class research.
- **Relevance to DOE Missions and National Needs.** Science and Technology programs are expected to support one or more of the following objectives: sustained advancement of fundamental science; critical support of energy and other civilian technology development programs; cooperation with industry or government agencies; and support for the needs of a diverse scientific user community from industry, academia, and government laboratories.
- **Construction and Operation of Research Facilities that Meet User Needs.** All of the Department's research facilities are expected to achieve performance specifications; meet schedule and cost milestones; operate cutting-edge facilities in a reliable manner; maintain and upgrade facilities as necessary at reasonable and defensible cost; and secure strong and enthusiastic endorsement among user organizations.

- **Effective Research Management.** Departmental science and technology programs are expected to operate on the basis of well-developed research plans; meet budget projections; efficiently identify and overcome technical problems; and make effective decisions in managing and, when necessary, redirecting or eliminating projects.

It has always been difficult to evaluate the quality of scientific research by quantitative indicators. Therefore, performance in the budget submission may be measured qualitatively when quantitative measures are inappropriate.

The Department of Energy budget proposal includes a Science Facilities Initiative that will lead to more effective use of important National resources that represent large Federal investments.

The Department of Energy operates many large, state-of-the-art basic research facilities used for specialized energy, environmental, medical, physics and industrial research. Such facilities include high energy and nuclear physics accelerators, neutron and synchrotron light sources, and smaller facilities such as electron microscopy centers. About fifteen thousand industry, university and government-sponsored scientists conduct unique, cutting-edge experiments at Department of Energy basic research facilities each year. In many research areas, such as materials science, United States industry relies heavily upon the Department's facilities to conduct experiments that would otherwise be too expensive, or even impossible to carry out, in the United States. The demand for operating time at Department of Energy basic research facilities has increased dramatically and in some cases has exceeded availability by a factor of two to three. The number of user groups conducting research at Department of Energy synchrotron, neutron, and electron microscopy research facilities alone has increased from 1,500 to 4,500 since 1987.

It is clear that the Department's research facilities are currently underutilized. To increase operating time and user support at the existing unique Department of Energy scientific user facilities (accelerators, research reactors, synchrotron, light sources, etc.) in the Basic Energy Sciences, High Energy Physics, and Nuclear Physics programs, an additional \$100 million is provided. This recognizes the Administration's commitment to increase funding for fundamental science as articulated in Science in the National Interest, where the President pledged to make investment in science and its infrastructure a top priority. This investment will significantly and immediately increase research time available to thousands of scientists in universities, Federal agencies, and United States industry, thereby leveraging both Federally and privately sponsored research.

It is estimated that this \$100 million, which represents an increase for Basic Energy Sciences, High Energy Physics, and Nuclear Physics user facility funding of about 10%, will increase user facility operations about 30%.

High Energy Physics

High Energy Physics research is aimed at understanding the nature of matter and energy at the most fundamental level and the basic forces which govern all processes in nature. The program is centered on an active program of both experimental and theoretical research. The ability to carry out physics research at the forefront of knowledge is critically dependent on the capabilities of the Department's particle accelerators, colliding beam facilities and particle detectors. Thus the program also provides for the operation and upgrading of existing accelerators and detectors, and, as needed, for the construction of new facilities and detectors. Experimentation in high energy physics requires state-of-the-art technology in such areas as high-speed computing, fast electronics, superconducting magnets, and other high technology areas. Moreover, high energy physics has been the basis for many advances in applying accelerator technology to such important areas as medical diagnostics.

Funding for FY 1996 High Energy Physics programs is \$685.5 million. The High Energy Physics request accommodates the recommendations of the Drell Panel review of the program and provides \$15 million as part of the Scientific Facilities Utilization Initiative. This will provide for increased facility utilization to reduce the backlog of high quality scientific research proposals. Of this \$685.5 million request, \$147.2 million is provided to support research for university and laboratory based groups conducting experimental and theoretical research; \$280.1 million is provided for facility operations; and \$67.4 million is provided for High Energy Physics technology which will provide the technological base for maintaining and improving the scientific effectiveness, reliability and efficiency of existing and future facilities. Capital equipment is funded at \$63.2 million. Construction projects are included at \$127.6 million and provide \$13.8 million for general plant projects, \$9.8 million for accelerator improvements, \$52.0 million for continuing construction of the Fermilab Main Injector and \$52.0 million for the B-Factory, a Presidential initiative at the Stanford Linear Accelerator Center.

Nuclear Physics

The objective of Nuclear Physics research is to understand the structure of atomic nuclei and the fundamental forces required to hold nuclei together. The program is focused on an active experimental research program and the design and fabrication of sophisticated detectors, coupled with the development of creative theoretical concepts and support of other disciplines based on nuclear technology. The construction, operation, and maintenance of accelerator facilities is critical for providing particle beams for nuclear physics experiments. In order to maintain our world leadership position in nuclear physics, \$70.0 million is provided to operate the completed Continuous Electron Beam Accelerator Facility (CEBAF) and continue construction of the Relativistic Heavy Ion Collider (RHIC).

Funding for the Nuclear Physics programs in FY 1996 is \$321.1 million. The Nuclear Physics request includes \$25.0 million for the Scientific Facilities Utilization enhancement. This will allow high priority scientific research to be conducted at the user

facilities that are operating below their optimum capacity. Operating expense program support is \$213.3 million, which includes funding for the subprogram activities of Medium Energy Physics (\$103.9 million), Heavy Ion Physics (\$66.8 million), Low Energy Physics (\$27.1 million), and Nuclear Theory (\$15.5 million). Capital equipment requirements are funded at \$28.0 million.

Basic Energy Sciences

The Basic Energy Sciences (BES) program provides the foundation for new technologies and improvements to existing technologies which are crucial to achieving Departmental goals and the provisions of the Energy Policy Act of 1992. In the pursuit of its research goals, the BES program designs, constructs, and operates large complex scientific facilities and makes them available to the scientific community at large. The two main BES program goals are to conduct energy-related research and to provide scientific facilities for this research to Departmental and other users.

The Basic Energy Sciences program is grouped into six major areas of research. In FY 1996, funding is distributed as follows: materials sciences (\$348.3 million), including \$8.0 million for research and development leading to the conceptual design of a spallation neutron source to meet the Nation's need for a next generation neutron scattering source, chemical sciences (\$181.6 million), applied mathematical sciences (\$108.7 million), engineering and geosciences (\$40.0 million), energy biosciences (\$29.5 million), and advanced energy projects (\$12.0 million). The Oak Ridge National Laboratory is the preferred site for the neutron source. Basic Energy Sciences has a heavy involvement in major scientific user facilities: the High Flux Beam Reactor and the National Synchrotron Light Source at Brookhaven National Laboratory; the Combustion Research Facility at Sandia National Laboratories; the High Flux Isotope Reactor and the Radiochemical Engineering Development Center at Oak Ridge National Laboratory; the Stanford Synchrotron Radiation Laboratory at Stanford University; the Intense Pulsed Neutron Source at Argonne National Laboratory; the Advanced Light Source at Lawrence Berkeley Laboratory; and the Los Alamos Neutron Scattering Center at Los Alamos National Laboratory. Operation of these major facilities accounts for \$242.0 million of the Basic Energy Sciences funding requirements. The Basic Energy Sciences request includes \$60.0 million for the Scientific User Facilities Initiative enhancement to allow high priority research to be conducted at these user facilities that are oversubscribed. Also, included in the request is \$10.0 million required for program and management support staff. In addition to operating costs, \$57.0 million is requested for capital equipment.

The FY 1996 request includes \$3.2 million for the final construction phase of the 6-7 GeV Synchrotron Radiation Source at Argonne National Laboratory and \$2.0 million for the Combustion Research Facility, Phase II, at Sandia National Laboratories, Livermore. Other construction funding includes \$12.9 million for accelerator improvement projects and \$6.3 million for general plant projects.

Advanced Neutron Source

No funds are included in the FY 1996 request for the Advanced Neutron Source since the Administration proposes to terminate the project because of its high cost.

Biological and Environmental Research

The Biological and Environmental Research (BER) program provides the scientific foundation for understanding and anticipating the long-term health and environmental consequences of energy use and development, and for solving major biomedical and environmental problems.

Operating expenses for BER FY 1996 encompass several areas of scientific research including: analytical technology research (\$8.9 million), involving the development of advanced radiation dosimetry and instrumentation technology; environmental research (\$50.1 million), including atmospheric, marine, terrestrial, and ecosystem research activities; health effects research (\$33.1 million), consisting of investigating the health impact of radiation and energy related chemical exposure; general life sciences research (\$113.6 million), entailing the development of fundamental biological information and technologies and biotechnology and biomedical science, including the operating expenses for human genome research; medical application research (\$38.9 million), pertaining to the development of advanced techniques for the application of radiation and radionuclides for diagnosis and therapy; and Carbon Dioxide Research (\$88.4 million). Funding for program direction activities (\$7.6 million) is also provided.

In addition to operating expenses, support for capital equipment (\$24.0 million) is also provided. Construction for BER includes continued funding for the following projects: General Plant Projects (\$4.5 million); Human Genome Laboratory at Lawrence Berkeley Laboratory (\$5.7 million); Structural Biology Center at Argonne National Laboratory (\$4.3 million); Advanced Light Source Structural Biology Support Facilities at Lawrence Berkeley Laboratory (\$2.6 million); and the Environmental and Molecular Science Laboratory at Pacific National Laboratory (\$50.0 million).

A major element of the Biological and Environmental Research operating program is directed toward gaining a better understanding of global change. The Biological and Environmental Research global climate change research program (\$88.4 million operating expenses and \$9.3 million capital equipment) is an integral part of the U.S. Global Change Research Program (USGCRP) which is developed and coordinated by the Committee on Environment and Natural Resources (CENR). Nine agencies have joined forces to create the U.S. Global Change Research Program which has become a model of interagency cooperation and international collaboration to address this potentially serious environmental problem.

Another important element of the BER program is the Human Genome Project (HGP) (\$78.5 million). Using modern biology and technology, HGP helps to evaluate the effects of low doses of exposure to energy-related agents. In addition, HGP exploits the

multidisciplinary capabilities of its National Laboratories to develop the biological research resources and the technologies needed to analyze the entire human genome at the molecular level within the next ten to fifteen years. This new molecular-level information will enable the biomedical, microbiological, and biotechnology communities to develop new resources and technologies.

The Department's HGP program is planned and carried out in coordination with the National Institutes of Health (NIH). Departmental research focuses on developing capabilities and tools, and constructing physical maps and deoxyribonucleic acid (DNA) sequences of human chromosomes. The NIH effort is oriented towards genetic mapping and characterizing disease-related genes by exploiting both human and non-human model systems. The DOE program is carried out primarily in the National Laboratories and, to a lesser extent, in the universities, while the NIH program is focused in the academic community.

Fusion Energy

Fusion continues to offer the promise of a safe, environmentally attractive, secure, and competitively-priced source of energy. Operation of fusion power plants would not contribute to acid rain or global warming problems and the deuterium fuel required for fusion is plentiful and could be readily obtained from sea water, and the other fuel, tritium, can be produced within the fusion power plants from lithium.

The FY 1996 budget request of \$366.0 million allows us to focus on the most critical scientific and technological issues which must be resolved in order to achieve the promise of fusion. These issues include ignition physics, fusion nuclear technology, magnetic confinement configuration optimization, and low activation materials development.

The Magnetic Fusion Energy budget provides for a concentrated effort on the tokamak design concept and on an integrated international approach to demonstrate the scientific and technological feasibility of fusion power. Four essential elements of the fusion plan are all supported by the FY 1996 budget. The first is completing the analysis of the deuterium-tritium (D-T) experiments in the Tokamak Fusion Test Reactor (TFTR) at the Princeton Plasma Physics Laboratory (PPPL). TFTR is the first program to perform extensive D-T experiments that provide important data on the effects of fusion products on fusion fuel. Recently, deuterium-tritium experiments in TFTR were successfully conducted, resulting in production of over 10 million watts of fusion power. This represents a new world record and is a significant milestone towards achieving the scientific and technical feasibility. The second element is U.S. participation in the engineering design phase of the International Thermonuclear Experimental Reactor (ITER) project. The purpose of ITER will be to demonstrate the scientific and technological feasibility of fusion. An engineering design agreement was signed in 1992 between the U.S. and Japan, the European Community and the Russian Federation. The third element is to construct an experimental facility to explore the physics of improved power plant concepts that could lead to a more efficient and, therefore, a more attractive

demonstration power plant. The Tokamak Physics Experiment (TPX) will have the capability to operate for long pulses and will feature advanced tokamak operating modes. TPX will be the first new major U.S. fusion research facility built since the present generation of tokamaks were designed in the mid-1970s. It will replace TFTR and re-use much of its facilities and equipment. Conceptual design is completed and engineering design began in FY 1994. Funds are included for TPX construction in FY 1996, pending review and recommendations by the President's Council of Advisors on Science and Technology. The fourth element is a strong base physics and technology research program required to support ITER, TPX, and a demonstration power plant.

Multiprogram Energy Laboratories — Facilities Support

The goal of the Multiprogram Energy Laboratories — Facilities Support program is to provide for the ongoing rehabilitation, upgrade, and replacement of general purpose infrastructure support facilities necessary to the continued safe, cost effective, and environmentally responsible operation of the Department's multi-program laboratories. During FY 1996, the program will fund activities at Argonne National Laboratory, Brookhaven National Laboratory, Lawrence Berkeley Laboratory, Oak Ridge National Laboratory (ORNL), Pacific Northwest Laboratory, and Oak Ridge Institute of Science and Education (ORISE) (\$51.0 million).

University and Science Education

The Office of Science Education and Technical Information, through its University and Science Education program, manages a number of university programs, most of which are described in the following section on Education and Training. Other programs support efforts to strengthen university capability to perform long-range research and development. One subprogram, University Research Instrumentation (URI), provides competitive support for the acquisition of state-of-the-art research instrumentation by DOE-sponsored university researchers. Another subprogram, University Reactor Fuel Assistance, supports refueling and related activities for university nuclear research and training reactors including the continued conversion of university reactors to Low Enriched Uranium (LEU) fuel.

Analysis and Program Direction

The Energy Research Analyses (ERA) program arranges and conducts independent technical assessments, staffed by outside experts, on the Department's research program. Project-by-project evaluations of ongoing research programs, assessments of future research needs by program, and assessments of topics of special interest are performed. These assessments are managed by the Office of Energy Research to fulfill the legislated responsibility of the Director to advise the Secretary on the agency's research and development programs.

Program direction provides the staffing and associated funding to provide overall direction of programs of the Office of Energy Research.

Technology Partnerships

The new Office of the Deputy Under Secretary for Technology Partnerships and Economic Competitiveness was established to coordinate and facilitate the Department's technology partnership activities. The Department will ensure that all cost-shared cooperative research and development partnerships support departmental missions and will proactively seek to work in collaboration with the private sector whenever it benefits the Department's missions. The Department will also make its resources and capabilities available to the private sector in a manner that is fair and does not inappropriately compete with the private sector. Special efforts will be made to ensure access by small and disadvantaged businesses.

Education and Training

The Department's science, mathematics, and engineering education and training programs are an essential component of the overall Federal commitment to ensuring the Nation's continued international economic and technological competitiveness. Future success in meeting the Department's science, energy and defense research and development missions is also heavily dependent on the quantity and quality of the scientific and technical work force.

For FY 1996, the Department's science, mathematics, and engineering education program closely tracks the overall Federal priorities for support for precollege, undergraduate, and graduate level student and faculty programs. The Department's support for science education is provided through nearly all program offices, with the largest contribution from the Office of Science Education and Technical Information, which has the responsibility to coordinate educational literatures for the Department.

The Office of University and Science Education Program in the Office of Science Education and Technical Information has three major program efforts primarily devoted to student and faculty programs, evaluation and systemic reforms, and public science literacy and educational technology science literacy efforts. The Office of University and Science Education Programs support precollege student and teacher research and training at the Department's National Laboratories and research facilities. In addition, a number of formal partnerships have been established between Departmental facilities and rural and urban school systems to support long-term, systemic reform in math/science education. Particular emphasis is placed in all these efforts to encourage more young people, specifically including under-represented women and minorities, to pursue energy-related scientific and technical careers. At the university level, opportunities are provided for faculty members and undergraduate and graduate students to conduct advanced research at Departmental facilities. Many of the students supported at the university level were also involved in one or more Department sponsored precollege activities.

The Office of Environmental Restoration and Waste Management provides support for the development of new undergraduate level education and curriculum development programs on environmental remediation issues and topics. Support is also provided for undergraduate scholarships in disciplines related to environmental remediation to encourage more students to pursue careers in these critical fields. This support also includes funding for regional partnerships among university consortia, laboratories and private industry to develop joint research and education initiatives on environmental remediation topics and issues.

At the graduate level, support is provided for pre- and postdoctoral research fellowship awards by the four major program offices in the Office of Energy Research. A continued initiative is the postdoctoral fellowship program that will provide ten 3-year awards in physical sciences, engineering and mathematics. Additional graduate research fellowships in designated disciplines and research areas are also provided by the Office of Nuclear Energy, the Office of Environmental Restoration and Waste Management, the Office of Civilian Radioactive Waste Management, and the Office of Environment, Safety and Health.

Technology Transfer

Technology transfer activities consist primarily of the Department's technology partnerships with industry, universities, and other organizations. These partnerships provide benefits to both the Department's missions and to its partners. The partnerships support the Department's missions by enabling scientists and technicians to gain knowledge or ideas from working with the private sector and by having the private sector share in the cost of research and development needed by the Department. They support the Nation's economic well-being by transferring useful knowledge or technology generated by the Department to the private sector, and by supporting the development of technologies that serve industrial as well as Departmental mission needs. The Administration strongly supports the Department's technology transfer activities.

Many partnerships with the private sector take the form of Cooperative Research and Development Agreements (CRADAs). The FY 1996 budget contains three budget line items valued at \$300.2 million, specifically identified for CRADAs. These include the Technology Integration line item within Environmental Management (\$12.0 million), the dual-benefit Technology Transfer program in Defense Programs (\$229.4 million), and the Laboratory Technology Transfer program in Energy Research (\$58.8 million). We anticipate that this funding will support more than 1400 new and existing CRADAs in FY 1996. These CRADAs are highly leveraged by industry, with industry providing over 55 percent of the funding. We expect over 30 percent of new CRADAs to be with small businesses. An increasing amount of the work is conducted with industry consortia and provides benefit to entire industrial sectors, as well as to the Department.

The line item funding, however, does not encompass the full magnitude of the Department's technology transfer activities. Funding for our direct research programs supports the majority of these activities, and includes support for cost-shared projects, other cooperative agreements, the Federal Laboratory Consortium, R&D consortia, scientific user facilities, personnel exchanges, and other activities. The applied research programs, such as Fossil Energy and Energy Efficiency and Renewable Energy, frequently incorporate technology transfer directly into their research programs. The dollar value of these activities substantially exceeds the amount discussed above for line item funding for technology transfer. In addition, each DOE laboratory has an Office of Research and Technology Assessment (ORTA), or equivalent, to oversee its technology transfer program, and each DOE field office and the Department's Office of General Counsel also devotes resources to technology transfer.

Technical Information Management Program

The budget request of \$17.5M provides support at a staffing level of 167 FTEs (\$10.2M) and contractual services and supplies (\$5.2M) to continue the management and dissemination of worldwide scientific and technical information resulting in part from the Department of Energy's (DOE) multi-billion dollar research and development program. Funding supports the implementation of technologies to make information readily available and more easily accessible by the DOE research community, U. S. industry, and the public. Funding also ensures the continued protection of information related to National security.

National Security

The end of the Cold War and the collapse of the Soviet Union caused profound change to the nature of the Department of Energy's nuclear weapons complex and National security activities. The Department's National security activities are being transformed from an emphasis on weapons production to stockpile stewardship—an important contribution to reduce the nuclear danger in a still risky and chaotic world. The Department will continue to fulfill its primary mission of maintenance of nuclear weapons technology and competence for the Nation's nuclear deterrent through the Stockpile Stewardship and Stockpile Management programs. Other key missions involve: reducing nuclear stockpiles by safely dismantling nuclear weapons and disposition of the surplus fissile materials; enhancing the technology infrastructure and core competencies for execution of the National security mission while assisting industrial competitiveness; and transforming the DOE National security infrastructure to meet all current and future requirements. The Department will continue its expansion of the nuclear weapon nonproliferation program and provide additional support for current and prospective arms agreements. The Naval Reactors program will continue to develop an advanced nuclear reactor plant intended for the Navy's new attack submarine.

National Security	FY 1995 Approp.	FY 1996 Request
Weapons Stockpile Stewardship	\$1,457.0	\$1,599.8
Weapons Stockpile Management	1,759.6	1,904.0
Weapons Program Direction	159.3	137.1
Nonproliferation & Verification R&D	226.0	226.1
Arms Control	76.8	162.4
Intelligence	43.1	42.3
Nuclear Safeguards and Security	88.8	89.5
Security Investigations	33.4	33.2
Worker & Community Transition Adjustment.	115.0	100.0
Fissile Materials Disposition	50.0	70.0
Naval Reactors	723.6	682.2
Subtotal, National Security	4,732.6	5,046.6
Streamline DOE Contractors	—	-25.0
Use of Prior Year Balances and Other	-204.2	-99.3
Total, National Security	<u>\$4,528.4</u>	<u>\$4,922.3</u>

Weapons Stockpile Stewardship

The mission of the Weapons Stockpile Stewardship program is to sustain the safety and reliability of the nuclear weapons stockpile while beginning to replace the confidence provided by underground nuclear testing with a science-based understanding of nuclear weapons. Formerly the Weapons Research, Development, and Testing programs, the Stockpile Stewardship Program will make extensive use of past nuclear test data in combination with future, non-nuclear test data and computational modeling, experimental facilities, and simulators to further a comprehensive understanding of the behavior of nuclear weapons. The Core Stockpile Stewardship program provides for the physical and intellectual infrastructure required for the science-based stewardship program at the three defense labs and maintains the Nevada Test Site in a state of readiness to conduct an underground nuclear test within 3 years, if necessary. Core Stockpile Stewardship includes first year funding for three major initiatives: the Accelerated Strategic Computing Initiative; Defense Programs support for the Los Alamos Neutron Scattering Center (LANSCE); and the National Ignition Facility (NIF) in the Inertial Confinement Fusion (ICF) program. The ICF program is maintained at a level to promote the application of ICF technology in support of Stockpile Stewardship objectives, such as laboratory experimentation and theoretical studies into weapons physics and weapons effects testing. Technology transfer activities are maintained in the FY 1996 budget to promote and facilitate the transfer of unclassified, non-sensitive, dual-use technology from the weapons complex facilities to the private sector and to support the Presidential commitment to the New Generation Vehicle Initiative.

Examples of performance measures in this category include: progress in reanalyzing with today's technology older underground testing data to yield new information for stockpile stewardship; effectiveness of programs to train and mentor scientists, engineers, and technicians to ensure a cadre of future weapons experts; variance from the schedule for experiments to assess the reliability and safety of all weapons and for tests which make up the stockpile surveillance program; time required to resume underground nuclear testing, if needed; quality of technology transfer program as measured by review groups; the number of partnership proposals and the processing times for those proposals; the quality of the technical program as measured by citations, including the *Industrial Review* "Top 100" and other awards; and the number of technologies transferred from the weapons program to other Departmental programs.

Weapons Stockpile Management

The Stockpile Management program encompasses the production, maintenance, and surveillance of those nuclear weapons specified in the Nuclear Weapons Stockpile Plan, which is jointly developed by the Department of Defense and Department of Energy and approved annually by the President. Although there are no requirements for any new weapons builds throughout the planning period, maintenance and surveillance of the stockpile, as well as dismantlement and disposal activities on weapons returned from

the stockpile continue. The Stockpile Management program also supports activities aimed at maintaining long-term competence in key manufacturing processes and to develop and demonstrate production capability for improved surety components. Transition of Defense Program's surplus facilities at Rocky Flats, Mound, and Pinellas to Environmental Restoration and Waste Management (EM) are planned to be completed by the end of FY 1995. Activities to bring the Stockpile Management complex into compliance with modern environmental, safety, and health standards continue. Radiological/Nuclear Accident Response activities support maintenance of DOE's technical and operational capabilities for responding to radiological accidents/incidents worldwide. Materials Surveillance and Technical Support activities include: processing, stabilization, storage, handling, shipping, receiving, safeguarding, control, accountability, and disposition of surplus nuclear materials at former Defense Program facilities that have been transferred to EM. The FY 1996 Reconfiguration efforts focus on remaining activity transfers and qualifying production capability at the receiver sites for nonnuclear reconfiguration only. The core program supports a number of major activities that include: (1) warhead disassembly; (2) stockpile evaluation program; (3) repairing or replacing limited life components as needed; (4) upgrading to improve stockpile safety, security, and reliability. The Tritium Source program will provide an analysis of alternative sites and technologies for a new assured tritium source to fulfill national security requirements. The technology alternatives for a new tritium supply include: Light Water Reactor, Heavy Water Reactor, High Temperature Modular Gas-Cooled Reactor, and a particle accelerator. FY 1996 funding will be used to initiate a project to provide a new assured tritium source, either a reactor or an accelerator. The Secretarial ROD is expected November 1995. Prior to FY 1996, Programmatic Environmental Impact Statement (PEIS) and support activities were included in the Program Support portion of Reconfiguration.

Examples of performance measures for stockpile management include: variance from the schedules for stockpile surveillance evaluations and regular maintenance requirements; cycle time to respond to unanticipated stockpile problems; degree to which DOE capacity for dismantlements meets U.S. policy requirements; variance from approved schedule for transferring facilities to EM; and compliance with environmental, safety and health requirements.

Weapons Program Direction

The Weapons Program Direction budget provides overall administrative support, including salaries and contractual support, to Federal employees at Defense Programs Headquarters and Operations Offices. The statutory Community Assistance Program at Los Alamos, New Mexico is also funded here. The Emergency Management program, managed by the Office of Nonproliferation and National Security, supports the Department's Emergency Management System and the Emergency Operations Center.

Materials Support

The Materials Support program is abolished in FY 1996 with responsibility for the Savannah River Site (SRS) facilities going to Environmental Restoration and Waste Management (EM), surveillance and safeguarding responsibilities of Special Nuclear Materials (SNM) at SRS, Fernald, Richland, Idaho, and Oak Ridge, along with some tritium activities, are moving to the Stockpile Management decision unit within the Weapons Activities Appropriation.

Nonproliferation and Verification Research and Development

The Nonproliferation and Verification Research and Development program supports the research, development, testing, and evaluation of systems needed for treaty verification, proliferation detection, warhead dismantlement, and intelligence activities. The program is divided into four major system areas: On-site systems, Regional Monitoring systems, Remote Sensing systems, and Advanced systems. Examples of performance measures in this category include: number of proliferation detection and arms control technologies under development; number of successful prototype demonstrations; contribution of DOE to the national capability for early detection of the proliferation of weapons of mass destruction; and improvement in ability to verify a comprehensive test ban treaty.

Arms Control

The Arms Control program supports negotiation and implementation of arms control and nonproliferation treaties, agreements and initiatives; including the Comprehensive Test Ban Treaty. The major areas of the program include: Analytical Support; Nuclear Nonproliferation Policy; Reduced Enrichment Research and Test Reactor (RERTR); International Safeguards; Export Control Operations; International Security; Treaties and Agreements; and Materials Protection, Control, and Accounting (accelerates cooperative lab-to-lab efforts with Russia concerning nuclear materials security, control, and accounting). Examples of performance measures in this category include: the number of facilities in which Russia establishes material control and accountability/physical protection (MC&A/PP) programs increases; the number of lab-to-lab cooperative programs established for MC&A/PP increases; the number of Nonproliferation Treaty adherents increases; and international traffic of highly enriched uranium/plutonium decreases.

Intelligence

The Intelligence program provides for increased proliferation intelligence of selected nuclear weapons states, and continues participation by the DOE in the Director of Central Intelligence's Nonproliferation Center. The program also provides for the continued development of the DOE counterintelligence program to deter and neutralize

foreign intelligence services' actions to acquire classified or sensitive DOE information; and continued threat assessments of DOE's facilities and operations including threats involving nuclear material. Examples of performance measures in this category include: contributions to National Intelligence Estimates; positive feedback from policy and program officials on quality and timeliness of specialized support; and increases in number of intelligence and law enforcement community participants in specialized training.

Nuclear Safeguards and Security

The Nuclear Safeguards and Security program is responsible for developing measures to assure adequate, cost-efficient, and effective protection of the Department's nuclear weapons, nuclear materials, facilities, and classified information against theft and sabotage, espionage and terrorist activity. The program supports technology development designed to provide state-of-the-art technology for our facilities. These developments will assist in providing cost effective long-term security. It also continues to emphasize a comprehensive review and revision of existing classification policies and the declassification of large volumes of classified documents, especially those documents concerning environmental, safety, and health issues. Examples of performance measures in this category include: improved protection and reduction in protective forces; gains in efficiency and reductions in DOE-wide costs without compromise to security; and increased volume and timeliness in previously classified information made available to the public.

Security Investigations

The Security Investigations program funds background investigations for DOE and contractor personnel who, in the performance of their official duties, require security clearances permitting access to Restricted Data, National Security Information, or Special Nuclear Material. Examples of performance measures in this category include progress toward goals of reducing the number of clearances in excess of those necessary to support DOE mission and the time taken to grant clearances.

Worker Training and Adjustment

In accordance with Section 3161 of the National Defense Authorization Act of 1993, the Worker and Community Transition program develops work force restructuring plans to assure that workers displaced because of curtailed defense mission responsibilities are provided assistance. The objective of these plans is to minimize the impacts on displaced workers by addressing: separation incentives; retraining; preference in hiring at other DOE facilities; and relocation assistance. In addition, the Department may provide impact assistance for community economic development initiatives. The plans have been developed in consultation with other National, State, and local government and non-government groups, including unions and community associations.

Fissile Materials Disposition

This program is responsible for the Department's technical and management activities to assess, plan and direct the implementation of efforts necessary to provide for the safe, secure, environmentally sound long-term storage of all weapons-usable fissile materials and the disposition of fissile materials declared surplus to National defense needs. Program efforts include completion of a Programmatic Environmental Impact Statement and technical and economic analyses regarding long-term storage and disposition of weapons-usable fissile materials, primarily plutonium and highly enriched uranium. The Program's technical and management efforts also include coordination with the United States Enrichment Corporation and U.S. industry to implement actions to disposition surplus weapons-usable highly enriched uranium by blending it down to low enriched uranium for use as commercial reactor fuel. This will result in reducing stockpiles of surplus fissile materials while also returning significant financial benefits to the U.S. Treasury.

The results of the environmental analysis in the Programmatic Environmental Impact Statement (PEIS) combined with information from technical and economic studies and National policy objectives will form the basis for a Record of Decision (ROD) expected in 1996 regarding which long-term storage and disposition options the Department recommends be employed. The decision to implement long-term storage and disposition options will involve numerous considerations including technical, economic, nonproliferation, environmental, international, and National policy and security considerations. A decision to commence implementation of surplus plutonium disposition will be made in a broad domestic and international context, involve other Executive branch agencies, and will ultimately reside with the President. The Department's technical efforts and analysis and its Record of Decision will provide the essential foundation to afford the President the flexibility to implement plutonium disposition options either multilaterally or bilaterally through negotiations or unilaterally as an example to other nations.

Naval Reactors

The Naval Nuclear Propulsion program, carried out jointly by the Departments of Energy and Navy, provides the Navy with safe, militarily-effective nuclear propulsion plants in keeping with the Nation's defense requirements, and ensures their continued safe and reliable operation. Its policies and practices have achieved a worldwide reputation for excellence and safety—U.S. nuclear-powered ships have steamed over 100 million miles without a single reactor accident or nuclear harm to crews, the public, or the environment. In FY 1996, Naval Reactors will continue to efficiently contribute to National Security by: supporting and improving over 130 operating reactors across nine different classes; developing and testing advanced nuclear reactor plant components/systems intended for the new attack submarine class, which is required by the Navy to maintain a viable submarine force and industrial base; and inactivating six or eight land-based prototype reactor plants.

Environmental Quality

The business line of Environmental Quality is primarily comprised of the defense and civilian Environmental Management programs and also supports funding of the Civilian Radioactive Waste Management program and independent Environment, Safety and Health missions.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Environmental Quality		
Environmental Management	\$6,496.0	\$6,591.7
Environment, Safety and Health	182.0	212.7
Civilian Radioactive Waste Management	522.9	199.1
Total, Environmental Quality	\$7,200.9	\$7,003.5

The Department's FY 1996 budget request for Environmental Management (EM) totals \$6,591.7 million. For FY 1996, the responsibilities of the EM program have substantially expanded to include many surplus Defense Programs (DP) facilities, materials, and received activities transferred to EM in conjunction with \$843 million from Defense Programs to support these new liabilities. The budget for EM is displayed in the following table:

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Environmental Management		
Corrective Activities	\$27.2	\$8.8
Waste Management	2,916.1	2,707.7
Environmental Restoration	1,768.5	1,993.7
Technology Development	417.4	390.5
Transportation Management	20.7	16.2
Nuclear Materials and Facilities Stabilization	1,687.6	1,679.7
Program Direction	84.9	—
Compliance and Program Coordinations	—	81.3
Analysis, Education and Risk Management	—	157.0
Uranium Enrichment D&D Fund	301.3	288.8
Subtotal, Environmental Management	7,223.7	7,323.7
Use of Prior Year Balances and Other Adjustments	-594.0	-300.0

Savannah River Pension Refund	—	-37.0
Transfer payment to UE D&D from Defense ER&WM	-133.7	-350.0
Foreign Payment	—	-45.0
Total, Environmental Management	<u>\$6,496.0</u>	<u>\$6,591.7</u>

Environmental Management

The principle Environmental Management mission is to reduce environmental risks at former nuclear weapons production and research facilities. When the Environmental Management program was established in 1989, it inherited a troubled legacy with significant environmental and political challenges. In addition to its environmental restoration mission (i.e., "cleanup") EM is responsible for additional activities such as plutonium stabilization, nuclear facilities management, waste management, and nuclear non-proliferation support. The title of the EM Office of Facility Transition and Management has been changed to Nuclear Materials and Facilities Stabilization to better reflect the expanding EM commitments in these areas. The 122 environmental management sites in 36 States have different functions, geographies, and degrees and types of contamination. The Office of Environmental Management is achieving it's six goals: 1) eliminate and manage the urgent risks in the system; 2) emphasize health and safety for workers and the public; 3) establish a system that is managerially and financially in control; 4) demonstrate tangible results; 5) focus technology development efforts on identifying and overcoming obstacles to progress; and 6) establish a stronger partnership between the Department of Energy and its stakeholders.

For nearly two years, the focus on these goals has resulted in aggressive productivity gains throughout the complex. The productivity improvements have been achieved without reductions in planned work scope at the sites. Through a combination of improved project management, reductions in excess, better cost estimating ability, reduced overhead/indirect costs and decreased support service contracting, the EM program will achieve \$613 million in Productivity Savings, \$433 million in Contractor Employment Reductions, and use \$300 million in prior year balances. These combined productivity gains will total nearly \$1.3 billion in budget savings in FY 1996.

Corrective Activities

Corrective Activities are necessary to bring active and standby facilities into compliance with applicable local, State, and Federal regulations. The major regulations governing these activities are the Clean Air Act, the Resource Conservation and Recovery Act, the Safe Drinking Water Act, and the Toxic Substances Control Act. This program is composed of corrective activities at facilities operated by the offices of Defense Programs, Nuclear Energy, Energy Research, and Environmental Management. After a facility is brought into compliance, funding responsibility for maintaining compliance falls to the base program responsible for

the facility. The highly successful results of this program are reflected in the declining budgets, from \$186.4 million in FY 1991 when over 175 individual corrective activities were originally identified, to \$8.8 million for FY 1996.

Waste Management

The largest portion, 37 percent, of the Department's Environmental Management budget supports waste management activities. These activities include the treatment, storage, and disposal of a variety of radioactive and hazardous chemical waste. Most of this work is directed to stored waste requiring safe disposition, however, a significant portion of this budget supports newly generated waste from ongoing operations and environmental restoration activities. The closure, decontamination and decommissioning of DOE facilities will continue to cause an increase in the volumes of low-level, mixed and transuranic waste to be treated and stored as these wastes are retrieved from contaminated facilities. Currently, Department of Energy facilities store more than 800,000 cubic meters of radioactive waste. In 1996 the Environmental Management program will continue to protect human health and the environment from the hazards of radioactive waste in a more cost-effective manner using greater managerial controls and improved program efficiencies. The Waste Management budget includes savings of \$612 million in FY 1996 through productivity savings, reductions in contractor personnel and the use of prior year uncosted balances.

The Department will continue to maintain the safe storage of 400,000 cubic meters of previously generated high-level waste and 100,000 cubic meters of transuranic waste. Approximately 50,000 cubic meters of low-level waste are disposed of annually. The Department has built treatment facilities for high-level waste in South Carolina and New York which are in the final phases of construction and undergoing test operations, and has planned for a treatment facility in Washington. These newly constructed facilities are expected to begin treating radioactive waste in FY 1996. In both 1995 and 1996, the primary emphasis of the Waste Management program will be to continue improving efficiency and eliminate risks and threats at Environmental Management sites, and demonstrate tangible results.

To eliminate urgent risks, EM will focus on stabilizing high-level waste storage tanks at Hanford, safeguarding over 30 million metric tons of plutonium, and management of all DOE spent nuclear fuel. In addition, the Department will avoid generating additional waste unless required for safety or mission needs. The changes in the recently renegotiated Hanford Tri-Party Agreement (TPA) among DOE, Washington State, and the EPA will be a major element of the FY 1996 program. The new strategy emphasizes acceleration of safety initiatives, tank waste characterization and upgrades, the system for low-level radioactive waste vitrification, and tank waste retrieval and pretreatment. These efforts will not only significantly reduce risks at Hanford, but will also reduce long-term costs of waste storage.

As part of the Waste Management program the Department is implementing an integrated Spent Fuel Management Program. The program will address a variety of

safety problems with stored spent nuclear fuel such as corroding fuel elements, failed storage hangers and racks, and inadequate water basins, which are used to store most of the 2,700 metric tons of spent nuclear fuel now held by the Department. The management of spent nuclear fuel under one coherent program is designed to ensure safe and efficient consolidation, storage, and preparation for final disposal in a geologic repository.

The Waste Management component of Environmental Management program is developing an aggressive pollution prevention program. This includes coordinating information and providing guidance to other Department offices responsible for ensuring that waste minimization goals are established and implemented at their sites. Waste minimization programs and activities were initiated at many sites in 1991 and, in 1994, the Department issued the more comprehensive Waste Minimization Crosscut Plan. The Department invested \$17 million in 1994 to reduce the total amount of waste generated, reducing the amount that must be treated and disposed of or stored. This investment yielded several times this amount in avoided costs. If the sites meet Secretary O'Leary's goal to reduce by 50 percent the amount of waste the Department's facilities routinely produce by 1999, millions of dollars can be saved and significant risks can be avoided.

Some accomplishments the Waste Management program expects to make in FY 1996 include: the processing of high-level waste into a safer glass form at the Defense Waste Processing Facility in South Carolina and at the West Valley Demonstration Project in New York; completion of the regulatory compliance package for submittal to the Environmental Protection Agency for the Waste Isolation Pilot Plant in New Mexico; operation of the Toxic Substances Control Act incinerator at Oak Ridge in Tennessee; further improvements in the safety of tank waste storage and the building of new spent fuel storage at Hanford; further improvements in the spent fuel storage at Idaho; implementation of site waste treatment plans as negotiated through the Federal Facility Compliance Act process; provision of waste management services to Department of Energy programs and promotion of waste minimization efforts in all Departmental operations. The Waste Management program will also provide the primary support for vital U.S. nuclear non-proliferation objectives such as the Reduced Enrichment Research and Test Reactor program including the proposed return of Foreign Research Reactor Spent Fuel by mid-year.

Environmental Restoration

The Environmental Restoration program's mission — generally referred to as "cleanup" — involves protecting human health and the environment by stabilizing radioactive waste; remediating contaminated soil, groundwater and surface water; decontaminating and dismantling contaminated facilities; and conducting assessments and characterization of DOE sites to determine the potential for radioactive and hazardous waste releases.

Before actual cleanup work can begin, adequate site assessments must be conducted to determine the extent of contamination and risk involved. However, in FY 1996 the Department is continuing to shift funding from study toward increased on-the-ground remediation activity. Environmental Restoration's FY 1996 budget request also includes savings of more than \$400 million through productivity improvements, contractor reductions, and use of prior year balances.

The major Environmental Restoration program activities are: (1) safe management and remediation of contaminated sites, which includes characterization, remedial action, decontamination and decommissioning, and closure activities at over 30 major DOE installations throughout the United States; (2) the Formerly Utilized Sites Remedial Action Project, which includes remediation of 44 sites (39 former Manhattan Engineer District or Atomic Energy Commission sites and five sites added by Congress); (3) the Uranium Mill Tailings Remedial Action Project for remediation of 24 inactive uranium mill tailings sites (sites that provided uranium for past Manhattan Engineer District and Atomic Energy Commission activities) and more than 5,000 associated vicinity properties; (4) the Uranium Mill Tailings Groundwater Restoration Project to restore, as necessary, the groundwater at the 24 Uranium Mill Tailings Remedial Action Project processing sites to ensure compliance with EPA standards; and (5) the Uranium Enrichment Decontamination & Decommissioning (D&D) Fund, which provides for D&D, remedial actions, site-wide landlord requirements, and surveillance and maintenance efforts at the uranium enrichment facilities at Portsmouth, Ohio and Paducah, Kentucky and the K-25 site in Tennessee.

The Environmental Restoration program has grouped its activities into three major areas against which performance will be measured. These major areas are: (1) remedial actions; (2) decontamination and decommissioning efforts; and (3) general crosscutting program support activities.

Remedial action requirements are derived principally from the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and the Resource Conservation and Recovery Act of 1976 (RCRA), as amended. Activities include remediation of inactive waste disposal sites, uncontrolled release sites, and underground storage tanks. The scopes, schedules, and standards for these activities are negotiated with the EPA and the affected States.

Decontamination and decommissioning activities continue at reactors, hot cells, production facilities, laboratories, processing plants, storage tanks, and other structures that have been contaminated from past Department activities. Performing additional decontaminating and decommissioning in FY 1996 will reduce the need for future surveillance and maintenance, which will ultimately lower potential adverse worker health and safety incidences, lower costs, and contribute to the overall DOE site cleanup required by numerous compliance agreements.

The general crosscutting program support activities cover a wide variety of environmental restoration initiatives such as cost estimating procedures, systems integration, risk-based assessments, and productivity improvement efforts. This area also includes Federal staffing expenses at Headquarters and the various Field Office elements, landlord support activities at several DOE sites, and compliance oversight expenses for State and external organizations where remediation efforts are being conducted.

Technology Development

The Environmental Management Technology Development program is an aggressive National program of applied research, development, demonstration, testing, and evaluation for environmental cleanup, waste management, and related technologies. The Technology Development program is designed to meet the EM goal of focusing efforts on identifying and overcoming obstacles to progress. This goal will be achieved by resolving major technical issues, rapidly advancing beyond current technologies for environmental restoration and waste management operations, thereby expediting compliance with applicable environmental laws and regulations. The underlying strategy is to identify and develop high-payoff environmental restoration and waste management technologies that can: (1) clean up the inventory of DOE nuclear component manufacturing sites; and (2) manage DOE-generated waste faster, better, safer and cheaper than is possible with current environmental cleanup technologies. In many cases, the development of a new technology presents the best hope for ensuring a substantive reduction in risk to the environment and improved worker/public safety within realistic financial constraints.

Technology Development has adopted three performance indicators to demonstrate the effectiveness of the program: the number of technologies demonstrated; the level of private industry involvement; and the number of technologies implemented.

Technology Development will also focus on the EM goal of establishing a stronger partnership between DOE and its stakeholders. This effort will include strengthening relationships with stakeholders to provide technology systems that meet regulatory and institutional requirements. Factors being addressed include industry involvement, technical progress, commercial progress, technology transfer process effectiveness, and overall investment effectiveness. Continuing active partnerships with U.S. industry, the National Laboratories, other Federal agencies, universities, and appropriate international participants to provide technologies to DOE and transfer technology systems to industry will be included within the FY 1996 activities.

Transportation Management

The Transportation Management Division develops and maintains the DOE's baseline transportation resources, including effective strategies, techniques, methods, policy, and guidance for safe, efficient, and cost-effective materials transportation.

The program includes: (1) transportation of all DOE materials including hazardous and radioactive materials and wastes to and from DOE facilities (except weapons, weapons components, and commercial irradiated nuclear fuel); (2) packaging and shipping activities; and (3) development of systems and technologies (i.e., packaging development, automation initiatives and training and development programs) to ensure that safe, economical, and efficient transportation services that meet regulatory requirements are consistently available. The FY 1996 budget request for transportation includes savings of approximately \$3 million through contractor reductions and use of prior year balances.

Nuclear Materials and Facilities Stabilization

The new name for the former Office of Facility Transition and Management is the Office of Nuclear Materials and Facilities Stabilization. The Office of Nuclear Materials and Facilities Stabilization within EM coordinates and oversees the orderly transition of contaminated installations/facilities from other programs to EM after they are determined to be surplus to the other programs' mission. Contaminated surplus facilities are being transferred to EM to be maintained in a safe, cost-effective, and environmentally-sound status until they can be cleaned up for reuse or prepared for final decontamination and dismantlement. The Office of Nuclear Materials and Facilities Stabilization program addresses the technical, socioeconomic, institutional, and administrative issues involved in transferring, cleaning up, closing, and deciding the final role of a facility.

Some of the highest priorities for the entire EM program are carried out by the Office of Nuclear materials and Facilities Stabilization. They include safe handling and stabilization of several metric tons of weapons usable plutonium in the form of scraps and residues. This work not only requires extraordinary technical operation of large processing and storage facilities, but vital nuclear safeguards and cooperation with international nonproliferation regimes. Moreover, investments in stabilizing materials and Facilities will yield substantial out year budget savings in reduced maintenance and oversight costs.

The FY 1996 budget includes a target funding transfer to EM for new site management responsibilities at the Savannah River Site (SRS), the Mound and Pinellas Plants, as well as a large number of high risk facilities at other sites. Although EM will not assume full landlord and budgeting responsibility for SRS until FY 1996, it will assume many comprehensive management functions at SRS during FY 1995. This includes management of five surplus and shutdown nuclear reactors and two large reprocessing canyon facilities. In addition, Nuclear Materials and Facilities Stabilization will accept Idaho's Power Burst Reactor and Advanced Reactivity Measurement Facility/Coupled Fast Reactivity Measurement Facility Reactors, Albuquerque's Special Nuclear Material Laboratory Filter House, Richland's Building 309, as well as several facilities among Oak Ridge and Oakland operations office facilities.

The Office of Nuclear Materials and Facilities Stabilization also will continue to conduct landlord activities at Rocky Flats, Idaho, and Richland. These activities consist of maintenance of the site infrastructure and include management of construction projects, procurement of general purpose capital equipment, site development planning activities, and Capital Assets Management Process activities. Other activities include managing real estate; road, ground, and vehicle maintenance; general purpose facility and equipment maintenance; utilities; transportation; telecommunications; safeguards and security; environmental monitoring; sanitary waste treatment and disposal; and emergency services.

In addition, Nuclear Materials and Facilities Stabilization will continue to play a significant role in developing the policy and procedures for acceptance and disposition of surplus facilities, including risk assessments that determine the priority of facility transfers. This office is also working with the Office of Technology Development to develop needed technology for its unique mission.

Nuclear Material and Facilities Stabilization is aggressively working to implement productivity and efficiency improvements within its activities. In FY 1996, the program will realize nearly \$300 million in productivity and efficiency savings through better project management, reduced contractor employment, and the use of prior year balances. During FY 1996, the Office of Nuclear Materials and Facilities Stabilization will use performance indicators to measure the progress of the program. These indicators include the reduction of technical noncompliance and safety violations, reduction in surveillance and maintenance costs, increase in the number of deactivation completions, and surveys of the facilities and stakeholders.

Compliance and Program Coordination provides independent monitoring and appraisal, integrated and independent performance analysis, and technical assistance for Environmental Management activities in the areas of environment, safety and health; engineering and cost evaluations, emergency management, analytical services, quality assurance, and self-evaluation. Also, included are program direction expenses associated with headquarters and operations/field office Federal management of Compliance and Program Coordination and Transportation Management program activities. In FY 1996, this program will focus on providing a safe workplace by completing safety and health plans and Safety Analysis Reports or Preliminary Hazards Analysis at all major facilities, and developing standards/requirement identification documents for all major Environmental Management facilities.

Analysis, Education, and Risk Management (formerly entitled Program Direction) provides Federal Staffing resources and associated funding to plan, direct, and manage the Environmental Management program and provides for crosscutting activities, such as educational development, which supports the overall Environmental Management mission. Funding for the Office of Integrated Risk Management and the Office of Public Accountability is also included.

The Uranium Enrichment Decontamination and Decommissioning (D&D) Fund established by the Energy Policy Act of 1992, supports D&D, remedial actions, waste management, K-25 landlórd requirements, and surveillance and maintenance activities associated with pre-existing conditions at the three gaseous diffusion plants owned by the Department of Energy and located at Paducah, Kentucky; Portsmouth, Ohio; and Oak Ridge, Tennessee.

Environment, Safety and Health

Independent internal environment, safety, and health oversight activities include routine monitoring and management oversight to ensure that facilities are operated consistent with Departmental orders and applicable external regulatory requirements. This category includes principally the oversight functions of the Office of Environment, Safety, and Health. It also includes the Office of Nuclear Safety, which provides independent oversight of DOE nuclear safety activities through the continuous assessment of DOE and contractor nuclear safety standards and performance, and the Nuclear Safety Policy activities managed by the Office of Environment, Safety, and Health.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Environment, Safety and Health		
Environmental Research and Development	\$126.7	\$149.6
Office of Nuclear Safety	21.7	24.7
Nuclear Safety Policy	17.2	17.2
Security Evaluations	15.5	14.7
Marshall Island/Dose Reconstruction	7.0	9.7
Defense Nuclear Facilities Safety Board Representative .	0.5	1.0
Subtotal, Environment, Safety and Health	188.6	216.9
Use of Prior Year Balances and Other Adjustments	-6.6	-4.2
Total, Environment, Safety and Health	\$182.0	\$212.7

Environmental Research and Development

The Office of Environment, Safety and Health (EH) is responsible for oversight of all DOE activities to determine whether they are being conducted in conformance with applicable environmental laws and regulations and in a manner designed to ensure that the health and safety of workers and the public are protected. The Office also ensures that National environmental protection goals are incorporated in all DOE program areas; ensures that environmental, health and safety concerns are identified, prioritized and

addressed through corrective and remedial action; and provides liaison with other Federal agencies, such as the Environmental Protection Agency, the Department of Labor, and the Department of Health and Human Services, concerning regulatory efforts and specific actions of those agencies that may have an effect on the Department's operations. The Office of Environment, Safety and Health has proposed a reorganization that will provide for value-added oversight, clear, risk-based guidance and standards tied to specific performance measures, technical assistance, leadership in addressing Department-wide problems, facilitating solutions, and open, proactive communications.

Office of Nuclear Safety

The Nuclear Safety programs provide independent oversight of nuclear safety to assure the Secretary of Energy and, in turn, the Congress and the public, that the Department of Energy workers, the public, and the environment are receiving the highest level of health and safety protection reasonably achievable from Departmental nuclear operations. The program has broad authority under its charter to monitor and audit all aspects of nuclear safety through inspections, assessments, and investigations to identify circumstances indicative of deteriorating or inadequate nuclear safety performance. The program is also responsible for the Department's enforcement policy associated with the civil and criminal penalty authority of the Price-Anderson Amendments Act of 1988, Public Law 100-408. Some performance measures include a decrease in radiological exposures, releases, occupational illness or injury and environmental impacts, and the timely identification of lessons learned and tracking of adverse trends to avoid future incidents.

Nuclear Safety Policy

The Nuclear Safety Policy program develops and maintains nuclear safety requirements through directives (rules, orders, guidance and standards) for design, construction, operation, decommissioning and decontamination of the Department's nuclear (reactor and non-reactor) facilities, and supports implementation of the directives. The program develops performance-based training instruction material for the Department's contractor operating staff, and develops and maintains an occurrence reporting system and has developed a performance indicator trending program to assist the Department and contractor line management in analyzing the input data for senior Department management.

Security Evaluations

This program provides for independent oversight of the effectiveness of DOE safeguards and security policies and programs. This is accomplished by conducting inspections and assessments of safeguards and security policies, programs, and their implementation. Assessments of the effectiveness of protection policies and programs are conducted to provide a consolidated statement of the status of protection programs over the entire DOE complex. This program also budgets for the Radioactive Materials Packaging

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Civilian Radioactive Waste Management		
Civilian Radioactive Waste Management Activities:		
Nuclear Waste Fund Appropriation	\$392.8	—
Defense Nuclear Waste Disposal Appropriation	129.4	\$198.4
Mandatory Funding (from Nuclear Waste)(non-add)	—	(413.6)
Total, Civilian Radioactive Waste Management Activities	522.2	198.4
Civilian Radioactive Waste Research and Development .	0.7	0.7
Total, Civilian Radioactive Waste Management	\$522.9	\$199.1

Civilian Radioactive Waste Management Activities

The increased funding levels have provided the Department with a basis to redirect the Civilian Radioactive Waste Management Program. Key components of the new program approach include: a focus on early site suitability evaluation of the Yucca Mountain site by realigning site characterization activities and supporting those with increased funding and staff; addressing the realities of near-term management of spent nuclear fuel by resolving the waste acceptance issue and defining the Department's role for near-term storage; and developing a Multi-Purpose Canister (MPC) system that is integrated into all program elements. The new program approach would result in the following key milestones for the Yucca Mountain Site Characterization Project: technical site suitability determination in 1998; if the site is found suitable, submittal of a repository license application to the NRC in 2001; and the start of repository operations in 2010. The major milestone for the spent fuel storage initiative is the availability of MPC's in 1998.

To support the Program's out-year funding requirements, a multi-year Program Plan has been prepared to accompany the budget request. The Program Plan describes future activities and funding levels for the major elements of the Program, and includes criteria or indicators against which Program performance can be measured.

The FY 1996 request provides \$472.1 million to continue characterization of the Yucca Mountain candidate repository site. Major activities include underground excavation and tunneling related to construction of the Exploratory Studies Facility (ESF), as well as underground testing in the ESF. The ongoing surface-based testing program is also supported. Testing and design programs will focus on activities that are necessary to support DOE decisions on site suitability, site recommendation and submittal of the license application. Output measures for FY 1996 include: issuance of the Preclosure Rock Characteristics Higher Level Finding, excavation of the ESF north ramp and two exploratory drifts in the Ghost Dance Fault, seismic design input to the repository

Certification program, which certifies that radioactive material packages are in compliance with Federal safety regulations.

Examples of performance measures in this category include: provide information for cost-effective decision making by operations office manager; promote continuous improvement in the Department's performance through value-added and cost-recovery impact on field performance in meeting Department goals; and provide proactive initiatives and organizational preparation for the future.

Civilian Radioactive Waste Management

The mission of the Office of Civilian Radioactive Waste Management (OCRWM) is to manage and dispose of the Nation's spent nuclear fuel and high-level radioactive waste. The Office provides leadership in developing and implementing strategies that assure public and worker health and safety, protect the environment, merit public confidence, and are economically viable. The Office was established by the Nuclear Waste Policy Act (NWPA) of 1982 to dispose of spent nuclear fuel and high-level nuclear waste from commercial and atomic energy defense activities in a permanent geologic repository. The Nuclear Waste Policy Amendments Act (NWPAA) of 1987 designated only the Yucca Mountain, Nevada, site for detailed scientific investigation activities in order to evaluate the site's suitability for hosting a permanent geologic repository. The NWPAA also authorized the siting, construction, and operation of a Monitored Retrievable Storage (MRS) facility, subject to certain conditions.

The Civilian Radioactive Waste Management Program is currently funded through three sources: the Nuclear Waste Fund, the Defense Nuclear Waste Disposal appropriation, and an appropriation for the Civilian Radioactive Waste Research and Development Program. For FY 1996, a legislative proposal will be submitted to Congress which authorizes mandatory (not subject to annual appropriations) funding for the Program from the Nuclear Waste Fund. This proposal would provide increased funding for the Program and establish the requisite out-year funding profile. The total FY 1996 funding for the Program is \$630.0 million, which includes \$198.4 million from the Defense Nuclear Waste Disposal appropriation and \$431.6 million of mandatory funding from the Nuclear Waste Fund. In addition, \$0.7 million is requested for the Civilian Radioactive Waste Research and Development program from the Energy Supply R&D appropriation.

Advanced Conceptual Design, and the completion of Revision 1 of the License Application Annotated Outline.

The FY 1996 budget request for spent fuel storage-related activities is \$27.4 million. The major effort is the development of a Multi-purpose Canister (MPC) system. The MPC will meet the requirements for storage, transportation and, eventually, disposal using overpacks suitable for each function. Based on the FY 1996 funding profile, MPCs will be available for storage of spent nuclear fuel (up to 400 metric tons of uranium) in 1998. The budget assumes the decision to proceed into the NRC certification phase for MPCs will be made in FY 1996. Output measures include: completion of the MPC designs for large and small MPCs and submittal of Safety Analysis Reports (SARs) to the NRC for storage and transportation, and initiation of fabrication of full-size MPC prototype. Contingency funding of \$47.1 million and \$107.5 million is included in FY 1998 and FY 1999, respectively, for interim storage activities, which assumes passage of a legislative proposal.

The request of \$7.6 million for Waste Acceptance includes activities to complete, issue and implement the Final Rule modifying the Standard Disposal Contracts between DOE and the utilities to address an MPC-based civilian radioactive waste management system, initiate the spent fuel verification process, and manage the Standard Disposal Contract. The request also provides \$14.5 million to maintain the Quality Assurance program, \$13.0 million for systems integration and regulatory compliance activities, and \$68.8 million for Program Management, which includes: Federal salaries, benefits, and travel; strategic planning; international program support; external relations; program control and administration; and information management.

Mandatory Funding

For FY 1996, legislation will be proposed to provide increased funding for the Department of Energy's Civilian Radioactive Waste Management Program. Funding would continue to be requested from the Defense Nuclear Waste Disposal appropriation with additional funding for the Program provided from the Nuclear Waste Fund on a permanent basis, subject only to any specific directives or limitations included in appropriation Acts. These additional resources would be used to accelerate scientific and engineering activities at the Yucca Mountain site in Nevada.

The spending associated with this proposal would be offset for budgetary scorekeeping purposes by the additional receipts associated with the sale of the U. S. Enrichment Corporation and the extension of the Superfund corporate environmental income tax. Both the receipts associated with the sale of the Corporation and the extension of the Superfund tax are being used to meet the Pay-As-You-Go requirements of the Budget Enforcement Act. The Superfund receipts would continue to be dedicated to the Hazardous Substance Trust Fund to be only used for Superfund cleanups.

Civilian Radioactive Waste Research and Development

The FY 1996 request of \$0.7 million continues the monitoring of casks at the Idaho National Engineering Laboratory containing fuel from dry storage demonstration projects and research and development on long-term spent fuel storage. The Office of Civilian Radioactive Waste Management continues its participation in a DOE/industry/utility research, development, and demonstration project to develop a dry spent fuel transfer system and a transport/storage system.

Management and Other Activities

The DOE missions identified in the Policy Overview do not account for all of the Department's funding request. Other Departmental functions include energy information, regulation, and management and administration.

Management and Other Activities	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Energy Information Administration	\$84.6	\$84.7
Administering Energy Laws and Regulations	12.4	10.5
Departmental Management	308.1	348.1
Undistributed Use of Prior Year Balances, Energy Supply	—	-52.0
Total, Management and Other Activities	\$405.1	\$391.3

Energy Information Administration

The FY 1996 budget request (\$84.7 million) enables Energy Information Administration to maintain its basic programs and continue work on the requirements of the Energy Policy Act of 1992 (EPACT), accommodating inflationary and pay increases through efficiency improvements. Savings are realized in all programmatic areas through continued re-engineering of data collection, processing, and publication processes and streamlining of documentation requirements. Statistics are collected in various energy resource areas, such as oil and gas, coal, nuclear, electric and alternative fuels. Also, energy markets are analyzed and the National Energy Modeling System generates mid-term forecasts to integrate energy supply and demand.

Administering Energy Laws and Regulations

The Department includes a number of organizations which administer energy laws and regulations. The Regulatory Litigation section of the Office of General Counsel and the Office of Hearings and Appeals are involved in completing the disposition of cases dating from the period of petroleum price controls.

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Administering Energy Laws and Regulations		
Office of the General Counsel, Regulatory Litigation Section	\$5.7	\$3.7
Office of Hearings and Appeals	6.7	6.8
Federal Energy Regulatory Commission		
Federal Energy Regulatory Commission (gross)	166.2	151.6
Payments to States (non-add)	(2.5)	(2.5)
Use of prior year balances	—	-15.0
Less: Offsetting Collections	-166.2	-136.6
Total, Federal Energy Regulatory Commission	—	—
Total, Administering Energy Laws and Regulations	\$12.4	\$10.5

Office of the General Counsel- Regulatory Litigation Section

The FY 1996 budget request of \$3.7 million provides for litigation or settlement of approximately 15-20 remaining cases involving approximately \$2.3 billion of refund claims for alleged pricing violations of the Emergency Petroleum Allocation Act of 1973, Public Law No. 93-159. In addition to funding the FTE's, this budget also provides funding to Human Resources and Administration for administrative support, and a litigation support service contract.

Office of Hearings and Appeals

The FY 1996 budget request of \$6.8 million provides funding to process and resolve applications for refunds from oil overcharge funds paid to the Department in settlement of actual or alleged violations of expired mandatory petroleum allocation and pricing regulations. The office provides funding to Human Resources and Administration for administrative support. Excess monies from refund processing are transferred to the Treasury Department for deficit reduction and to the States to fund energy conservation programs.

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission is responsible for overseeing the operations of key parts of America's energy industries: natural gas and oil pipelines, electric utilities, and hydropower facilities. The Commission seeks to ensure that consumers receive adequate, reliable supplies of energy at the lowest possible price, and to provide energy suppliers and transporters a just and reasonable return on capital investment and

the opportunity to adjust to rapidly changing market conditions. In FY 1996, the Commission will continue to protect the public by encouraging competitive markets where appropriate, while maintaining more traditional forms of regulation where competitive markets do not exist or market forces do not work to protect the public interest, through further implementation of the Energy Policy Act of 1992, and reducing barriers to competition and generation in the electric power industry. The Commission also will maintain its focus and efforts on environmental issues and compliance in all program areas, and make regulation work better through improved automation and efficiency. The Commission has determined its total funding requirement to be \$151.6 million for FY 1996, of which \$15 million will be derived from prior-year unobligated balances, thereby reducing the request for new budget authority to \$136.6 million.

Departmental Management

This category includes general management and support activities benefiting all elements of the Department of Energy, including the four DOE Operations Offices (Chicago, Oakland, Idaho and Oak Ridge) which are not primarily funded by the Department's Defense or Environmental Management offices. Included in this category are a wide array of policy development and analysis activities, institutional and public liaison functions, and other program support requirements necessary to ensure effective Departmental operation and management. The FY 1996 budget request for Departmental Management activities is distributed in the following manner:

	Budget Authority (in millions)	
	FY 1995 Approp.	FY 1996 Request
Departmental Management		
Headquarters Support	\$298.8	\$311.0
Operations Office Support	114.8	117.1
Cost of Work for Others	24.4	22.8
Subtotal, Departmental Administration (gross)	438.0	450.9
Revenues	-125.7	-122.3
Total, Departmental Administration (net)	312.3	328.6
Inspector General	32.4	32.9
Subtotal, Departmental Management	344.7	361.5
Use of Prior Year Balances	-36.6	-13.4
Total, Departmental Management	\$308.1	\$348.1

Headquarters Support

The budget request provides a staffing level of 1,924 to support Headquarters staff. DOE programs funded in this appropriation are: Office of the Secretary, Policy, Chief Financial Officer, Human Resources and Administration, Congressional and Intergovernmental Affairs, Public and Consumer Affairs, General Counsel, Economic Impact and Diversity, Board of Contract Appeals, and Field Management. Federal support functions include planning and National and international energy policy analysis, environmental policy, budget, accounting, legal, personnel, labor relations, staffing, organizational management, logistical services, printing, automated data processing development and acquisition, contract management and reform, quality management, personal property management, scientific and technical training, congressional liaison, public and consumer outreach, economic impact and diversity, contract dispute adjudication, and field oversight (infrastructure, project and facilities management, and contract employee protection). Funding includes Departmental Administration employee travel and training, and contractual services such as support to overseas offices, budget and accounting systems, contract audit, rental of buildings, telecommunications, postage, printing and reproduction, building operations, logistical services, automated data processing development and acquisition (non program specific), furniture, equipment maintenance, civil rights and contractor employee investigations, independent cost estimates, project control system development, public utilities negotiations, and capital equipment. Also funds energy and environmental policy studies, public service announcements, newswire services, minority education/business/community support and assistance, and DOE technical training development. The budget reflects funding to support: headquarters staff (\$148.1 million), contractual support (\$137.4 million), capital equipment (\$5.9 million), and program support (\$19.7 million).

Operations Office Support

The budget request provides a staffing level of 1,143 to support 2,165 Federal employees and perform oversight of activities performed by the 56,800 management and operating contractor employees at Chicago, Idaho, Oak Ridge, and Oakland. Federal support functions include budget, accounting, legal, patent, personnel, labor relations, staffing, organizational management, freedom of information, telecommunications, space management, logistical services, printing, automated data processing development and acquisition, building operations, procurement acquisition, contract management and reform, quality management, personal property management, and environmental health and safety assessment. Funding includes Departmental Administration employee travel and training, and contractual services such as rental of buildings which house Departmental Administration employees, telecommunications, postage, printing and reproduction, building operations, logistical services, automated data processing development and acquisition (non program specific), furniture, equipment maintenance, support service contracts, and capital equipment for all Federal employees. The budget

reflects funding to support: field office staff (\$76.8 million), contractual support (\$39.1 million), and capital equipment (\$1.2 million).

Cost of Work for Others

The budget request (\$22.8M) provides for the cost of products and services provided by the field offices and National laboratories for non-DOE users. Work results from a budgeted mission of DOE or is reimbursable work for non-Federal entities where advance funding cannot be provided. Costs are offset with revenues received from the sale of products or services. Examples of activities are: forest management and timber sales, specialized computer and automation support, utilities sales (water), seismic monitoring techniques, operation of the Superconductivity Information System and the National Energy Software center, particle physics collaboration and a wide range of activities for State and local governments.

Revenues

The revenue estimates associated with the Cost of Work for Others program (-\$25.8M) support the products and services described above. Miscellaneous revenues (\$-96.5M) come from the sale of by-products that have no cost associated with the Departmental Administration appropriation, but offset the appropriation. Examples are: lease of LANL facilities (gas and electric) to a utility company, lease of ORO facilities (Gaseous Diffusion Plant) by the U.S. Enrichment Corporation, handling and basin storage of spent fuel cores from Navy ships, residual material (uranium) in the spent fuel cores, and added factor and depreciation from the DOE Reimbursable Work for Others program.

Inspector General

The Office of Inspector General's FY 1996 budget request provides support for 356 FTEs to support audits, inspections, and investigations to promote the effective, efficient, and economical operation of DOE programs; to ensure compliance with laws and regulations; and to guard against possible waste, fraud and mismanagement.

The budget also provides for support services such as contract auditors for audit of financial statements, technical specialists, ADP support and employee training. The Office of Inspector General will complete an estimated 200 audits in FY 1995, and 200 in FY 1996; 235 investigations in FY 1995, and 235 in FY 1996; and 460 inspection matters in FY 1995, and 460 in FY 1996.

Appendix

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Energy and
 Water Development Appropriations

Energy Supply Research and Development

	<u>FY 1995</u>	<u>FY 1996</u>
	<u>Approp.</u>	<u>Request</u>
Solar and Renewable Energy		
Solar Energy		
Solar Buildings Technology Research	\$4,610	\$4,657
Photovoltaic Energy Systems	87,527	88,129
Solar Thermal Energy Systems	31,458	33,943
Biofuels Energy Systems	59,643	80,380
Wind Energy Systems	47,139	49,820
International Solar Energy Program	9,087	29,154
Solar Technology Transfer	22,406	17,758
National Renewable Energy Laboratory	5,963	6,000
Resource Assessment	3,950	4,665
Solar Program Support	12,199	7,345
Program Direction - Other Solar Energy	8,200	9,460
Review of Uncosted Balances	—	-4,888
Total, Solar Energy	292,182	326,423
Geothermal	37,807	36,972
Hydrogen Research	9,616	7,334
Hydropower	4,846	980
Electric Energy Systems and Storage	44,376	46,942
Policy and Management - CE	4,817	4,746
Total, Solar and Renewable Energy	393,644	423,397
Nuclear Energy		
Nuclear R&D Activities		
Light Water Reactor	64,329	49,740
Advanced Reactor R&D	19,948	—
Space Reactor Power Systems	1,224	—
Advanced Radioisotope Power System	59,894	49,237
Facilities	7,027	—
Nuclear Technology R&DR	—	37,300
Program Direction	12,500	13,000
Policy and Management - NE	11,900	10,200
Test Reactor Area Hot Cells	1,430	1,400
Oak Ridge Landlord	14,252	18,685
Test Reactor Area Landlord	3,959	4,000

Energy Supply Research and Development (Continued)

	FY 1994 Approp.	FY 1995 Request
Advanced Test Reactor Fusion Irradiation	2,683	2,303
University Nuclear Science & Reactor Support	3,584	6,130
Total, Nuclear Energy R&D	202,730	191,995
Termination Costs	69,705	81,700
Isotope Support	19,493	25,358
Soviet Designed Reactor Safety	—	78,764
Russian Replacement Power Initiative	—	5,000
Total, Nuclear Energy	291,928	382,817
Civilian Waste Research and Development	692	699
Environment, Safety and Health		
Environmental Research and Development	126,740	149,579
Nuclear Safety Policy	17,180	17,180
Total, Environment, Safety and Health	143,920	166,759
Energy Research		
Biological and Environmental Research	436,641	431,664
Fusion Energy	368,421	366,045
Basic Energy Science	733,940	811,419
Advanced Neutron Source	20,764	—
Energy Research Analyses	3,407	3,463
Laboratory Technology Transfer	56,900	58,776
Advisory and Oversight	12,450	9,780
Multi-Program Energy Laboratories	43,034	51,016
Policy and Management - ER	2,200	2,200
Total, Energy Research	1,677,757	1,734,363
Other Energy Programs		
University & Science Education Programs	65,988	55,418
Technical Information Management Program	16,124	17,450
Technology Partnership	—	3,153
In-House Energy Management	30,729	28,789
Total, Other Energy Programs	112,841	104,810
Environmental Restoration & Waste Management		
Corrective Activities	26,700	5,404
Environmental Restoration	388,597	417,758
Waste Management	243,016	206,145
Nuclear Materials and Facility Stabilization	73,336	83,683
Total, Environmental Restoration & Waste Mgmt	731,649	712,990
Subtotal, Energy Supply Research & Development	3,352,431	3,525,835
Prior Year Balances & Other Adjustments	-37,883	-129,300
Total, Energy Supply Research & Development	<u>\$3,314,548</u>	<u>\$3,396,535</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Energy and
 Water Development Appropriations

Uranium Supply and Enrichment Activities

	FY 1995 Approp.	FY 1996 Request
Uranium Enrichment Activities	\$89,345	\$102,898
Revenues	—	-34,903
Use of Prior Year Balances	-16,135	-25,703
Total, Uranium Supply and Enrichment Activities	<u>\$73,210</u>	<u>\$42,292</u>

**Uranium Enrichment Decontamination and
Decommissioning Fund**

Decontamination and decommissioning fund	<u>\$301,327</u>	<u>\$288,807</u>
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General Science and Research

High Energy Physics	\$642,129	\$685,552
Nuclear Physics	331,502	321,078
General Science Program Direction	10,400	10,900
Total, General Science and Research	<u>\$984,031</u>	<u>\$1,017,530</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Energy and
 Water Development Appropriations

Weapons Activities

	FY 1995 Approp.	FY 1996 Request
Stockpile Stewardship	\$1,464,040	\$1,606,580
Stockpile Management	1,759,574	1,906,883
Program Direction	159,852	138,056
Subtotal, Weapons Activities	3,383,466	3,651,519
Use of Prior Year Balances	-143,276	-111,344
Total, Weapons Activities	<u>\$3,240,190</u>	<u>\$3,540,175</u>

Defense Environmental Restoration and Waste Management

Corrective Activities	\$512	\$3,406
Environmental Restoration	1,379,924	1,575,973
Waste Management	2,673,047	2,501,596
Technology Development	417,359	390,510
Transportation Management	20,684	16,158
Program Direction	84,948	—
Nuclear Materials and Facility Stabilization	1,614,275	1,596,028
Compliance and Program Coordination	—	81,251
Analysis, Education, and Risk Management	—	157,022
Subtotal, Defense Environment Restoration and Waste Mgmt.	6,190,749	6,321,944
Use of Prior Year Balances	-585,823	-313,942
Total, Defense Environment Restoration and Waste Mgmt.	<u>\$5,604,926</u>	<u>\$6,008,002</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Energy and
 Water Development Appropriations

Materials Support and Other Defense Programs

	FY 1995 <u>Approp.</u>	FY 1996 <u>Request</u>
Other National Security Programs		
Verification and Control Technology	\$345,897	\$430,842
Nuclear Safeguards and Security	88,816	89,516
Security Investigations	33,399	33,247
Security Evaluation	15,460	14,707
Nuclear Safety	21,679	24,679
Worker and Community Transition	115,000	100,000
Fissil Materials Control and Disposition	50,000	70,000
Total, Other National Security Programs	670,251	762,991
Naval Reactors	723,613	682,168
Subtotal, Materials Support & Other Defense Prog.	1,393,864	1,445,159
Use of Prior Year Balances and Other Adjustments	-67,563	-13,000
Total, Materials Support & Other Defense Programs	<u>\$1,326,301</u>	<u>\$1,432,159</u>

Defense Nuclear Waste Disposal

Defense Nuclear Waste Disposal	<u>\$129,430</u>	<u>\$198,400</u>
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Department of Energy**FY 1996 Budget**

(Discretionary Budget Authority in Thousands of Dollars)

**Programs Funded by Energy and
Water Development Appropriations****Departmental Administration**

	<u>FY 1995</u>	<u>FY 1996</u>
	<u>Approp.</u>	<u>Request</u>
Office of the Secretary	\$3,416	\$3,569
Office of Policy	27,238	31,053
Chief Financial Officer	24,682	24,992
Human Resources and Administration	194,213	197,533
Congressional and Intergovernmental Affairs	5,544	5,953
Public and Consumer Affairs	4,097	4,386
Office of General Counsel	15,664	17,835
Economic Impact and Diversity	7,779	8,312
Board of Contract Appeals	758	792
Field Management	15,447	16,607
Operations Offices	114,825	117,105
Cost of Work for Others	24,356	22,826
Subtotal, Departmental Administration (Gross)	438,019	450,963
Prior Year Balances & Other Adjustments	-30,707	-11,519
Subtotal, Departmental Administration (Gross)	407,312	439,444
Revenues	-125,692	-122,306
Total, Departmental Administration (Net)	<u>\$281,620</u>	<u>\$317,138</u>

Office of the Inspector General

Inspector General	\$32,425	\$32,913
Prior Year Balances & Other Adjustments	-5,960	-1,915
Total, Office of the Inspector General	<u>\$26,465</u>	<u>\$30,998</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Energy and
 Water Development Appropriations

Power Marketing Administrations

	FY 1995 <u>Approp.</u>	FY 1996 <u>Request</u>
Alaska Power Administration	\$6,494	\$4,260
Bonneville Power Administration (non-add)	(147,100)	(-107,300)
Southeastern Power Administration	30,541	29,902
Southwestern Power Administration	30,556	30,292
Western Area Power Administration	327,496	314,372
Falcon and Amistad Operating and Maintenance Fund	—	1,000
Colorado River Basin	—	-10,000
Subtotal, Power Marketing Administrations	395,087	369,826
Transfer of Current Authority from DOI	7,472	4,556
Use of Prior Year Balances & Other Adjustments	-122,561	-18,593
Total, Power Marketing Administrations	<u>\$279,998</u>	<u>\$355,789</u>

Federal Energy Regulatory Commission

Natural Gas and Oil Regulation	\$73,003	\$67,354
Hydropower Regulation	57,531	49,967
Electric Power Regulation	35,639	34,246
Subtotal, Federal Energy Regulatory Commission	166,173	151,567
Use of Prior Year Balances & Other Adjustments	—	-15,000
Revenues	-166,173	-136,567
Total, Federal Energy Regulatory Commission	<u>—</u>	<u>—</u>

Nuclear Waste Disposal Fund

Discretionary Funding	\$392,800	—
Mandatory Funding (non-add)	—	(431,600)
Total, Nuclear Waste Disposal Fund	<u>\$392,800</u>	<u>—</u>

Total, Programs Fund by Energy and Water Development Appropriations	<u>\$15,954,846</u>	<u>\$16,627,825</u>
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Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Interior and Related
 Agencies Appropriations

Fossil Energy Research and Development

	FY 1995 <u>Approp.</u>	FY 1996 <u>Request</u>
Coal		
Advanced Clean Fuels Research	\$38,521	\$16,572
Advanced Clean/Efficient Power Systems	90,514	73,384
Advanced Research & Technology Development	25,358	24,925
Total, Coal	154,393	114,881
Petroleum		
Oil Technology	81,708	86,773
Gas		
Natural Gas Research	66,691	90,381
Fuel Cells	49,582	55,464
Total, Gas	116,273	145,845
Program Direction and Management Support		
Headquarters Program Direction	12,969	13,621
ETC Program Direction	59,294	56,276
Total, Program Direction and Management Support	72,263	69,897
Plant and Capital Equipment		
Capital Equipment	776	1,701
Construction	4,234	2,304
Total, Plant and Capital Equipment	5,010	4,005
Fossil Energy Environmental Restoration	16,431	18,919
Cooperative R&D	9,082	—
Fuels Conversion, Natural Gas & Electricity	3,007	2,687
Subtotal, Fossil Energy Research & Development	458,167	443,007
Use of Prior Year Balances & Other Adjustment	-16,366	-6,499
Total, Fossil Energy Research and Development	<u>\$441,801</u>	<u>\$436,508</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Interior and Related
 Agencies Appropriations

Alternative Fuels Production

	FY 1995 <u>Approp.</u>	FY 1996 <u>Request</u>
Alternative Fuels Production	-3,900	-2,400

Naval Petroleum and Oil Shale Reserves

Naval Petroleum and Oil Shale Reserves		
Reserves 1 and 2 (California)	\$164,192	\$78,828
Reserve 3 (Wyoming)	12,875	15,600
Program Direction	7,685	6,600
Total, Naval Petroleum Reserves	184,752	101,028
Naval Oil Shale Reserves	2,296	—
Total, Naval Petroleum and Oil Shale Reserves	<u>\$187,048</u>	<u>\$101,028</u>

Energy Conservation

Transportation Sector	\$206,257	\$258,483
Industrial Sector	135,193	170,349
Buildings Sector	115,636	152,546
Technical & Financial Assistance (non-grants)	40,359	44,773
Policy and Management	8,342	11,166
Utility Sector	8,756	9,786
Subtotal, Energy Conservation R&D	514,543	647,103
Technical & Financial Assistance (grants)	279,368	276,458
Subtotal, Energy Conservation	793,911	923,561
Less: Recoveries from Petroleum Overcharge	-20,876	-17,000
Use of Prior Year Balances & Other Adjustment	-2,232	-16,000
Total, Energy Conservation	<u>\$770,803</u>	<u>\$890,561</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Interior and Related
 Agencies Appropriations

Economic Regulation

	FY 1995 <u>Approp.</u>	FY 1996 <u>Request</u>
Economic Regulatory Administration/Compliance	\$5,691	\$3,700
Office of Hearings and Appeals	6,742	6,800
Procurement Reform/GSA Rent Reduction (OHA)	-20	—
Total, Economic Regulation	<u>\$12,413</u>	<u>\$10,500</u>

Emergency Preparedness

Energy Emergency Planning and Operations	\$3,610	\$3,587
Emergency Response and Preparedness	4,623	4,632
Total, Emergency Preparedness	<u>\$8,233</u>	<u>\$8,219</u>

Strategic Petroleum Reserve

SPR - Facilities Development		
SPR Facilities Development	\$226,938	\$193,862
Management	16,780	18,827
Total, SPR - Facilities Development	<u>\$243,718</u>	<u>\$212,689</u>

SPR Petroleum Account

Transfer of PY Bal. from the Petroleum Account	-\$107,764	-\$187,000
SPR Decommissioning Fund	—	100,000
Proceeds from Sales of Weeks Island Oil, SPR		
Decommissioning	—	-100,000
Total, SPR Petroleum Account	<u>-\$107,764</u>	<u>-\$187,000</u>

Department of Energy
FY 1996 Budget
 (Discretionary Budget Authority in Thousands of Dollars)
 Programs Funded by Interior and Related
 Agencies Appropriations

Energy Information Administration

	<u>FY 1995</u> <u>Approp.</u>	<u>FY 1996</u> <u>Request</u>
Oil and Gas	\$13,860	\$13,492
Coal, Nuclear, Electric and Alternate	4,873	4,743
Energy Markets and End Use	5,841	5,841
Integrated Analysis and Forecasting	6,922	6,782
Automated Data Process	8,160	7,959
Energy Information Center	683	664
Statistical Standards	953	928
Program Direction	43,474	44,280
Subtotal, Energy Information Administration	84,766	84,689
	-200	—
Total, Energy Information Administration	<u>\$84,566</u>	<u>\$84,689</u>

Clean Coal Technology

Advance Appropriation - Round 4	\$100,000	\$100,000
Advance Appropriation - Round 5	275,000	100,000
Appropriation	-337,879	-155,019
Total, Clean Coal Technology	<u>\$37,121</u>	<u>\$44,981</u>

**Total, Programs Funded by Interior and Related
Agencies Appropriations**

\$1,674,039 \$1,599,775

Payments to States

Payments to States (non-add)	<u>(\$2,515)</u>	<u>(\$2,515)</u>
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Uranium Enrichment D&D Fund Discretionary Payments

Transfer Payment from Defense ER&WM	-\$133,700	-\$350,000
Foreign Payment	—	-45,000
Total, UE D&D Fund Discretionary Payments	<u>-\$133,700</u>	<u>-\$395,000</u>

Total Department of Energy

Total, Department of Energy	<u>\$17,495,185</u>	<u>\$17,832,600</u>
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