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Department of Energy
FY 2012 Congressional Budget Request

Budget Highlights

February 2012

Office of Chief Financial Officer

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Introduction

INNOVATION FOR AMERICA'S ENERGY, ECONOMIC, AND NATIONAL SECURITY

In his State of the Union address, President Obama said that America faces "our generation's Sputnik moment" and that we need to out-innovate, out-educate and out-build the rest of the world to capture the jobs of the 21st century. "In America, innovation doesn't just change our lives. It's how we make our living." Through innovation in promising areas like clean energy, the United States will win the future and create new industries and new jobs. To lead in the global clean energy economy, we must mobilize America's innovation machine in order to bring technologies from the laboratory to the marketplace. The Department of Energy (DOE) is on the front lines of this effort. To succeed, the Department will pursue game-changing breakthroughs, invest in innovative technologies, and demonstrate commercially viable solutions.

In addition to energy advances that spark economic growth, national security remains fundamental to the Department's mission. Through bipartisan ratification of the New START treaty with Russia, America and its global partners are leading by example in implementing the focused expansion of domestic and international activities to reduce the threat of nuclear weapons, nuclear proliferation, and unsecured or excess weapons-usable materials. The National Nuclear Security Administration (NNSA) supports the international effort to secure all vulnerable nuclear materials around the world within four years. The NNSA also fulfills the President's commitment to modernize the nation's nuclear stockpile until a world without nuclear weapons can be realized.

The Department's Fiscal Year (FY) 2012 budget request is $29.5 billion, an 11.8 percent or $3.1 billion increase from FY 2010 current appropriation levels. The FY 2012 request supports the President's goals to increase America's competitiveness by making strategic investments in our nation's clean energy infrastructure and to strengthen our national security by reducing the global threat of nuclear materials. The President has called for advancing research on clean energy technologies and manufacturing, doubling the share of electricity generated from clean energy supplies by 2035, and putting one million electric vehicles on the road by 2015. The Department's request prepares for a multi-year effort to address these interconnected objectives and prioritizes research and development of renewable energy technologies to expand sustainable energy options for the United States.

The FY 2012 budget builds on the intense planning, execution, and oversight of the $35.2 billion from the American Recovery and Reinvestment Act of 2009. By the end of FY 2010, the Department successfully obligated $32.7 billion of Recovery Act funds, including all funding that was set to expire. In developing the FY 2012 budget request, the Department has taken these investments into account and will oversee execution of these funds with value to the taxpayer in mind. Recovery Act investments are focused on: energy conservation and renewable energy sources ($16.8 billion), environmental cleanup ($6 billion), loan guarantees for renewable energy and electric power transmission projects ($2.4 billion), grid modernization ($4.5 billion), carbon capture and sequestration ($3.4 billion), basic science research ($1.6 billion), and the Advanced Research Projects Agency – Energy ($0.4 billion). The Department's Recovery Act activities are strengthening the economy by providing much-needed investment, saving or creating tens of thousands of jobs, cutting carbon pollution, and reducing U.S. dependence on oil.

The President's FY 2012 Budget supports three strategic priorities:

- **Transformational Energy:** Accelerate the transformation to a clean energy economy and secure U.S. leadership in clean energy technologies.
- **Economic Prosperity:** Strengthen U.S. science and engineering efforts to serve as a cornerstone of our economic prosperity and lead through energy efficiency and secure forms of energy.
- **Nuclear Security:** Enhance nuclear security through defense, nonproliferation, naval reactors, and environmental cleanup efforts.

As the President has articulated, innovation is essential to America's economic competitiveness. To meet the challenge of 'our generation's Sputnik moment,' the Department to support a coordinated strategy for research and development across all of its programs. With every initiative the Department undertakes, sound science is at the core. In FY 2012, we will increasingly emphasize cross-cutting initiatives to link science throughout the Department, specifically with energy and national security programs in order to deliver results to the American taxpayer. In the Office of Science, the Department requests $5.4 billion, a 9.1 percent or $452 million increase over the FY 2010 current appropriation levels, to support an elevated focus on the advancement of the United States' leadership in fundamental research. Advanced Research Projects Agency – Energy (ARPA-E) is building on established gains since its creation in FY 2009 to perform transformational research

and create game-changing breakthroughs for eventual market adoption. The FY 2012 budget request includes $550 million for ARPA-E to sustain investment in new energy technologies.

Energy Innovation Hubs play a key role in solving specific energy challenges by convening and focusing top scientific and engineering talent to focus on those problems. The Department is proposing to double its commitment to this research approach by requesting three new Hubs to focus on batteries and energy storage, critical materials, and Smart Grid technologies and systems. The Department will continue funding the three Energy Innovation Hubs introduced in FY 2010 to focus on developing fuels that can be produced directly from sunlight, improving energy efficient building systems design, and using modeling and simulation tools to create a virtual model of an operating advanced nuclear reactor. Each of these Hubs will bring together a multidisciplinary team of researchers in an effort to speed research and shorten the path from scientific discovery to technological development and commercial deployment of highly promising energy-related technologies. Complementing the Hubs, the Department plans in FY 2012 to continue coordination with the Office of Science's Energy Frontier Research Centers, which exemplify the pursuits of broad-based science challenges for energy applications.

Energy Security: Promoting America's Energy Security through Reliable, Clean and Affordable Energy

In his State of the Union address, the President outlined clearly to the American people his roadmap for reinventing our nation's energy policy to meet the demands of future generations. "Instead of subsidizing yesterday's energy, let's invest in tomorrow's," he said. To meet the President's challenge, the Department must recruit the sharpest research minds and build on its aggressive discovery agenda across all programs to achieve breakthroughs on the most pressing energy challenges facing the United States.

In his address, President Obama laid out a goal for clean energy sources to account for 80 percent of America's electricity by 2035. In FY 2012, the Department requests funds to help achieve this Presidential objective and address many of the energy delivery challenges facing American families and energy providers.

- **Applied Research and Development –** Meeting the President's goal of making America the first country to have one million electric vehicles on the road by 2015, the Department will research cost competitive methods to develop electric vehicles, increase the adaptability and capacity of the grid to enable vehicle charging, and send them to the nation's roadways. The Department will also launch competitive manufacturing research for breakthrough technologies in energy efficiency diagnostics and retrofits to help business owners around the country save money on energy costs.

Clean and Sustainable Energy

Energy sustainability ensures energy security as well as economic security. During the past year, the Department of Energy made investments that increase America's access to clean and sustainable sources of energy for today and tomorrow.

- Developing the next generation of biofuels is critical to efforts to end America's dependence on oil while creating new jobs that cannot be outsourced. The Department of Energy's Bioenergy Research Centers are pursuing the basic research underlying a range of high-risk, high-return biological solutions for bioenergy applications.

- By investing in electricity grid scale energy storage demonstrations and renewable generation sources, the Department is advancing Americans' access to reliable, clean power for their homes and places of work.

- Through its Loan Guarantee Program, DOE is supporting the development of renewable energy projects that when completed, will power hundreds of thousands of homes while dramatically reducing CO_2 emissions. DOE Loan Programs have already supported several projects including:

    - NRG 's Agua Caliente Solar – the world's largest solar generating facility, in Arizona. With the expected completion date of 2014, this 290-megawatt thin-film solar project will power about 100,000 homes.

    - Caithness Shepherds Flat Wind Farm – the world's largest wind farm, in Oregon. This project is estimated to reduce CO_2 emissions by 1.2 million tons per year.

- One of the most promising areas in the energy arena is in small modular reactors (SMRs). If we can develop this technology in the U.S. and build these reactors with American workers, we will have a key competitive edge. SMRs would be less than one-third the size of current nuclear plants and their compact design would allow them to be made in factories and transported to sites by truck or rail, reducing the risk of nuclear proliferation.

- **Loan Guarantees:** The Loan Programs Office (LPO) is a vital tool for promoting innovation in the energy sector across a broad portfolio of clean and efficient energy technologies. In FY 2012, the Department is requesting credit subsidies to support approximately $1 to $2 billion in loan guarantees for renewable energy deployment and up to $36 billion in additional authority to provide loan guarantees for nuclear power projects. The Department will also continue to accelerate the issuance of loan guarantees to leverage private sector investment in clean energy and energy efficiency projects that will save and create jobs.

- **Better Buildings Initiative:** To advance clean energy usage in our communities, the Department requests $100 million in credit subsidy for a pilot program, called the Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools, and Hospitals. This pilot program will guarantee up to $2 billion in loans for energy efficiency retrofits for buildings that serve as community assets, such as universities, schools, and hospitals. And to achieve a 20 percent improvement in commercial energy usage, the Department's FY 2012 request will increase R&D funding for building technologies and make financing opportunities available through the Race to Green competitive grant program for state and municipal governments that are improving efficiency standards in their communities. The Department will also work with CEOs and university presidents through the Better Buildings challenge to make their organizations leaders in saving energy.

- **Electricity Reliability and Energy Management:** Reliable, affordable, efficient, and secure electric power is vital to expanding economic recovery, protecting critical infrastructures, and enabling the transition to renewable energy sources. The FY 2012 request invests $238 million to bring the next generation of grid modernization technologies closer to deployment and commercialization, to assist states and regional partners in grid modernization efforts, and to facilitate recovery from energy supply disruptions when they occur. The request includes a new Smart Grid Technology and Systems Hub that will address the total electricity system, covering applied science, technology, economic, and policy issues that affect our ability to modernize the grid. The FY 2012 request also plans an expansion of the Home Energy Score program that provides homeowners with information on how their homes can be more energy efficient and guidance for saving on home energy costs.

Investing in energy efficiency, renewable energy generation, and grid modernization are fundamental steps necessary for creating a clean energy economy. We must also invest in the improvement of existing sources of energy that will provide a bridge between current and future technologies. These technologies are already a major segment of the energy mix and will play a critical role in providing a solid foundation that will make possible the creation of a new energy economy.

- **Leadership in Nuclear Energy:** Nuclear energy currently supplies approximately 20 percent of the Nation's electricity and 70 percent of the Nation's clean, non-carbon electricity. The request for the Office of Nuclear Energy includes $380 million for research and development, in addition to key investments in supportive infrastructure. In addition, the Department is engaging in cost-shared activities with industry that may help accelerate commercial deployment of small modular reactors. The request includes funding for cost-shared design certification and licensing activities for small modular reactors, the deployment of which holds promise for vastly increasing the generation of clean energy on a cost competitive basis. The Department will also promote nuclear power through the Loan Guarantee Program, which is requesting up to $36 billion in additional loan guarantee authority in FY 2012.

- **Experience in Advanced Fossil Energy:** The world will continue to rely on coal-fired electrical generation to meet energy demand. It is imperative that the United States develop the technology to ensure that base-load electricity generation is as clean and reliable as possible. The Office of Fossil Energy requests $452.9 million for research and development of advanced coal-fueled power systems and carbon capture and storage technologies. This will allow the continued use of the abundant domestic coal resources in the U.S. while reducing greenhouse gas emissions.

- **Ending Tax Subsidies to Fossil Fuel Producers:** In accordance with the President's agreement at the G-20 Summit in Pittsburgh to phase out subsidies for fossil fuels so that we can transition to a 21st century energy economy, the Administration proposes to repeal a number of tax preferences available for fossil fuels. Tax subsidies proposed for repeal include, but are not limited to: the credit for oil and gas produced from marginal wells; the deduction for costs paid or incurred for any tertiary injectant used as part of a tertiary oil recovery method; the ability to claim the domestic manufacturing deduction against income derived from the production of oil and gas and coal; and expensing the exploration and development costs for coal.

Economic Security: Sharpening America's Competitive Edge through a Clean Energy Economy

To meet "our generation's Sputnik moment" and promote economic competitiveness, the U.S. must demonstrate leadership in clean energy technologies. "We'll invest in biomedical research, information technology and especially clean energy technology – an investment that will strengthen our security, protect our planet, and create countless new jobs for our people," said President Obama before Congress in the State of the Union address. President Obama outlined his comprehensive vision to lead our nation's clean energy economy and provide economic security to Americans. As the Administration seeks to reduce federal government spending, the Department recognizes its role and has tightened its expenditures in several areas such as oil and natural gas. The FY 2012 budget request acknowledges the Department's missions to achieve these imperative goals while setting forth a clean energy economy for entrepreneurs and manufacturers to reclaim their competitive edge in clean energy innovation.

The Department plans to promote economic security by building on the progress made through the over $32 billion in grants and contracts under the American Recovery and Reinvestment Act of 2009, which made historic investments in the nation's economy and has put the country on target to double renewable energy generation by 2012. The Recovery Act helped create tens of thousands of jobs and, combined with the FY 2012 request, will help the Department accelerate the transition of our nation to a clean energy economy.

The President's FY 2012 Budget supports the plan to rebuild our economy through clean energy research and development by:

- **Expanding ARPA-E to spur innovation –** The President's request proposes $550 million for the Advanced Research Projects Agency – Energy (ARPA-E) program with the FY 2012 request. ARPA-E performs transformational and cutting edge energy research with real-world applications in areas ranging from grid technology and power electronics to batteries and energy storage. The budget also supports programs with significant promise to provide reliable, sustainable energy across the country, such as the SunShot initiative aimed at making solar energy cost competitive. With focused investment in manufacturing innovation and industrial technical efficiencies, the President's proposal will move private sector capital off the shelves and into the marketplace.

- **Targeting investments for future economic growth –** To secure a competitive advantage in high-tech industries and maintain international leadership in scientific computing, we will invest in core research activities for energy technologies, the development of general biological design principles and new synthetic molecular toolkits to improve understanding of natural systems, and core research activities to advance the frontiers of high performance computing. Underlying these investments in research is the education and training of thousands of scientists and engineers who contribute to the skilled scientific workforce needed for a 21st century innovation economy.

- **Doubling the number of Energy Innovation Hubs to solve key challenges –** Innovation breakthroughs occur when scientists collaborate on focused problems. The FY 2012 budget request proposes three new Energy Innovation Hubs that will bring top American scientists to work in teams on critical energy challenges in areas such as critical materials, batteries and energy storage, and Smart Grid technologies.

- **Integrating Research & Development:** The Department has identified areas where coordinated work by discovery-oriented science and applied energy technology programs hold the greatest promise for progress in achieving our energy goals. The Energy Systems Simulation to increase the efficiency of the Internal Combustion Engine (ICE) will produce a set of modern, validated computer codes that could be used by design engineers to optimize the next

Recovery Act Achievements for Economic Security

Through the American Recovery and Reinvestment Act, the Department of Energy awarded more than $32 billion to put Americans to work while helping to build a clean energy economy, spur energy innovation, and reduce our dependence on imported oil.

Through the Recovery Act, the Department of Energy:

- Awarded more than $4 billion in funding to implement a Smart Grid, deploying 18 million smart meters and more than 1,000 sensors for the grid. As of December 2010, the Department has helped install over 2.5 million of these meters.
- Invested in advanced battery research and technologies and supported the construction of twenty battery factories -- factories that will provide good manufacturing jobs in the United States. These factories are on track to produce over 500,000 electric vehicle battery packs by 2015, a substantial contribution towards the President's goal of 1 million electric vehicles on the road by 2015.
- Delivered energy and cost savings for hundreds of thousands of American families while creating thousands of clean energy jobs in local communities through the weatherization of more than 300,000 homes as of the end of December 2010, on our way to our goal of almost 600,000 homes weatherized with Recovery Act funds by 2013 and a total of one million housing units retrofitted by the end of 2014.

The American Recovery and Reinvestment Act is a critical down-payment on our clean energy future.

generation of cleaner, more efficient combustion engines. An initiative on extreme environments will close the gap between actual and ideal performance of materials in nuclear environments. And the Department's Exascale Computing initiative will allow the Department to take the lead in developing the next generation of scientific tools and to advance scientific discoveries in solving practical problems.

- **Pursuing the passage of HOMESTAR** – Enactment of this program will create jobs by providing strong short-term incentives for energy efficiency improvements in residential buildings. The HOMESTAR program has the potential to accelerate our economic recovery by boosting demand for energy efficiency products and installation services. The program will provide rebates of $1000 to $3000 per household to encourage immediate investment in energy-efficient appliances, building mechanical systems and insulation, and whole-home energy efficiency retrofits. This program will help middle-class families save hundreds of dollars a year in energy costs while improving the comfort and value of their most important investment – their homes. In addition, the program would help reduce our economy's dependence on oil and support the development of an energy efficiency services sector in our economy.

- **Extending access to tax credit and tax grant programs** – Two provisions of the American Recovery and Reinvestment Act have been extraordinarily successful in spurring the deployment of renewable energy projects and building advanced manufacturing capabilities: Section 48C Advanced Energy Manufacturing Tax Credit program and the Section 1603 Energy Cash Assistance program. The Administration is pursuing an additional $5 billion in support for the Section 48C program, which, by providing a 30% tax credit for energy manufacturing facilities, will continue to help build a robust high-technology, U.S. manufacturing capacity to supply clean energy projects with U.S. made parts and equipment. The Section 1603 tax grant program has created tens of thousands of jobs in industries such as wind and solar by providing up-front incentives to thousands of projects. The Administration is seeking a one-year extension of this program.

- **Promoting efficient energy use in our everyday lives** - Currently, over 50 percent of the goal to weatherize 600,000 homes of low income families has been achieved, providing energy cost savings and financial relief to households. The FY 2012 request of $320 million continues residential weatherization, while increasing the focus on new innovative approaches to residential home weatherization.

National Security: Securing Nuclear and Radiological Materials, Maintaining Nuclear Deterrence, and Advancing Responsible Legacy Cleanup

A pillar of President Obama's national security agenda for the United States is to eliminate the global threat posed by nuclear weapons and prevent weapons-usable nuclear material from falling into the hands of terrorists. As part of this agenda, the Administration and Congress worked tirelessly toward the December 2010 bipartisan ratification of the New Strategic Arms Reduction Treaty (New START) with Russia, which cuts the number of strategic nuclear weapons each country can deploy to 1,550. After signing this agreement in April 2010, President Obama said, "In many ways, nuclear weapons represent both the darkest days of the Cold War, and the most troubling threats of our time. Today, we've taken another step forward … in leaving behind the legacy of the 20th century while building a more secure future for our children. We've turned words into action. We've made progress that is clear and concrete. And we've demonstrated the importance of American leadership -- and American partnership -- on behalf of our own security, and the world's".

The Department's National Nuclear Security Administration (NNSA), through work with global partners and efforts to secure vulnerable nuclear materials, achieved significant milestones during FY 2010 and FY 2011 to reduce the risk of proliferation and leverage science to maintain our nation's nuclear deterrence. Additionally, the Environmental Management program made progress advancing responsible nuclear cleanup from the Cold War. The Department's FY 2012 request seeks to build upon these successes and advance the President's nuclear security agenda.

Reduce the Risk of Proliferation

In 2009, President Obama committed the United States to an international effort to secure vulnerable nuclear material worldwide in four years. To solidify international support for this effort, and to address the threat of nuclear terrorism, the President convened leaders from 47 countries at the Washington Nuclear Security Summit in April 2010. The Summit resulted in a Communiqué which stated, "Nuclear terrorism is one of the most challenging threats to international security, and strong nuclear security measures are the most effective means to prevent terrorists, criminals, or other unauthorized actors from acquiring nuclear materials."

The FY 2012 budget for the NNSA Defense Nuclear Nonproliferation program will help advance further work that is needed to meet the goals of President Obama and the Nuclear Security Summit, recognizing the urgency of the threat and making the full commitment to global cooperation on nonproliferation. The budget provides $2.5 billion in FY 2012, and $14.2 billion through FY 2016 to detect, secure, and dispose of dangerous nuclear and radiological material worldwide. This request is a decrease of 5 percent, or $138 million, from the FY 2011 request, which reflects completion of accelerated efforts to secure vulnerable nuclear materials within the President's stated timeframe. The decrease also reflects our decision to await agreement between the United States and Russia on detailed implementation milestones prior to requesting additional U.S. pledged funding to support Russian plutonium disposition. The FY 2012 budget request follows through on securing vulnerable materials and supports efforts to design new technologies in support of treaty monitoring and verification, which will contribute to implementation of New START. The budget also broadens cooperative nonproliferation initiatives with foreign governments and international organizations in support of the President's objective of a world without nuclear weapons. The budget continues the provision of security upgrades at selected sites, both within the United States and in foreign countries, to address outsider and insider threats, and accelerates the pace of research reactor conversions from use of highly-enriched uranium fuel to low-enriched uranium fuel.

Leverage Science to Maintain Nuclear Deterrence

The FY 2012 budget request advances the Department's commitment to the national security interests of the United States through stewardship of a safe, secure and effective nuclear weapons stockpile without the use of underground nuclear testing. The 2010 Nuclear Posture Review Report calls for the United States to reduce nuclear force levels. As the United States begins the reduction required by New START, the science, technology and engineering capabilities and intellectual capacity within the nuclear security enterprise become more critical to sustaining the U.S. nuclear deterrent. NNSA continues to emphasize these capabilities, including functioning as a national science, technology, and engineering resource to other agencies with national security responsibilities. Through the NNSA, the Department requests $7.6 billion for the Weapons Activities appropriation, an 8.9 percent, or $621 million, increase from the President's FY 2011 request. It also is an 18.9 percent, or $1.205 million increase from the FY 2010 enacted appropriation. This increase reflects an investment strategy that provides a strong basis for transitioning to a smaller yet still safe, secure and effective nuclear stockpile without additional nuclear testing, strengthening the science, technology and engineering base, modernizing the physical infrastructure, and streamlining the enterprise's physical and operational footprint. These investments will further enable the Nuclear Posture Review's comprehensive nuclear defense strategy, based on current and projected global threats that rely less on nuclear weapons, while strengthening the nation's nuclear deterrent through completing major stockpile system life extensions, stabilizing the science, technology and engineering base, and modernizing the infrastructure.

The Naval Reactors program ensures the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers, constituting 45 percent of the U.S. Navy's combatants. The FY 2012 request for Naval Reactors of $1.2 billion, is an increase of $83.2 million or 7.8 percent over the FY 2011 request and $209 million or 18.1 percent above the FY 2010 enacted appropriation. Funding for this program is ramping up for reactor design and development efforts for the Ohio Class Replacement Submarine ($121 million), refueling of the Land-Based Prototype ($99.5 million), and recapitalization of the naval spent nuclear fuel infrastructure for the Spent Fuel Handling Recapitalization program ($53.8 million) at the Naval Reactors Facility located at the Idaho National Laboratory.

Advance Responsible Environmental Cleanup

The FY 2012 budget includes $6.13 billion for the Office of Environmental Management (EM), to protect public health and safety by cleaning up hazardous, radioactive legacy waste from the Manhattan Project and the Cold War. This funding will allow the program to continue to accelerate cleaning up and closing sites, focusing on activities with the greatest risk reduction. Acceleration of cleaning up sites where funding would have immediate impact was established as the overarching objective of the $6 billion in Recovery Act funding. EM will use the remaining $309 million of Recovery Act funding during FY 2012 as it completes footprint reduction and near-term completion cleanup activities.

As the Department continues to make progress in completing environmental cleanup, the FY 2012 budget request of $170 million for the Office of Legacy Management supports the Department's long-term stewardship responsibilities and payment of pensions and benefits for former contractor workers after site closure.

Office of Science: Invest in the Building Blocks of American Innovation

The Department of Energy's Office of Science (SC) delivers scientific discoveries and major scientific tools to transform our understanding of energy and matter and advance the energy, economic, and national security of the United States. SC is the largest Federal sponsor of basic research in the physical sciences, supporting programs in areas such as physics, chemistry, biology, environmental sciences, applied mathematics, and computational sciences. In FY 2012, the Department requests $5.4 billion, an increase of 9.1 percent over the FY 2010 current appropriation, to invest in basic research. The FY 2012 request supports the President's *Strategy for American Innovation*, and is consistent with the goal of doubling funding at key basic research agencies, including the Office of Science. The FY 2012 Office of Science budget request supports the following objectives from the *Strategy*, including:

- Unleash a clean energy revolution
- Strengthen and broaden American leadership in fundamental research
- Develop an advanced information technology ecosystem
- Educate the next generation with 21st century skills and create a world-class workforce

In FY 2012, SC continues to support fundamental research for scientific discovery, but today our country needs to move strongly to solve our energy problems. Therefore, the central theme of this year's budget in SC is research in new technologies for a clean energy future that address competing demands on our environment. These efforts, coordinated with the DOE applied technology programs and with input from the scientific community and industry, will emphasize research underpinning advances in non-carbon emitting energy sources, carbon capture and sequestration, transportation and fuel switching, transmission and energy storage, efficiency, and critical materials for energy applications.

In the area of advancing non-carbon energy sources, the FY 2012 budget request will provide for new investments in the science of interfaces and degradation relevant to solar photovoltaics, basic actinide chemistry research related to advanced nuclear fuel cycles, and research in materials under extreme environments relevant to extreme nuclear technology environments, and genomics-based research on biological design principles and synthetic biology tools to underpin bio-based energy solutions. Carbon capture and sequestration research will focus on novel molecular design for materials and multiscale dynamics of flow and plume migration, respectively. SC will initiate an energy systems simulation research effort focused on predictive modeling of combustion in an evolving fuel environment in support of the Department's efforts in transportation and alternative fuels. Also underpinning transportation and fuel switching, as well as energy storage, the FY 2012 request will support an Energy Innovation Hub for Batteries and Energy Storage. The Fuels from Sunlight Hub, established in FY 2010, as well as the Energy Frontier Research Centers and DOE Bioenergy Research Centers also continue. Research in enabling materials sciences will support needs of future electricity transmission systems and novel building materials to improve building efficiencies.

Exascale Computing

The Department of Energy has identified exascale computing as a critical need for the United States to maintain international leadership in advanced scientific computing for energy and national security applications.

Exascale computers are supercomputers that can execute one million trillion calculations per second. They are integral to simulating complex systems, presenting the opportunity to understand grand challenges like climate change, nuclear warhead explosions, or protein interactions inside of cells through modeling and simulation.

Exascale computers will make a significant contribution to our efforts to:

- Develop domestic energy sources in economically viable and environmentally friendly ways
- Understand the complex biogeochemical cycles that underpin ecosystems and control the sustainability of life on Earth
- Analyze, design, and stress-test critical systems such as communications, homeland security, and defense systems

These investments position the U.S. to secure a competitiveness advantage in high-tech and information technology industries and win the future.

The FY 2012 budget request also provides for foundational science in condensed matter and materials physics, chemistry, biology, climate and environmental sciences, applied mathematics, computational and computer science, high energy physics, nuclear physics, plasma physics, and fusion energy sciences; and provides for research facilities and capabilities that keep U.S. researchers at the forefront of science. The FY 2012 request supports targeted increases in areas such as computational materials and chemistry by design, nanoelectronics, and advanced scientific applications and

integrated application-hardware-software co-design for exascale, which position the U.S. to secure a competitive advantage in high-tech industries and maintain international leadership in scientific computing. Underlying these investments is the education and training of thousands of scientists and engineers who contribute to the skilled scientific workforce needed for the 21st century innovation economy.

The Office of Science supports investigators at about 300 academic institutions and from all of the DOE laboratories. Over 26,000 researchers from universities, national laboratories, industry, and international partners are expected to use the Office of Science scientific user facilities in FY 2012.

Advanced Research Projects Agency – Energy: Transformational Research and Development

The FY 2012 budget request includes $550 million for the Advanced Research Projects Agency – Energy (ARPA-E), a program launched in FY 2009 that sponsors specific high-risk and high-payoff transformational research and development projects that overcome the long-term technological barriers in the development of energy technologies to meet the Nation's energy challenges, but that industry will not support at such an early stage. An additional $100 million in mandatory funding is also proposed from the Wireless Innovation Fund for developing cutting-edge wireless technologies. An essential component of ARPA-E's culture is an overarching focus on accelerating science to market. Beyond simply funding transformational research creating revolutionary technologies, ARPA-E is dedicated to the market adoption of those new technologies that will fuel the economy, create new jobs, reduce energy imports, improve energy efficiency, reduce energy-related emissions, and ensure that the U.S. maintains a technological lead in developing and deploying advanced energy technologies.

Office of Energy Efficiency and Renewable Energy: Investing in Breakthrough Technology and a Clean Energy Future

The **Office of Energy Efficiency and Renewable Energy (EERE)** supports research, development, demonstration, and deployment activities on technologies and practices essential for meeting national security goals by reducing dependence on oil, meeting environmental goals by minimizing the emissions associated with energy production and use, and stimulating economic growth and job creation by minimizing the cost of energy services. The EERE portfolio emphasizes work areas where the potential impact is largest, where Federal funds are most critical. It balances investments in high-risk research with partnerships with private firms that speed the translation of innovations into practical business opportunities. The diverse set of technologies supported helps ensure that the U.S. has many options for meeting its energy goals. Program management is designed to identify the best groups in the country to address these challenges and supports work in universities, companies, national laboratories, and consortia.

An Energy Security Strategy of Practical Innovation

DOE's Energy Efficiency and Renewable Energy (EERE) program continues an ambitious practical energy security strategy through promoting conservation, efficiency and cost savings as well as investing in cutting-edge renewable technologies that will compete with the price of fossil energy:

Building Technologies Program: Currently, commercial buildings represent over 30 percent of U.S. electricity demand. Building upon over 30 pilot programs under the Recovery Act focusing on residential upgrades, DOE is requesting $100 million for a new major competitive program to improve the efficiency of the commercial sector. An additional $60 million is requested as part of the the Better Buildings Initiative to retrofit commercial buildings, a critical step to achieving Administration goals for emissions reductions.

Industrial Technologies Program: The $320 million request includes a major new initiative focused on advanced materials and manufacturing processes, supporting a renaissance of the American manufacturing sector.

Solar Technologies Program: This FY12 budget request supports an ambitious program to reduce the cost of an installed solar photovoltaic system to price parity to fossil-based electricity, significantly less than the cost today.

The FY 2012 budget request of $3.2 billion, the increase of 44.4% over the FY 2010 current appropriation, is aimed at accelerating innovation and change in the Nation's energy economy. The request includes programs associated with meeting the President's goals of investing in the next generation of clean energy technologies, vehicles and fuels, and energy efficiency measures that reduce energy use in Federal agencies and the industrial and building sectors.

Clean, Renewable Energy Generation

The FY 2012 budget request continues to work to transform the Nation's energy infrastructure by investing over $1,164.9 million in a variety of renewable programs including solar ($457.0 million), wind ($126.9 million), water ($38.5 million), hydrogen ($100.5 million), biomass ($340.5 million), and geothermal ($101.5 million). Research, development, and deployment of these technologies will reduce the production of greenhouse gas emissions and revitalize an economy built on the next generation of domestic production. The request includes the solar SunShot program which will invest in transformative research

focusing on achieving radical cost reductions in photovoltaic modules, balance of systems, and power electronics.

Energy Efficiency

The Department implements a number of efforts to increase energy efficiency in homes, transportation, and industry. The FY 2012 budget requests $1,805.3 million to accelerate deployment of clean, cost-effective, and rapidly deployable energy efficiency measures in order to reduce energy consumption in residential and commercial buildings, and the industrial and Federal sectors. The Department will invest $470.7 million in the Building Technologies program and $33.0 million for the Federal Energy Management Program. Federal assistance for state-level programs such as State Energy Program ($63.8 million), Tribal ($10.0 million) and Weatherization Assistance Program ($320.0 million) will continue to help citizens implement energy efficiency measures, lower energy costs and greenhouse gas emissions, and build a technical workforce. ($319.8 million) for Industry will provide a balanced portfolio of advanced R&D and pursuit of near-term low cost opportunities with the objectives of increasing U.S. competitiveness, enhancing clean energy manufacturing, and improving energy productivity. There will be a focus on next generation manufacturing processes and materials, activities for clean energy manufacturing, and refocused efforts for Industrial Technical Assistance to achieve greater results with less funding through more effective leveraging of funding for deployment partnerships. A new Energy Innovation Hub on critical materials will be competed through the Industrial Technologies program. The FY 2012 request also includes $588 million to accelerate research, development and deployment of advanced vehicle technologies, working in concert with biomass RD&D to reduce the use of petroleum and greenhouse gas emissions.

Better Buildings Initiative for Commercial Energy Savings **–** The President's Better Buildings Initiative is focused on achieving a 20 percent improvement in commercial buildings' energy use by 2020. The initiative will include many new components to achieve this goal, which are supported in the Department's FY 2012 request. The Department's request includes new tax incentives for commercial buildings energy efficiency, launch of the Race to Green competitive grant program for states and municipal governments to encourage higher standards for commercial energy efficiency. The FY 2012 request also supports additional energy loan authority for buildings that serve as community assets, and increase R&D funding for building technologies. The Department intends to work with the business and academic communities to make their organizations leaders in saving energy,

Office of Electricity Delivery and Energy Reliability: Enabling a Clean Energy Economy

The Office of Electricity Delivery and Energy Reliability (OE) is responsible for leading national efforts to modernize the electric grid, enhance the security of energy infrastructure, and facilitate recovery from disruptions to the energy supply. The Department's FY 2012 budget request for OE of $238 million, a 38% increase over the FY 2010 appropriation, represents a clear and determined effort to accelerate the transformation of one of the Nation's key enablers of a clean energy economy – the electricity delivery system.

The U.S. electricity delivery system was built on technology that was developed early in the 20th century and designed for the demands and challenges of that era. Today, this aging and often congested system is facing many new and complex challenges that require considerable improvements in the physical and technological components of the system. In order to alleviate the stress on the system from increasing demand for electricity and to enable greater use and integration of renewable and distributed resources, all while maintaining the reliability, security, and affordability of electric power, research and development breakthroughs and new energy management approaches are critical in the areas of transmission and distribution, energy storage, and cyber security.

OE's FY 2012 budget request provides $193 million for research and development in these critical areas to bring the next generation of grid technologies closer to deployment and commercialization. The increased investment reflects the President's vision and OE's role in competing in a worldwide technological race. As such, with $20 million in FY 2012, OE will establish a new Energy Innovation Hub, or in the words of President Obama, one of "the Apollo projects of our time." The Smart Grid Technology and Systems Hub will bring together a diverse, multi-disciplinary group to develop an integrated approach to enhancing smart grid technologies and systems. OE will also expand its advanced modeling capabilities to include other system layers in order to provide a more in-depth system understanding. The energy storage program will expand to aggressively support the deployment of grid-scale energy storage technologies with new demonstrations, and the cyber security program will continue to focus on the development and integration of secure control systems.

The budget request continues to support Permitting, Siting, and Analysis (PSA) with $8 million to develop and improve policies, state laws, and programs that facilitate the development of electric infrastructure needed to bring new clean energy

projects to market, and to provide technical assistance to states and regions. It also supports Infrastructure Security and Energy Restoration (ISER) with $6.2 million to enhance the reliability and resiliency of critical energy infrastructure and to facilitate recovery from energy supply disruptions.

Office of Environmental Management: Meeting Commitments and Making Progress

The mission of the Office of Environmental Management (EM) is to complete the safe cleanup of the environmental legacy brought about from over six decades of nuclear weapons development, production, and Government-sponsored nuclear energy research. This cleanup effort is the largest in the world, originally involving two million acres at 110 sites in 35 states, dealing with some of the most dangerous materials known to man.

EM continues to pursue its cleanup objectives within the overall framework of achieving the greatest comparative risk reduction benefit and overlaying regulatory compliance commitments and best business practices to maximize cleanup progress. To support this approach, EM has prioritized its cleanup activities:

- Activities to maintain a safe and secure posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High priority groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning

The FY 2012 budget request for $6.13 billion will fund activities to maintain a safe and secure posture in the EM complex and make progress against program goals and compliance commitments by reducing the greatest risks to the environment and public health, using science and technology to reduce lifecycle costs, and reducing EM's geographic footprint by 90 percent by 2015. EM continues to move forward with the development of the capability for dispositioning tank waste, nuclear materials, and spent (used) nuclear fuel. The budget request includes the construction and operation of three unique and complex tank waste processing plants to treat approximately 88 million gallons of radioactive tank waste for ultimate disposal. It will also fund the solid waste disposal infrastructure needed to support disposal of transuranic and low-level wastes generated by high-risk activities and the footprint reduction activities.

Environmental Management Progress

During FY 2010 the Environmental Management (EM) program made significant progress towards cleaning up Cold War legacy environmental contamination. By the end of the FY, the cleanup effort which originally encompassed 110 sites in 35 states has progressed to 18 remaining sites in 11 states. The EM program is tasked with cleaning up some of the most dangerous materials in the world, and continued progress cleaning up facilities, land and water resources frees them up for local community reuse and economic development. The President's FY 2012 EM budget request of $6.13 billion enables the program to continue this impressive record of progress.

Key EM accomplishments in FY 2010 include:

- Radioactive Tank Waste Stabilization, Treatment, and Disposal
  - ✓ Processed 689,000 gallons of vitrified high-level waste and produced 190 cans of vitrified high-level waste at the Savannah River Site.
  - ✓ Entered final construction phase of the Sodium Bearing Waste Facility in preparation for hot startup in January 2012, which will enable closure of the final four of 15 waste tanks at Idaho.
  - ✓ Strategic investments in transformational tank waste technologies, which will reduce EM's environmental liability and lifecycle cost by $3 billion at Savannah River.
- Footprint Reduction
  - ✓ Completed K-25 West Wing demolition (more than 3.2 million square feet), the highest risk facility at the Oak Ridge East Tennessee Technology Park.
  - ✓ Characterized, certified, and shipped to WIPP over 7,400 cubic meters of contact-handled and remote-handled transuranic waste from the TRU generator sites with another 14,000 cubic meters planned through FY 2012.
  - ✓ Strategically accelerated cleanup of facilities and contaminated areas in the outer reaches of many sites putting the program on track for a 90 percent reduction in area by 2015.

EM carries out its cleanup activities with the interests of stakeholders in mind. Most importantly, EM will continue to fulfill its responsibilities by conducting cleanup within a "Safety First" culture that integrates environment, safety, and health requirements and controls into all work activities to ensure protection to the workers, public, and the environment, and adheres to sound project and contract management principles. EM is also strengthening its project and planning analyses to better assess existing priorities and identify opportunities to accelerate cleanup work. Working collaboratively with the sites, EM continues to seek aggressive but achievable strategies for accelerating cleanup of discrete sites or segments of work. In addition, functional and cross-site activities such as elimination of specific

groundwater contaminants, waste or material processing campaigns, or achievement of interim or final end-states are being evaluated.

After the EM program completes cleanup and closure of sites that no longer have an ongoing DOE mission, post closure stewardship activities are transferred to the **Office of Legacy Management (LM)**. LM also receives sites remediated by the U.S. Army Corps of Engineers (Formerly Utilized Sites Remedial Action Program) and private licensees (Uranium Mill Tailings Radiation Control Act, Title II sites). Post closure stewardship includes long-term surveillance and maintenance activities such as groundwater monitoring, disposal cell maintenance, records management, and management of natural resources at sites where active remediation has been completed. At some sites the program includes management and administration of pension and post-retirement benefits for contractor retirees.

Loan Programs Office: Helping Finance Clean Energy Deployment

Innovative Technology Loan guarantee Program- To encourage the early commercial production and use of new or significantly improved technologies in energy projects, the Department requests up to $36 billion in authority to guarantee loans for nuclear power facilities and $200 million in appropriated credit subsidy for the cost of loan guarantees for renewable energy system and efficient end-use energy technology projects under section 1703 of the Energy Policy Act of 2005. The additional loan authority for nuclear power projects will promote deployment of new plants and support an increasing role for private sector financing. The additional credit subsidy will allow for investment in the innovative renewable and efficiency technologies that are critical to meeting the Administration's goals for affordable, clean energy, technical leadership, and global competitiveness.

The FY 2012 budget also requests $38 million to evaluate applications received under the eight solicitations released to date and to ensure efficient and effective management of the Loan Guarantee program., This request is expected to be offset by collections from borrowers authorized under Title XVII of the Energy Policy Act of 2005 (P.L. 109-8).

Advanced Technology Vehicle Manufacturing Program- The Department requests $6 million to support ongoing loan monitoring activities associated with the program mission of making loans to automobile and automobile part manufacturers for the cost of re-equipping, expanding, or establishing manufacturing facilities in the United States to produce advanced technology vehicles or qualified components, and for associated engineering integration costs.

Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools, and Hospitals - To spur investment in energy efficiency retrofits for buildings which serve as assets to our communities, the Department requests $100 million for loan guarantee subsidy costs to support up to $2 billion in loan authority for universities, schools, and hospitals. This pilot program is one component of the President's Better Buildings Initiative and would fund cost-effective technologies and measures to assist universities, schools, and hospitals save on energy usage and associated energy costs. The Department also requests $5 million for administrative expenses to carry out the program. The request is subject to the enactment of legislation authorizing this program.

Office of Nuclear Energy: Investing in Energy Innovation and Technical Leadership

The Department is requesting $852.5 million for the Office of Nuclear Energy (NE) in FY 2012 – a decrease of 0.6 percent from the FY 2010 current appropriation. NE's funding supports the advancement of nuclear power as a resource capable of meeting the Nation's energy, environmental, and national security needs by resolving technical, cost, safety, proliferation resistance, and security barriers through research, development, and demonstration as appropriate.

Currently, nuclear energy supplies approximately 20 percent of the Nation's electricity and over 70 percent of clean, non-carbon producing electricity. Over 100 nuclear power plants are offering reliable and affordable baseload electricity in the United States, and they are doing so without air pollution and greenhouse gas emissions. NE is working to develop innovative and transformative technologies to improve the competitiveness, safety and proliferation resistance of nuclear energy to support its continued use.

The FY 2012 budget supports a balanced set of research, development, and deployment (RD&D) activities. This program is built around exploring, through its R&D: technology and other solutions that can improve the reliability, sustain the safety, and extend the life of current reactors; improvements in the affordability of new reactors to enable

nuclear energy to help meet the Administration's energy security and climate change goals; development of sustainable nuclear fuel cycles; and minimization of risks of nuclear proliferation and terrorism.

NE is requesting $125 million for Reactor Concepts Research, Development and Demonstration. This program seeks to develop new and advanced reactor designs and technologies. NE is also requesting $67 million for the Light Weight Reactor SMR Licensing Technical Support program, which will support cost-shared design certification and licensing activities for two light water reactor-based designs. Small modular reactors are a technology that the Department believes has the promise to help meet energy security goals. Work will continue on R&D for the Next Generation Nuclear Plant to support demonstration of gas-cooled reactor technology in the United States. The program also supports research on Generation IV and other advanced designs and efforts to extend the life of existing light water reactors.

The FY 2012 request includes $155 million for Fuel Cycle Research and Development to perform long-term, results-oriented science-based R&D to improve fuel cycle and waste management technologies to enable a safe, secure, and economic fuel cycle. The budget also requests $97.4 million to support the Nuclear Energy Enabling Technologies program, focused on the development of cross-cutting and transformative technologies relevant to multiple reactor and fuel cycle concepts. The Crosscutting Technology Development activity will focus on a variety of areas such as reactor materials, creative approaches to further reduce proliferation risks, and establishing advanced modeling and simulation capabilities to complement physical experimentation. The Transformative Nuclear Concepts R&D activity supports, via an open, competitive solicitation process, investigator-initiated projects that relate to any aspect of nuclear energy generation ensuring that good ideas have sufficient outlet for exploration. Modeling and Simulation Energy Innovation Hub, supported within this program, will apply existing modeling and simulation capabilities to create a “virtual” reactor user environment to simulate an operating reactor and is a prime example of the type of crosscutting, transformative activity that will enhance many research areas within NE. NE will also continue its commitments to investing in university research, international cooperation, and the Nation’s nuclear research infrastructure – important foundations to support continued technical advancement.

Office of Fossil Energy: Sustaining American Energy Options through U.S. Ingenuity

The FY 2012 budget request of $521 million for the Office of Fossil Energy (FE) will help ensure that the United States can continue to rely on clean, affordable energy from traditional domestic fuel resources. The United States has 25 percent of the world’s coal reserves, and fossil fuels currently supply over 80 percent of the Nation’s energy.

The Department is committed to developing technologies and providing technology-based options having public benefits including enhanced economic, environmental and energy security impacts. In FER&D, the emphasis, in keeping with Presidential priorities, is in supporting long-term, high risk initiatives targeted at carbon capture and storage as well as advanced energy systems and on cross-cutting research.

In addition, $122 million of FE’s $521 million request will be to provide for national energy security through the continued operations of the Strategic Petroleum Reserve. The budget proposes to sell $500 million of SPR oil in order to provide operational flexibility in managing the Reserve.

The National Nuclear Security Administration: Leading Global Partners on Nonproliferation by Securing Vulnerable Nuclear Materials; Reaffirming Commitment to Stockpile Modernization

The National Nuclear Security Administration (NNSA) continues significant efforts to meet Administration and Secretarial priorities, leveraging science to promote U.S. national security objectives. The FY 2012 President's budget request for NNSA is $11.8 billion; an increase of 5.1 percent from the President's FY 2011 Request. The five-year FY 2012-2016 President's Request for the NNSA reflects the President's global nuclear nonproliferation priorities and his commitment to modernize the U.S. nuclear weapons complex and sustain a strong nuclear deterrent, as described in the 2010 Nuclear Posture Review (NPR) Report, for the duration of the New START Treaty and beyond. The NNSA's defense and homeland security-related objectives include:

- Ensure that the U.S. nuclear deterrent remains safe, secure and effective while implementing changes called for by the 2010 NPR and the New START Treaty
- Broaden and strengthen the NNSA's science, technology and engineering mission to meet national security needs
- Transform the Nation's Cold-War era weapons complex into a 21st century national security enterprise
- Work with global partners to secure all vulnerable nuclear materials around the world and implement the President's nuclear security agenda expressed in the May 2010 National Security Strategy and the Nuclear Posture Review report
- Provide safe and effective nuclear propulsion for U.S. Navy warships

The FY 2012 budget request of $7.6 billion for the Weapons Activities appropriation provides funding for a wide range of programs. Requested activities include providing direct support for the nuclear weapon stockpile, including stockpile surveillance, annual assessments, life extension programs, and warhead dismantlement. Science, Technology and Engineering programs are focused on long-term vitality in science and engineering, and on performing R&D to sustain current and future stockpile stewardship capabilities without the need for underground nuclear testing. These programs also provide a base capability to support scientific research needed by other elements of the Department, the federal government national security community, and the academic and industrial communities. Infrastructure programs support facilities and operations at the government-owned, contractor-operated sites, including activities to maintain and steward the health of these sites for the long term and construct new facilities that will allow the United States to maintain a credible nuclear deterrent. The unique nuclear security expertise and resources maintained by NNSA are made available through the National Laboratories to other Departmental offices, agencies and to the Nation for security and counterterrorism activities.

The Weapons Activities request is an increase of 8.9 percent over the President's FY 2011 Request. This level is sustained and increased in the later outyears. The multi-year increase is necessary to reflect the President's commitment to maintain the safety, security and effectiveness of the nuclear deterrent without underground nuclear testing, consistent with the principles of the Report on the Plan for the Nuclear Weapons Stockpile, Nuclear Weapons Complex, and Delivery Platforms (known as the "1251 Report") and the Stockpile Management Program as stipulated in Sections 1251 and 3113(a)(2) of the National Defense Authorization Act of Fiscal Year 2010. Increases are provided for direct support of the nuclear weapon stockpile, for scientific, technical and engineering activities related to maintenance assessment and certification capabilities, and for recapitalization of key nuclear facilities. The President's Request provides funding necessary to protect the national resource of human capital at the national laboratories through a stockpile stewardship program that exercises and retains these capabilities.

The FY 2012 request for Defense Nuclear Nonproliferation (DNN) is $2.5 billion; a decrease of 5.1 percent from the President's FY 2011 Request. This decrease reflects completion of long-lead procurements for the Mixed Oxide Fuel Fabrication Facility (MOX) and Waste Solidification Building (WSB). It also reflects our decision to await an agreement between the U.S. and Russia on detailed implementation milestones prior to requesting additional U.S.-pledged funding to support Russian plutonium disposition. The Administration prioritizes U.S. leadership in global nonproliferation initiatives as directed through the National Security Strategy and has advanced this agenda through commitments from global partners during the 2010 Nuclear Security Summit. In addition to the programs funded solely by the NNSA, Defense Nuclear Nonproliferation programs support interagency and international efforts to protect national security by preventing the spread of nuclear weapons and nuclear materials to terrorist organizations and rogue states. These efforts are implemented in part through the International Atomic Energy Agency, the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction, and the Global Initiative to Combat Nuclear Terrorism.

DNN supports the President's goal to secure vulnerable nuclear materials around the world within four years. The Global Threat Reduction Initiative's emphasis in FY 2012 is to convert domestic and international nuclear reactors from weapons-usable highly enriched uranium fuel to low-enriched uranium fuel (LEU); while preserving our capability to produce the critically needed Molybdenum 99 isotope. The FY 2012 President's request for International Nuclear Materials Protection and Cooperation reflects selective new security upgrades to buildings and sites in accordance with the President's goal to secure vulnerable nuclear materials around the world within four years, as well as enhancements and sustainability support for previous work. The Fissile Materials Disposition program continues domestic construction of the MOX Fuel Fabrication Facility scheduled to come online in 2016; and design for the pit disassembly and conversion capability to provide it with plutonium oxide feedstock.

Advancing the Prague Nonproliferation Agenda

In an April 2009 speech in Prague, the President unveiled a bold nonproliferation agenda, highlighted by his resolve to take steps toward a world free of nuclear weapons, and by setting the international goal of securing all vulnerable nuclear materials around the world within four years; thus imparting a renewed sense of urgency to these global security concerns.

Toward the first of these goals, the Administration placed high priority on ratification of the New Strategic Arms Reduction Treaty with Russia, and with subsequent passage of New START by both U.S. and Russian legislatures, deployed strategic nuclear weapons will be reduced from 2,200 to 1,550 by both the U.S. and Russia. This step forward will further strengthen the foundation of trust and help to build increasing international support for cooperative international nonproliferation efforts.

As a result of the 2010 Nuclear Security Summit, actionable goals were set for cooperative efforts globally. These objectives will be achieved primarily through two programs:

- *The Global Threat Reduction Initiative (GTRI)* removes unprotected nuclear material to secure locations, provides security upgrades to global facilities from which the material cannot be removed, and converts research reactors to use non-weapons-usable fuel. Through FY 2012, GTRI will have converted or verified shutdown prior to conversion of 83 research reactors, removed 3,555 kilograms of vulnerable nuclear material, and secured an estimated 1,239 buildings containing high priority nuclear or radiological materials.
- *The International Material Protection and Cooperation (INMP&C) program* acts to prevent nuclear terrorism by securing facilities that contain nuclear material. Through FY 2012 INMP&C will have completed nuclear security upgrades at 221 of 229 buildings estimated for completion by the end of FY 2013 containing weapons-grade material in the former Soviet Union.

The President's request of $1.2 billion for Naval Reactors is an increase of 7.8 percent over the President's FY 2011 Request. The program supports the U.S. Navy's nuclear fleet, comprised of all of the Navy's 72 submarines and 11 aircraft carriers, which constitute 45 percent of the Navy's combatants. The U.S. relies on these ships every day, all over the world, to protect our national interests. The budget provides funding increases for the Ohio Class Replacement submarine to design and develop required submarine reactor plant technologies. R&D is underway now, and funding during this Future Years Nuclear Security Program is critical to support the long manufacturing spans for procurement of reactor plant components in 2017, and ship construction in 2019. Resources are also requested in FY 2012 to support design work for the recapitalization of the spent nuclear fuel handling infrastructure and refueling of the Land-based prototype.

The Office of the Administrator appropriation provides for federal program direction and support for NNSA's Headquarters and field installations. The FY 2012 request is $450.1 million; a 0.4 percent increase over the President's FY 2011 Request. This provides for well-managed, inclusive, responsive, and accountable organization through the strategic management of human capital, enhanced cost-effective utilization of information technology, and integration of budget and performance through transparent financial management practices. The increase reflects additional federal oversight for construction of the Pit Disassembly and Conversion project, the Uranium Processing Facility, and the Chemistry and Metallurgy Research Replacement Facility.

A more detailed summary description of the Department of Energy's FY 2012 budget request follows:

Department of Energy Budget by Organization

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
National Security						
Weapons Activities*	6,386,371	7,008,835	7,008,835	7,629,716	+620,881	+8.9%
Defense Nuclear Nonproliferation*	2,131,382	2,687,167	2,136,709	2,549,492	-137,675	-5.1%
Naval Reactors*	945,133	1,070,486	945,133	1,153,662	+83,176	+7.8%
Office of the Administrator*	410,754	448,267	410,754	450,060	+1,793	+0.4%
Total, National Nuclear Security Administration*	***9,873,640***	***11,214,755***	***10,501,431***	***11,782,930***	***+568,175***	***+5.1%***
Energy and Environment						
Energy Efficiency and Renewable Energy	2,216,392	2,355,473	2,242,500	3,200,053	+983,661	+44.4%
Electricity Delivery and Energy Reliability	168,484	185,930	171,982	237,717	+69,233	+41.1%
Fossil Energy	938,520	760,358	951,133	520,707	-417,813	-44.5%
Nuclear Energy	857,936	912,252	869,995	852,528	-5,408	-0.6%
Total, Energy	***4,181,332***	***4,214,013***	***4,235,610***	***4,811,005***	***+629,673***	***+15.1%***
Environment						
Environmental Management	6,005,894	6,047,000	5,997,854	6,130,071	+124,177	+2.1%
Civilian Radioactive Waste Management	196,800	0	196,800	0	-196,800	-100.0%
Office of Legacy Management	190,802	188,626	190,802	170,100	-20,702	-10.8%
Total, Environment	***6,393,496***	***6,235,626***	***6,385,456***	***6,300,171***	***-93,325***	***-1.5%***
Total, Energy and Environment	***10,574,828***	***10,449,639***	***10,621,066***	***11,111,176***	***+536,348***	***+5.1%***
Science	4,963,887	5,121,437	4,903,710	5,416,114	+452,227	+9.1%
Energy Transformation Acceleration Fund	0	299,966	0	550,011	+550,011	N/A
Corporate Management						
Office of the Secretary	5,864	7,864	5,864	5,030	-834	-14.2%
Cost of Work and Revenues	-72,203	-71,203	-72,203	-63,346	+8,857	+12.3%
Chief Information Officer	103,063	102,163	103,063	85,928	-17,135	-16.6%
Chief Financial Officer	62,981	62,731	62,981	53,204	-9,777	-15.5%
Management	78,456	86,675	78,456	74,585	-3,871	-4.9%
Chief Human Capital Officer	29,537	27,560	29,537	23,089	-6,448	-21.8%
Hearings and Appeals	6,444	6,444	6,444	4,142	-2,302	-35.7%
Congressional and Intergovernmental Affairs	4,826	6,326	4,826	4,690	-136	-2.8%
Public Affairs	4,500	4,500	4,500	3,801	-699	-15.5%
Office of Indian Energy Policy and Programs	5,500	0	5,500	1,500	-4,000	-72.7%
General Counsel	32,478	36,654	32,478	34,642	+2,164	+6.7%
Policy and International Affairs	30,253	30,253	30,253	28,872	-1,381	-4.6%
Economic Impact and Diversity	6,671	6,337	6,671	7,473	+802	+12.0%
Inspector General	51,927	42,850	51,927	41,774	-10,153	-19.6%
Total, Corporate Management	***350,297***	***349,154***	***350,297***	***305,384***	***-44,913***	***-12.8%***
Credit Programs						
Innovative Technology Loan Guarantee Program	0	500,000	-15,000	200,000	+200,000	N/A
Advanced Technology Vehicles Manufacturing Loan	20,000	9,998	20,000	6,000	-14,000	-70.0%
Better Building Pilot Loan Guarantee Initiative For Universities, Schools & Hospitals	0	0	0	105,000	+105,000	N/A
Total, Credit Programs	***20,000***	***509,998***	***5,000***	***311,000***	***+291,000***	***+1,455.0%***
Health, Safety and Security	443,882	464,211	443,882	456,482	+12,600	+2.8%
Energy Information Administration	110,595	128,833	110,595	123,957	+13,362	+12.1%
Power Marketing Administrations	99,477	95,477	99,477	85,080	-14,397	-14.5%
Federal Energy Regulatory Commission	-10,933	-29,111	-28,886	-25,072	-14,139	-129.3%
Domestic Utility Fees	0	-200,000	0	0	0	0
Strategic Petroleum Reserve Sale	0	0	0	-500,000	-500,000	N/A
Cancellation of Prior Year Unobligated Balances	0	0	0	-70,332	-70,332	N/A
Total, Discretionary Funding by Organization **	**26,425,673**	**28,404,359**	**27,006,572**	**29,546,730**	**+3,121,057**	**+11.8%**

NOTE: * FY12 is compared against the FY11 Request. This exception has been implemented for NNSA only.
**The Total, Discretionary Funding, FY12 vs FY10 "$" and "%" columns, reflects a comparison of FY12 Request vs. FY10 Current Approp for all programs including NNSA.

Department of Energy Budget by Appropriation

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Energy And Water Development, And Related Agencies Appropriation Summary						
Energy Programs						
Energy Efficiency and Renewable Energy	2,216,392	2,355,473	2,242,500	3,200,053	+983,661	+44.4%
Electricity Delivery and Energy Reliability	168,484	185,930	171,982	237,717	+69,233	+41.1%
Nuclear Energy	774,578	824,052	786,637	754,028	-20,550	-2.7%
Fossil Energy Programs						
Fossil Energy Research and Development	659,770	586,583	672,383	452,975	-206,795	-31.3%
Naval Petroleum and Oil Shale Reserves	23,627	23,614	23,627	14,909	-8,718	-36.9%
Strategic Petroleum Reserve	243,823	138,861	243,823	121,704	-122,119	-50.1%
Northeast Home Heating Oil Reserve	11,300	11,300	11,300	10,119	-1,181	-10.5%
Northeast Home Heating Oil Reserve Oil Sale	0	0	0	-79,000	-79,000	N/A
Subtotal, Fossil Energy Programs	***938,520***	***760,358***	***951,133***	***520,707***	**-417,813**	***-44.5%***
Uranium Enrichment D&D Fund	573,850	730,498	573,850	504,169	-69,681	-12.1%
Energy Information Administration	110,595	128,833	110,595	123,957	+13,362	+12.1%
Non-Defense Environmental Cleanup	254,673	225,163	244,673	219,121	-35,552	-14.0%
Science	4,963,887	5,121,437	4,903,710	5,416,114	+452,227	+9.1%
Energy Transformation Acceleration Fund	0	299,966	0	550,011	+550,011	N/A
Nuclear Waste Disposal	98,400	0	98,400	0	-98,400	-100.0%
Departmental Administration	168,944	169,132	168,944	128,740	-40,204	-23.8%
Inspector General	51,927	42,850	51,927	41,774	-10,153	-19.6%
Innovative Technology Loan Guarantee Program	0	500,000	-15,000	200,000	+200,000	N/A
Advanced Technology Vehicles Manufacturing Loan	20,000	9,998	20,000	6,000	-14,000	-70.0%
Better Building Pilot Loan Guarantee Initiative For Universities, Schools & Hospitals	0	0	0	105,000	+105,000	N/A
Total, Energy Programs	***10,340,250***	***11,353,690***	***10,309,351***	***12,007,391***	**+1,667,141**	***+16.1%***
Atomic Energy Defense Activities						
National Nuclear Security Administration:						
Weapons Activities*	6,386,371	7,008,835	7,008,835	7,629,716	+620,881	+8.9%
Defense Nuclear Nonproliferation*	2,131,382	2,687,167	2,136,709	2,549,492	-137,675	-5.1%
Naval Reactors*	945,133	1,070,486	945,133	1,153,662	+83,176	+7.8%
Office of the Administrator*	410,754	448,267	410,754	450,060	+1,793	+0.4%
Total, National Nuclear Security Administration*	***9,873,640***	***11,214,755***	***10,501,431***	***11,782,930***	**+568,175**	***+5.1%***
Environmental and Other Defense Activities						
Defense Environmental Cleanup	5,640,371	5,588,039	5,642,331	5,406,781	-233,590	-4.1%
Other Defense Activities	847,468	878,209	847,468	859,952	+12,484	+1.5%
Defense Nuclear Waste Disposal	98,400	0	98,400	0	-98,400	-100.0%
Total, Environmental & Other Defense Activities	***6,586,239***	***6,466,248***	***6,588,199***	***6,266,733***	**-319,506**	***-4.9%***
Total, Atomic Energy Defense Activities	***16,459,879***	***17,681,003***	***17,089,630***	***18,049,663***	**+248,669**	***+1.5%***
Power Marketing Administration						
Southwestern Power Administration	13,076	12,699	13,076	11,892	-1,184	-9.1%
Western Area Power Administration	109,181	105,558	109,181	95,968	-13,213	-12.1%
Falcon & Amistad Operating & Maintenance Fund	220	220	220	220	0	0
Colorado River Basins	-23,000	-23,000	-23,000	-23,000	0	0
Total, Power Marketing Administrations	***99,477***	***95,477***	***99,477***	***85,080***	**-14,397**	***-14.5%***
Subtotal, Energy And Water Development and Related Agencies	***26,899,606***	***29,130,170***	***27,498,458***	***30,142,134***	**+1,901,413**	***+7.1%***
Uranium Enrichment D&D Fund Discretionary Payments	-463,000	-696,700	-463,000	0	+463,000	+100.0%
Excess Fees and Recoveries, FERC	-10,933	-29,111	-28,886	-25,072	-14,139	-129.3%
Strategic Petroleum Reserve Sale	0	0	0	-500,000	-500,000	N/A
Cancellation of Prior Year Unobligated Balances	0	0	0	-70,332	-70,332	N/A
Total, Discretionary Funding by Appropriation **	**26,425,673**	**28,404,359**	**27,006,572**	**29,546,730**	**3,121,057**	**+11.8%**

NOTE: * FY12 is compared against the FY11 Request. This exception has been implemented for NNSA only.
**The Total, Discretionary Funding, FY12 vs FY10 "$" and "%" columns, reflects a comparison of FY12 Request vs. FY10 Current Approp for all programs including NNSA.

Science

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Advanced Scientific Computing Research	383,199	0	465,600	+82,401	+21.5%
Basic Energy Sciences	1,598,968	0	1,985,000	+386,032	+24.1%
Biological and Environmental Research	588,031	0	717,900	+129,869	+22.1%
Fusion Energy Sciences Program	417,650	0	399,700	-17,950	-4.3%
High Energy Physics	790,811	0	797,200	+6,389	+0.8%
Nuclear Physics	522,460	0	605,300	+82,840	+15.9%
Workforce Development for Teachers and Scientist	20,678	0	35,600	+14,922	+72.2%
Science Laboratories Infrastructure	127,600	0	111,800	-15,800	-12.4%
Safeguards and Security	83,000	0	83,900	+900	+1.1%
Science Program Direction	189,377	0	216,863	+27,486	+14.5%
Congressionally Directed Projects	74,737	0	0	-74,737	-100.0%
Small Business Innovation Research (SBIR)	167,529	0	0	-167,529	-100.0%
Subtotal, Science	***4,964,040***	***4,903,710***	***5,418,863***	***+454,823***	***+9.2%***
Adjustments	-153	0	-2,749	-2,596	-1,696.7%
Total, Office Of Science	**4,963,887**	**4,903,710**	**5,416,114**	**+452,227**	**+9.1%**

PROGRAM DESCRIPTION

The mission of the **Office of Science (SC)** is the delivery of scientific discoveries and major scientific user facilities and tools to transform our understanding of nature and to advance the energy, economic, and national security of the United States. The Science program supports basic research in the following areas: fundamental research in energy, matter, and the basic forces of nature; biological systems; climate change and the environmental consequences of energy production, development, and use; fundamental science that supports the foundations for new energy technologies and environmental mitigation; a knowledge base for fusion as a potential future energy source; and advanced computational and networking tools critical to research.

The total budget request for the Office of Science is $5.4 billion in FY 2012. In support of its mission, SC's responsibilities are in three main areas: selection and management of research; operation of world-class, state-of-the-art scientific facilities; and design and construction of new facilities. SC activities are carried out in ten programs: Advanced Scientific Computing Research (ASCR), Basic Energy Sciences (BES), Biological and Environmental Research (BER), Fusion Energy Sciences (FES), High Energy Physics (HEP), Nuclear Physics (NP), Workforce Development for Teachers and Scientists (WDTS), Science Laboratories Infrastructure (SLI), Safeguards and Security (S&S), and Science Program Direction (SCPD).

PROGRAM HIGHLIGHTS

Advanced Scientific Computing Research (ASCR) supports research to discover, develop, and deploy the computational and networking capabilities to analyze, model, simulate, and predict complex phenomena important to DOE. Scientific computing is particularly important for the solution of energy and environment research problems that are not solvable through traditional theoretical and experimental approaches or are too hazardous, time-consuming, or expensive to solve by traditional means. A particular challenge of the ASCR program is fulfilling the science

potential of emerging computing systems and other novel computing architectures, which will require numerous significant modifications to today's tools and techniques to deliver on the promise of exascale science. The architecture of future computing systems, from desktops to exascale, will be transformed by changes in the underlying semiconductor technology and will be constrained by the need for greater energy efficiency. ASCR supports research in applied mathematics, computer science, advanced networking, and computational partnerships (Scientific Discovery through Advanced Computing, or SciDAC), as well as research and evaluation prototypes, and the operation of high performance computing systems and networks. In FY 2012, ASCR will make balanced investments, driven by science needs, in high performance computing facilities, advanced networks, and research and evaluation prototypes with investments in applied mathematics, computer science, next generation networks for science, and computational partnerships to address the challenges introduced by the disruptive changes in the computing industry. The FY 2012 request includes funds in the research and evaluations prototypes activity to explore architectures on the path toward exascale computing and pursue multiple paths to overcoming key barriers. These efforts will be closely coordinated with NNSA investments to ensure complementary and efficient use of resources. In FY 2012, ASCR will complete the planned recompetition of SciDAC by initiating computational partnerships throughout the SciDAC science domain and will augment ASCR co-design activities to prepare critical DOE applications for exascale systems. The FY 2012 request supports continued operations of the Leadership Computing Facilities at Oak Ridge National Laboratory and Argonne National Laboratory, which provide petascale computing power to the open science community. The Oak Ridge Leadership Computing Facility operates a 2.33 petaflops system and in FY 2012 will continue site preparation and acquisition activities for the next generation of machine which will be a 5-10 times more capable than their current system. The Argonne Leadership Computing Facility operates a 556 teraflop system and in FY 2012 will support the acquisition, installation and testing of 10 petaflop IBM Blue Gene/Q, developed through a joint partnership with IBM, NNSA, and ASCR's research and evaluation prototype activity. The National Energy Research Scientific Computing (NERSC) facility at Lawrence Berkeley National Laboratory will operate high-end systems with an aggregate capability of 1 petaflop. ESnet will continue to advance the next generation of network capability, critical to DOE applications and facilities, and begin to deliver 100 gigabit per second (Gbps) connections among the Office of Science laboratories, up from 40-60 Gbps in FY 2009.

Basic Energy Sciences supports fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic, and molecular levels in order to provide the foundations for new energy technologies and to support DOE missions in energy, environment, and national security. BES-supported research disciplines—condensed matter and materials physics, chemistry, geosciences, and aspects of physical biosciences—provide the knowledge base for the control of the physical and chemical transformations of materials and the discovery and design of new materials with novel structures, functions, and properties. These disciplines drive new solutions and technologies in virtually every aspect of energy resources, production, conversion, transmission, storage, efficiency, and waste mitigation. In FY 2012, the BES program will support expanded efforts in basic research for transformational energy applications with an emphasis on addressing fundamental knowledge gaps that directly impact the performance limitations, cost, and reliability of clean energy technologies. The new efforts complement the Energy Frontier Research Centers, which are focused on the pursuits of broad science challenges for energy. Two Energy Innovation Hubs are supported in FY 2012 by BES, part of the set of Hubs initiated by DOE in FY 2010. The DOE Hubs assemble multidisciplinary teams from universities, national laboratories, and the private sector to address systemic energy challenges, and will result in new materials, systems, and knowledge critical to developing a robust industrial base leading the next generation of energy technology. The two BES Hubs will focus on Fuels from Sunlight and on Batteries and Energy Storage. BES also plans, designs, constructs, and operates scientific user facilities that use x-ray, neutron, and electron beam scattering techniques to probe the most fundamental electronic and atomic properties of materials at the limits of time, space, and energy resolution. The world-class scientific user facilities supported by BES provide important capabilities for fabricating, characterizing, and transforming materials of all kinds from metals, alloys, and ceramics to fragile bio-inspired and biological materials. BES continues support for the operations of its suite of scientific user facilities and construction of the National Synchrotron Light Source II. In FY 2012, increases are requested to upgrade the Advanced Photon Source, expand capabilities at the Linac Coherent Light Source, and enhance instrumentation at existing light sources, neutron sources, and the nanoscale science research centers. These efforts aim at ensuring these world-class scientific tools stay at the technological forefront and continue to charter new paths for scientific pursuits.

Biological and Environmental Research supports research to explore the frontiers of genome-enabled biology; discover the physical, chemical, and biological drivers of climate change; and seek the molecular determinants of environmental sustainability and stewardship. BER-supported systems biology research uncovers nature's secrets from the diversity of microbes and plants to understand how biological systems work, how they interact with each other, and how they can be manipulated to harness their processes and products that contribute to new strategies for

producing new biofuels, cleaning up legacy waste, and sequestering carbon dioxide. BER plays a vital role in supporting research on atmospheric processes, climate modeling, interactions between ecosystems and greenhouse gases, and analysis of impacts of climatic change on energy production and use. Subsurface biogeochemistry research seeks to understand the role that subsurface biogeochemical processes play in determining the fate and transport of contaminants including heavy metals and radionuclides. In FY 2012, new BER foundational research will accelerate the development of new clean energy solutions that identify and articulate general biological design principles, allowing researchers to understand the fundamental genetic and physical rules that make biological components and multi-component systems (from cells to organisms to ecosystems) perform reliably under widely varying conditions. The knowledge of these design principles or rules will then serve as the foundation for subsequent redesign to optimize for function under different conditions that can lead to sustainable clean energy. The research will include the development of new synthetic molecular toolkits and test beds for understanding natural systems and computer-aided design. BER expands climate observations to understand the role of clouds and aerosols in climate; research to define the noise in the currently observed global carbon system, given the spatial and temporal variability due to both anthropogenic and natural carbon emissions; and research to accelerate the resolution of critical uncertainties involved in the prediction of climate change and to increase the accuracy of projections. BER will also continue research in systems biology, radiochemistry, climate simulations and analyses needed for part of the Intergovernmental Panel on Climate Change Fifth Assessment, and subsurface biogeochemistry. Support is provided for the three DOE Bioenergy Research Centers started in FY 2007, the Joint Genome Institute, and operation of the Environmental Molecular Sciences Laboratory.

Fusion Energy Sciences supports research to expand the fundamental understanding of matter at very high temperatures and densities and the scientific foundations needed to develop a fusion energy source. This is accomplished by studying plasmas under a wide range of temperature and density, developing advanced diagnostics to make detailed measurements of their properties, and creating theoretical/computational models to resolve the essential physics. FES operates scientific user facilities to enable world-leading research programs in high-temperature, magnetically confined plasmas, and to participate in the design and construction of ITER, the world's first facility for studying a sustained burning plasma. FES also supports enabling R&D to improve the components and systems that are used to build fusion facilities. The FY 2012 budget request funds the U.S Contributions to ITER project, including research and development of key components, long-lead procurements, personnel, and cash contribution to the ITER Organization. Research at the major experimental facilities in the FES program—the DIII-D tokamak, the Alcator C-Mod tokamak, and the National Spherical Torus Experiment (NSTX)—will continue to focus on providing solutions to key high-priority ITER issues and build a firm physics basis for ITER design and operation. Research to deepen the understanding needed to field materials that must endure the harsh fusion environment is also supported in this request. The FY 2012 request will continue support of advanced computational simulation of fusion plasmas and the research at three plasma science centers. FES also continues to support the joint program in high energy density laboratory plasmas (HEDLP) with the National Nuclear Security Administration. Research in other areas of discovery science is also supported in programs executed jointly with the National Science Foundation.

High Energy Physics supports research to understand how our universe works at its most fundamental level. This is accomplished by discovering the most elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time itself. HEP is focused on three scientific frontiers in particle physics: the Energy Frontier, the Intensity Frontier, and the Cosmic Frontier. Research includes theoretical and experimental studies by individual investigators and large collaborative teams—some who gather and analyze data from accelerator facilities in the U.S. and around the world and others who develop and deploy ultra-sensitive ground- and space-based instruments to detect particles from space and observe astrophysical phenomena that advance our understanding of fundamental particle properties. HEP also invents new particle accelerator and detector technologies to meet the challenges of research at the frontiers. The Tevatron Collider at Fermi National Accelerator Laboratory (Fermilab) completes operations by FY 2012. Its record-breaking performance over the last few years means it remains competitive with the Large Hadron Collider (LHC) in Geneva, Switzerland, for significant discoveries. The Fermilab accelerator complex will operate for part of FY 2012 to support the neutrino program and then shut down to install planned upgrades to the neutrino beam lines. Support for LHC detector operations, maintenance, computing, and R&D continues in FY 2012 in order to maintain a U.S. leadership role in the LHC program. Construction continues for the NuMI Off-Axis Neutrino Appearance (NOvA) project to enable key measurements of neutrino properties. Project engineering and design is supported for the Long Baseline Neutrino Experiment (LBNE) and the Muon to Electron (Mu2e) experiment. Several national and international collaborative projects to pursue questions in dark matter, dark energy, and neutrino properties continue in FY 2011, including the Dark Energy Survey experiment in Chile; the Reactor Neutrino Detector in Daya Bay, China; and R&D for the Large Synoptic Survey Telescope. HEP also continues support for advanced accelerator and detector R&D, including development of superconducting radio frequency technology applicable to a variety of future accelerator projects.

Nuclear Physics supports research to discover, explore, and understand all forms of nuclear matter. The fundamental particles that compose nuclear matter, quarks, and gluons are relatively well understood, but exactly how they fit together and interact to create different types of matter in the universe is still largely not understood. To accomplish this, NP supports experimental and theoretical research—along with the development and operation of particle accelerators and advanced technologies—to create, detect, and describe the different forms and complexities of nuclear matter that can exist in the universe, including those that are no longer found naturally. NP also provides stewardship of isotope production and technologies to advance important applications, research, and tools for the nation. By providing support for tools, facilities, and research opportunities, the NP program challenges the imagination and the scientific and technical abilities of U.S. scientists and the international scientific community. The FY 2012 request continues support for the two highest priorities in the 2007 Long Range Plan for Nuclear Science: an energy upgrade of the Continuous Electron Beam Accelerator Facility (CEBAF) and construction of the Facility for Rare Isotope Beams. These investments in forefront facilities for new research capability, the first in the NP program in over ten years, will secure global U.S. leadership in research on the quark structure of nucleons, nuclear structure, and nuclear astrophysics. The increases required for these two high priority projects have required strategic decisions elsewhere in the program, most notably the closure of the Holifield Radioactive Ion Beam Facility (HRIBF) in FY 2012. The request continues to support operations at NP's other scientific user facilities: the Continuous Electron Beam Accelerator Facility (CEBAF), the Relativistic Heavy Ion Collider (RHIC), and the Argonne Tandem Linac Accelerator System (ATLAS). Overall, the FY 2012 request supports core nuclear physics research at over 90 academic institutions and 9 of the DOE national laboratories.

Workforce Development for Teachers and Scientists includes increases for the DOE Office of Science Graduate Fellowship program to support an estimated total of 320 students who will pursue advanced science and engineering degrees in fields of basic research relevant to the Office of Science mission areas, including two continuing cohorts first funded in FY 2010 and FY 2011, and a new cohort starting in FY 2012. The **Science Laboratories Infrastructure** program supports infrastructure at DOE laboratories and landlord responsibilities at the Oak Ridge Reservation, and provides Payments in Lieu of Taxes to local communities around the Argonne, Brookhaven, and Oak Ridge National Laboratories. Construction funding supports one new project and continues five prior year projects. The **Safeguards and Security** program continues to address the highest security needs of the SC complex. Finally, **Science Program Direction** requests additional funding to support total staffing of 1,095 FTEs at headquarters, field sites, and the Office of Scientific and Technical Information.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Advanced Scientific Computing Research (FY 2010 $383.2; FY 2012 $465.6) .....+$82.4
Increased funding in Applied Mathematics supports the development of improved applied mathematical models, methods, and algorithms ($49.0; +$5.3). Computer Science also increases to support the challenges of emerging extreme scale architectures ($47.4; +$1.5). Computational Partnerships will support efforts on getting applications ready for extreme scale computing ($60.0; +$10.5). Next Generation Networking for Science decreases to reflect the phase-out for the Open Science Grid ($12.8; -$1.6). Support for NERSC operations is increased ($57.8; +$2.9) while support for the Leadership Computing Facilities at ORNL and ANL is increased to cover scheduled increases in lease payments ($156.0; +$27.2). Support for Research and Evaluation Prototypes increases to support new exascale relevant prototypes ($35.8;+$19.8). Support for ESnet increases to begin to deliver increased bandwidth ($34.5; +$4.5). SBIR/STTR increases ($12.3; +$12.3).

Basic Energy Sciences (FY 2010 $1,599.0; FY 2012 $1,985.0) ..... +$386.0
Materials Sciences and Engineering research ($464.1) increases to initiate a new Energy Innovation Hub focused on Batteries and Energy Storage ($34.0; +$34.0). Experimental Condensed Matter Physics ($58.6; +$12.0), Theoretical Condensed Matter Physics ($47.2; +$17.5), Mechanical Behavior and Radiation Effects ($32.5; +$15.0), Physical Behavior of Materials ($46.0; +$17.5) are increased. Support for the EPSCoR program decreases because of additional funding provided in the FY 2010 appropriation ($8.5; -$13.1). Other activities are increased ($224.7; +$15.2). SBIR/STTR is increased ($12.5; +$12.5) ..... +$110.6

Chemical Sciences, Geosciences, and Biosciences ($398.8) increases to support an Energy Innovation Hub focused on Fuels from Sunlight ($24.3; +$24.3). Chemical Physics Research ($66.5; +$15.0), Solar Photochemistry ($52.7; +$12.5), Catalysis Science ($53.8; +$9.0), Separations and Analysis ($22.8; +$8.5), Heavy Element Chemistry ($23.4; +$11.2), and Geosciences ($43.0; +$19.3) are increased. Other activities are increased ($101.7; +$1.0). SBIR/STTR is increased ($10.6; +$10.6)..... +$111.3

Scientific User Facilities ($970.7) initiates NSLS-II Experimental Tools MIE ($12.0; +$12.0), APS Upgrade MIE ($20.0; +$20.0), LCLS-II MIE ($30.0; +$30.0), and TEAM II MIE ($15.0, +$15.0). Funding is continued per schedule for the SNS power upgrade ($5.5; +$3.5). Increase the Synchrotron Radiation Light Sources ($426.9; +$54.9), Neutron Scattering Facilities ($276.7; +$18.8), and the Nanoscale Science Research Centers ($116.6; +$11.5). Other activities are decreased ($46.3; -$20.5). SBIR/STTR is increased ($21.7; +$21.7) ..... …… +$166.9

Construction ($151.4) funding increases as construction of the National Synchrotron Light Source II ramps up ($151.4; +$12.4). Final funding for construction of the Linac Coherent Light Source was provided in FY 2010 per schedule ($0.0; -$15.2) ..... -$2.8

Biological and Environmental Research (FY 2010 $588.0; FY 2012 $717.9) .....+$129.9
Biological Systems Science research ($376.3) includes increases in Genomic Science in the areas of foundational genomics and computational biosciences ($241.5; +$75.9). Funding is decreased for Radiological Sciences ($34.3;

-$12.4). Ethical, Legal, and Societal Issues is discontinued as these activities will be addressed within relevant programmatic areas ($0.0; -$5.0). Medical Applications research decreases with completion of the Artificial Retina effort ($0.0; -$8.2). The Joint Genome Institute and Structural Biology Infrastructure funding is increased ($90.2; +$5.9). SBIR/STTR increases ($10.3; +$10.3) ..... +$66.5

Climate and Environmental Sciences ($341.6) support continues for Atmospheric System Research for next generation 3-D cloud parameterizations ($26.4). Environmental System Science is increased ($101.2; +$18.1). Climate and Earth System Modeling funding increases for uncertainty quantification in climate models, incorporation of observational data sets, model development testbeds, and the development of numerical methods to enable climate models to use future computing architectures ($77.3;+$8.2). Climate and Environmental Facilities and Infrastructure provides increased support for the ARM Climate Research Facility ($128.2; +$28.4). SBIR/STTR increases ($8.6; +$8.6)... ..... +$63.4

Fusion Energy Sciences (FY 2010 $417.7 FY 2012 $399.7) ..... -$18.0
Funding for the international ITER project decreases consistent with the Administration's assessment of the current project status ($105.0; -$30.0). Facility Operations increase for: DIII-D for personnel and electrical power costs and Alcator C-Mod for additional run time ($57.8; +$2.5); NSTX Upgrade MIE ($14.6; +$5.7); and offset by a decrease in NSTX Facility Operations ($17.5; -$3.8) due to a shutdown for the NSTX Upgrade MIE. Science activities increase ($177.8; +$8.8): Tokamak Experimental Research for DIII-D, Alcator C-Mod, International, and education activities; General Plasma Science to initiate a Joint Center for Plasma Research and fund fully Plasma Science Centers initiated with Recovery Act funding; SBIR/STTR for continuation at the mandated levels. Offsets within Science activities include decreases in Alternative Concept Experimental Research reflecting a shift to a re-directed program and in Advanced Fusion Simulations to allow for FES evaluation of the planning phase of the Fusion Simulation Program. Other areas, including Enabling R&D have minor adjustments ($27.0; -$1.1).

High Energy Physics (FY 2010 $790.8; FY 2012 $797.2) .....+$6.4
In Proton Accelerator-Based Physics ($412.7), Proton Complex Operations and Support decrease reflecting that the Tevatron Collider operations will have been completed ($115.8; -$23.1). Proton Accelerator Facility Projects decrease consistent with project profiles with an increase for expanded activities on pre-conceptual R&D in support of the future Intensity Frontier program ($76.7; -$9.9). Also, Large Hadron Collider Support decreases primarily for the LHC accelerator upgrade project; detector support activities are maintained at the FY 2010 level-of-effort ($72.8; -$6.8). Other Facilities increase primarily to maintain options for the Long Baseline Neutrino Experiment far detector ($19.7; +$12.1). Research activities increase to support LHC research with some reductions in Tevatron collider research ($127.7; +$2.0).

In Electron Accelerator-Based Physics ($22.3), experimental research is reduced ($13.1; -$2.2) and funding decreases according to the planned profile for safe dismantling and decommissioning of the BaBar detector and putting PEP II into a minimum maintenance configuration ($9.3; -$5.7).

In Non-Accelerator Physics ($81.9), funding decreases for the Reactor Neutrino Detector, Dark Energy Survey and Super Cryogenic Dark Matter Search consistent with planned project profiles, with an increase to initiate the High Altitude Water Cherenkov detector and future projects R&D ($14.0; -$16.8). Grant and National Laboratory Research funding is increased to support pre-operations, operations, and commissioning for projects, partially offset with reduced funding for core research activities ($67.9; +1.2).

The Theoretical Physics program is held flat with FY 2010 funding ($68.9; +$0.5).

In Advanced Technology Research and Development ($171.9), Accelerator Science is increased to support the new FACET and BELLA facilities ($54.1; +$11.7); SBIR/STTR increases for continuation at the mandated levels ($19.2; +$19.2); small increase in Other Technology R&D ($25.5; +$0.3); and decrease in Accelerator Development primarily for superconducting RF and International Linear Collider R&D ($73.1; -$15.6).

Funding to provide for project engineering and design activities for the Long Baseline Neutrino Experiment ($17.0; +$17.0) and the Muon to Electron Conversion Experiment ($22.5; +$22.5).

Nuclear Physics (FY 2010 $522.5; FY 2012 $605.3)..... +$82.8
SBIR/STTR accounts for $12.8 of the $82.8 increase since funding is transferred out of NP in FY 2010 and included in FY 2012. The remaining increase of $70.0 is dominated by an increase of $64.0 in the planned profiles for two forefront facilities for new research capability: the 12 GeV CEBAF Upgrade Project ($66.0; +$46.0 within Construction) and the Facility for Rare Isotope Beams (FRIB) ($30.0; +$18.0 within the Low Energy subprogram). These increases required strategic decisions in the rest of the program, most notably the closure of the ORNL HRIBF national user facility ($6.8; -$10.3 within the Low Energy subprogram). The Medium Energy subprogram holds research flat with the exception of increases focused on building the research program for the new experimental Hall that is part of the 12 GeV CEBAF Upgrade ($130.4; +$2.8 excluding SBIR/STTR). The Heavy Ion subprogram holds research flat with the exception of increases for U.S. participation at the LHC and funding for the planned profile for the STAR HFT MIE; funding for RHIC operations increases to support the planned research program ($220.0; +$9.2 excluding SBIR/STTR). The Low Energy subprogram, excluding FRIB and HRIBF (mentioned above) holds research flat with the exception of efforts associated with the operations of newly completed MIEs, the planned profile for neutrinoless double beta decay research which is aligned with competing international efforts, and funding to maintain options for the Long Baseline Neutrino Experiment far detector ($89.7; +$1.2 excluding SBIR/STTR). The Nuclear Theory subprogram includes funding for the planned profile for the LQCD initiative with HEP and a redistribution of funds for the Applications of Nuclear Science and Technology initiative to the Nuclear Data program ($42.2; +$2.2). Support for the Isotope Development and Production for Research and Applications program ($20.2; +$0.9) is maintained at a constant level of effort.

Workforce Development for Teachers and Scientists (FY 2010 $20.7; FY 2012 $35.6)..... +$14.9
Funding increases for the DOE Office of Science Graduate Fellowships program to support three cohorts (including cohorts first funded in FY 2010 and FY 2011, if any) of an estimated 320 students ($16.1; +$11.1). Increased funding is also provided for core WDTS programs that the 2010 COV found exemplary (SULI, CCI, Einstein Fellows, and National Science Bowl®). Consistent with the COV recommendations, WDTS will discontinue three programs in FY 2012: DOE Academies Creating Teacher Scientists, Pre-Service Teachers, and High School Engineering.

Science Laboratories Infrastructure (FY 2010 $127.6; FY 2012 $111.8)..... -$15.8
Infrastructure Support ($6.9; +$0.3) continues support for Oak Ridge Landlord and Payments in Lieu of Taxes. Construction funding ($104.9) decreases to support one new FY 2012 project, the Science and User Support Building at SLAC ($12.1; +$12.1), which is part of the SC Infrastructure Modernization Initiative. Funding is continued for five prior year projects ($92.8; -$28.2).

Safeguards and Security (FY 2010 $83.0; FY 2012 $83.9) ..... +$0.9
Funding increases to provide a constant level of effort for safeguards and security activities and to support security investigations for federal field employees.

Science Program Direction (FY 2010 $189.4; FY 2012 $216.9)..... +$27.5
Funding for salaries and benefits for headquarters and field staffing, including support for 65 additional FTEs over FY 2010 actual usage for total FY 2012 staffing of 1,095 FTEs ($158.5; +$13.9); support of staff and advisory committee travel ($4.6; +$0.9); support services ($23.5; +$6.2); and other related expenses ($30.3; +$6.6) including office space, communications, and utilities.

Advanced Research Projects Agency – Energy

(dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Advanced Research Projects Agency - Energy (ARPA-E)					
Energy Transformation Acceleration Fund					
ARPA-E Projects	0	0	521,943	+521,943	N/A
Program Direction	0	0	28,068	+28,068	N/A
Subtotal, Energy Transformation Acceleration Fund	***0***	***0***	***550,011***	***+550,011***	***N/A***
Wireless innovation fund	0	0	100,000	+100,000	N/A
Total, Advanced Research Projects Agency - Energy (ARPA-E)	**0**	**0**	**650,011**	**+650,011**	**N/A**

PROGRAM DESCRIPTION

The **Advanced Research Projects Agency – Energy (ARPA-E)** is devoted exclusively to funding specific high-risk, high payoff, game-changing research and development projects to meet the nation's long-term energy challenges. In 2005, a bipartisan group of Members of Congress requested that the National Academies "identify the most urgent challenges the United States faces in maintaining leadership in key areas of science and technology."[1] In response, the National Academies authored a report entitled *Rising Above the Gathering Storm* in which were expressed grave concerns about the state of U.S. economic and technological competitiveness. Among the many recommendations in the *Gathering Storm* report that were enacted into law was the creation of ARPA-E.

Initially funded in FY 2009, ARPA-E is at the forefront of the Department of Energy's efforts to accelerate the pace of innovation. ARPA-E fulfills a critical need for transformational energy technologies. Given the recent surge in energy investments overseas, the next few decades must be the most innovative period of U.S. history in order to remain competitive in the clean energy economy of the future. ARPA-E will play a key role in fostering that innovation. The magnitude of this challenge is enormous, as is the opportunity. To meet this challenge, the Director of ARPA-E will administer funds to projects that promise a high impact on the ARPA-E mission and will create new and game-changing global business opportunities.

ARPA-E is a priority for the administration. ARPA-E was created to be a catalyst for innovation. ARPA-E's objective is to tap into the risk-taking American ethos and to identify and support the pioneers of the future. With the best research and development infrastructure in the world, a thriving innovation ecosystem in business and entrepreneurship, and a generation of youth that is willing to engage with fearless intensity, the U.S. has all the ingredients necessary for future success. The goal of ARPA-E is to harness these ingredients and make a full-court press to address the U.S.'s technological gaps and leapfrog over current energy approaches.

In accordance with ARPA-E's statute, the agency will focus on overcoming long-term and high-risk technological barriers in the development of energy technologies. These technologies are those that are too risky for the private sector to invest in, but if overcome they will address the statutory goals: (i) to reduce foreign imports of energy; (ii) to increase energy efficiency across all economic sectors; (iii) to reducing emissions; and (iv) to ensure US technological lead in developing and deploying advanced technologies.

[1] National Research Council, Committee on Prospering in the Global Economy of the 21st Century, *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future* (2007), page 244.

The FY 2012 budget request of $550 million provides funding for Projects that support the mission of ARPA-E and Program Direction that supports these projects. An additional $100 million in mandatory funding is proposed from the Wireless Innovation Fund for developing cutting-edge wireless technologies.

PROGRAM HIGHLIGHTS

Creating the Competition

ARPA-E identifies and promotes early-stage transformational research and development projects in areas that industry by itself cannot and will not support because of technical and financial uncertainty. ARPA-E focuses on those technologies that do not exist in the market today, but if they did they would make today's technologies obsolete and have large commercial impact. The goal is to create those next generation technologies that are inexpensive and market competitive (see examples below). ARPA-E's approach is to set bold performance and economic targets, and let innovators compete through multiple technological approaches to meet those targets. Many may fail in this process, but some may succeed. In short, ARPA-E creates the competition, and then lets entrepreneurs pick those that make business sense and create new businesses based on those technologies.

ARPA-E Program Directors are world-class scientists and term-limited

ARPA-E has statutory provisions to hire professionals with exceptions to civil service laws with term limits of 3-4 years. These two provisions are key and have allowed ARPA-E to quickly recruit highly talented people—the best and the brightest—who would not have otherwise served in the federal government. These are technologists and entrepreneurs from the industry and academia, who are highly respected in their field of expertise, and who will now serve the nation through ARPA-E. The term limit has created a sense of urgency to make a positive impact before they leave, and this has also led to a highly efficient process.

Efficiency of Operation

ARPA-E is a small, flat, and nimble agency that has shown unprecedented speed, agility, and efficiency in creating new programs with a sense of "fierce urgency" that is necessary to make the U.S. globally competitive in the energy sector. It has demonstrated that within a span of 6-8 months, it can organize a technical workshop, create and announce a Funding Opportunity Announcement (FOA), conduct a transparent and thorough proposal review process via a panel of experts, undergo an expedited contracting process, and finally obligate funds. A recent report by the President's Council of Advisors on Science and Technology highlighted the innovations in the ARPA-E process as a model for a government agency. We plan to further fine-tune and use this process in the future.

DOE Coordination

ARPA-E takes great care in not duplicating science and technologies that are already being pursued within other parts of the Department. This is achieved through extensive coordination within DOE to identify gaps and "white spaces." Instead, ARPA-E focuses on those out-of-the-box and high-risk ideas that are unlikely to find support within DOE or in the private sector, but if successful, would make today's approaches obsolete and have large commercial impact in the future.

Currently Funded Projects

Beginning in April 2009, ARPA-E issued seven Funding Opportunity Announcements (FOAs) and received an overwhelming response from the technical community. To date, ARPA-E has reviewed 4,786 concept papers and 688 full proposals, from which 121 projects were selected.

ARPA-E's first FOA did not seek a specific technological goal; rather, these projects were selected based on the impact on ARPA-E's mission, innovative technical approaches, performance teams, opportunities for the U.S. to gain leadership, and to pursue technologies that are underserved by other parts of DOE and the private sector.

ARPA-E's subsequent FOAs targeted specific end technologies, in contrast to the open approach of the initial funding opportunity. These programs fund competitive approaches, setting market-relevant and aggressive cost and performance metrics for performers to achieve regardless of specific technologies. The specific programs are:

- Electrofuels
- Batteries for Electrical Energy Storage in Transportation (BEEST)
- Building Energy Efficiency Through Innovative Thermodevices (BEET IT)
- Agile Delivery of Electrical Power Technology (ADEPT)
- Innovative Materials and Processes for Carbon Capture Technologies (IMPACCT)

- Grid-Scale Rampable Intermittent Dispatchable Storage (GRIDS)

Potential Future Programs

In FY 2012, ARPA-E requests $521.9 million to fund new programs in the following areas:

- Stationary Power ($130 million);
- Electrical Infrastructure ($80 million);
- End Use Efficiency ($105 million);
- Embedded Efficiency ($60 million);
- Transportation Systems ($115 million);
- Seedlings/Broad Funding Announcement ($17.3 million); and
- Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR; $9 million).

Except for the Seedlings/Broad Funding Announcement and SBIR/STTR, programs will fund competitive approaches toward a specific end goal with measurable technical milestones and deliverables. ARPA-E will reserve additional funds for Seedlings/Broad Funding Announcement to capture potentially disruptive energy technologies that may fall outside the scope of ARPA-E's defined programs.

In addition, ARPA-E will participate in the Wireless Innovation and Infrastructure, which proposes to reallocate a total of 500 megahertz of Federal agency and commercial spectrum bands in order to increase Americans access to wireless broadband. Repurposing spectrum will greatly facilitate access for smart phones, portable computers, and innovative technologies that are on the horizon. This effort will also enhance Americas public safety, infrastructure, and competitiveness by investing some of the expected auction receipts in the creation of a broadband network for public safety, expanding access to wireless broadband in rural America, and a Wireless Innovation (WIN) Fund to help develop cutting edge wireless technologies. As part of this initiative, ARPA-E will participate in the WIN Fund by supporting clean energy activities.

ARPA-E programs generally fall into two categories:

- New Areas of Science and Technology—for example, ARPA-E's current Electrofuels program the goal of which is to create a biological non-photosynthetic process to produce liquid fuels. This is not being done anywhere else and, if successful, could create an entirely new industry.

- New Generation Technology—for example, ARPA-E's current program called Batteries for Electrical Energy Storage in Transportation, or BEEST. While DOE and most outside R&D is focused on lithium batteries, ARPA-E is looking for other battery chemistries that, if successful, would yield batteries that are less expensive and provide longer range and storage capabilities than today's approaches.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

ARPA-E Projects (FY 2010 $0.0; FY 2012 $521.9).....+$521.9
ARPA-E plans to increase the number of programs in two broad areas: New Areas of Science and Technology and New Generation Technology. Programs will be funded in these areas of focus: Stationary Power, Electrical Infrastructure, End Use Efficiency, Embedded Efficiency, and Transportation Systems.

ARPA-E Program Direction (FY 2010 $0.0; FY 2012 $28.1).....+$28.1
In FY 2012, the Program Direction element of ARPA-E's request will accommodate the hiring of federal employees and support service contractors, with commensurate increases in information technology purchases and costs for leased space, to allow ARPA-E to fulfill the mission of the program.

Wireless Innovation Fund (FY 2010 $0.0M; FY 2012 $100.0M).....+$100.0
An additional $100 million in mandatory funding is proposed from the Wireless Innovation Fund for developing cutting-edge wireless technologies.

Energy Efficiency and Renewable Energy

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Hydrogen Technology	170,297	0	0	-170,297	-100.0%
Hydrogen and Fuel Cell Technologies	0	0	100,450	+100,450	N/A
Biomass and Biorefinery Systems RD&D	216,225	0	340,500	+124,275	+57.5%
Solar Energy	243,396	0	457,000	+213,604	+87.8%
Wind Energy	79,011	0	126,859	+47,848	+60.6%
Geothermal Technology	43,120	0	101,535	+58,415	+135.5%
Water Power	48,669	0	38,500	-10,169	-20.9%
Vehicle Technologies	304,223	0	588,003	+283,780	+93.3%
Building Technologies	219,046	0	470,700	+251,654	+114.9%
Industrial Technologies	94,270	0	319,784	+225,514	+239.2%
Federal Energy Management Program	32,000	0	33,072	+1,072	+3.4%
Facilities and Infrastructure	19,000	0	26,407	+7,407	+39.0%
Program Direction	140,000	0	176,605	+36,605	+26.1%
Program Support	45,000	0	0	-45,000	-100.0%
Strategic Programs	0	0	53,204	+53,204	N/A
Weatherization and Intergovernmental	270,000	0	393,798	+123,798	+45.9%
Congressionally Directed Projects	292,135	0	0	-292,135	-100.0%
Subtotal, Energy Efficiency and Renewable Energy	***2,216,392***	***2,242,500***	***3,226,417***	***+1,010,025***	***+45.6%***
Adjustments	0	0	-26,364	-26,364	N/A
Total, Energy Efficiency And Renewable Energy	**2,216,392**	**2,242,500**	**3,200,053**	**+983,661**	**+44.4%**

The **Office of Energy Efficiency and Renewable Energy (EERE)** supports research, development, demonstration, and deployment activities on technologies and practices essential for meeting national security goals by reducing dependence on oil, meeting environmental goals by minimizing the emissions associated with energy production and use, and stimulating economic growth and job creation by minimizing the cost of energy services and stimulating investment and job creation in US businesses. The EERE portfolio emphasizes work areas where the potential impact is largest, where federal funds are most critical. It balances investments in high-risk research with partnerships with private firms that speed the translation of innovations into practical business opportunities. The diverse set of technologies supported helps ensure that the US has many options for meeting its energy goals. Program management is designed to identify the best groups in the country to address these challenges and supports work in universities, companies, national laboratories, and consortia.

PROGRAM DESCRIPTION

EERE's individual program activities promote the specific development and use of sector-based clean, reliable, and cost-effective technologies through two key sectors: energy efficiency and renewable energy. The increased productivity from efficiency gains and the generation of power from renewable energy sources can help meet growing national energy needs, reduce dependence on oil, and enhance energy and environmental security. The FY 2012 budget request is $3.2 billion, an increase of $983.7 million, or approximately 44.4 percent above the FY 2010 current appropriation.

The **Hydrogen and Fuel Cell Technologies** program maintains a balanced portfolio of activities that address a variety of near-, mid-, and longer-term applications and technologies. R&D of fuel cell technologies for transportation, stationary, and portable applications continues as does the development of improved technologies for hydrogen fuel storage and production of hydrogen from renewable resources. In FY 2012, fuel cell R&D will focus on achieving a catalyst specific power of 6 kW per gram of platinum group metal in 2012 compared to 2.8 kW per gram in 2008. The program continues to address safety and codes and standards needs and continues critical R&D needed to improve technologies and processes for manufacturing fuel cell systems and hydrogen fuel storage systems. Technology Validation efforts are also sustained to provide real-world operating data as technology progresses, and Systems Analysis continues to identify research, environmental, and economic gaps for various applications and to quantify the potential benefits of hydrogen and fuel cells—including reductions in GHGs, criteria pollutants, and petroleum use. Due to deployments underway through the Recovery Act and ongoing collection of performance and cost data, Market Transformation activities are deferred.

The **Biomass and Biorefinery Systems R&D** develops and transforms domestic, renewable, and abundant biomass resources into cost-competitive, high performance biofuels, biopower, and bioproducts through targeted planning, research, development and demonstration (RD&D) leveraging public and private partnerships. The FY 2012 request includes significant resources for a Cellulosic Biofuels Reverse Auction to add a market-based outlet for cellulosic ethanol demonstration plants. In FY 2012, the Biomass program plans to continue the deployment of integrated biorefinery technologies with private sector partners through cost-shared demonstration projects of varying scales, while also advancing biomass conversion and biopower generation technologies through targeted RD&D work with partners from National Laboratories, academic institutions, and industry. In 2012, the Biomass Program's major cost performance target for cellulosic ethanol will come due, with the program striving to achieve a modeled cost for mature technology of $2.62 per GGE ($1.76 per gallon of ethanol), based on the technical performance of its improved biofuels conversion technologies. R&D will be expanded to develop bio-based hydrocarbon fuels that are totally compatible with existing supply and distribution infrastructure. Feedstock resource and sustainability assessments will continue, algae and other advanced feedstocks will be developed and evaluated, and the program will continue to develop and improve feedstock logistics technologies to reduce feedstock costs. Additional strategic analysis and sustainability activities will serve in the evaluation of program progress toward strategic goals for technology advancement and inform biofuels policy.

The **Solar Energy Technologies Program's** (SETP) main objective is to enable solar energy achieve grid-parity without any subsidies and thus become competitive with fossil fuel throughout the US and the world by reaching a dollar-a-watt ($1/$W_{DC}$ or 4-5cents/kWh equivalent) installed price for solar photovoltaics (PV) electricity before the end of the decade. This objective is critical if the U.S. is to regain worldwide manufacturing competitiveness in PV. The SunShot initiative will invest in transformative research focusing on achieving radical improvements in PV module, balance of systems and power electronics. These efforts will be in collaboration with the DOE Office of Science and ARPA-E. The Systems Integration subprogram is developing radically new approaches to reduce the cost and improve reliability and functionality of power electronics and supporting industry development through test and evaluation standards and an understanding of grid integration issues. An enhanced Market Transformation subprogram is addressing non-hardware costs including delays in permitting, inspection, and interconnection as well as performing key analyses of policy options that can accelerate the rapid deployment of solar technologies. The program will continue to develop concentrating solar power (CSP) technologies with thermal storage to reach base-load grid parity by 2020.

The **Wind Energy** program leads the Nation's effort to accelerate the market penetration of wind energy by improving the cost, performance and reliability of wind technology, reducing risks to project development, addressing grid integration challenges, and expanding domestic manufacturing and supply chain capability. The program is aggressively working to improve wind energy technology through industry partnerships and applied research and testing, while also addressing market barriers through government and private sector stakeholder collaboration. In FY 2012, the program will develop advanced drivetrains, such as direct drive systems, for land-based and off-shore applications that increase reliability. Control systems work and performance testing on turbines and blades will be conducted using National Renewable Energy Laboratory facilities. New research partnerships will be formed to advance other components (e.g. advanced materials, improved bearings, etc.). Also in FY 2012, the program continues its launch of a robust offshore wind R&D and demonstration effort to address technical, scaling, environmental, regulatory, and address social concerns to accelerate clean energy contributions from the Nation's untapped offshore wind resources.

The **Geothermal** program's mission is to establish geothermal energy as a significant contributor to America's future electricity generation by partnering with industry, academia and the national laboratories to discover new geothermal resources, develop innovative methods, and demonstrate high-impact technologies. The program will expand its focus to include technologies with a near-term impact by confirming undiscovered hydrothermal resources with innovative exploration technologies; developing low temperature, coproduced, and permeable sedimentary resources; and transforming geothermal into a national renewable energy source.

The **Water Power** Program funds cost-shared R&D of innovative water power technologies in order to develop renewable power generation from water resources in a cost-effective and environmentally responsible manner. This program also supports a wide range of resource assessments, environmental studies, advanced modeling, and cost assessments, and other activities aimed at demonstrating the viability, reducing market barriers and accelerating deployment of these innovative technologies. FY 2012 investments for conventional hydropower are targeted at stimulating private sector deployment of capacity and efficiency upgrades and allocating R&D to reduce key cost drivers to small hydropower, environmental mitigation and pumped storage technologies. Additionally, the program is supporting the development of operational tools to maximize generation at existing and new facilities, quantifying the full value of ancillary services, and facilitating mechanisms for the market to monetize these services. Investments in FY 2012 for marine and hydrokinetic (MHK) devices will focus on development, testing and deployment of advanced prototypes to establish baseline cost of energy and performance data. The program will continue projects awarded via competitive industry solicitations to advance the technical and operational readiness of innovative, early-stage MHK systems and components

ENERGY EFFICIENCY

The **Vehicle Technologies** program (VTP) supports R&D to make highway vehicles (passenger and commercial) more efficient and capable of operating on non-petroleum fuels. VTP R&D has a major focus on technologies for transportation electrification, which include advanced batteries, power electronics, and electric motors. It also addresses lightweight materials, advanced combustion engines, and non-petroleum fuels and lubricant technologies. VTP supports early deployment and field validation of advanced technologies, efforts to reduce the vehicle miles traveled by the public. The FY 2012 budget increases emphasis on technologies that facilitate cost effective PHEVs (PHEVs – hybrids that can be recharged from an electric outlet or operated on liquid fuels), and on deployment activities to develop infrastructure for transportation electrification to accelerate the adoption of advanced vehicles, including a major new grant program for communities to advance electric vehicle infrastructure and other investments in vehicles electrification.

The **Building Technologies** program (BTP) supports RD&D to cost-effectively improve the energy efficiency (reduce the energy use) of new and existing homes and buildings. The BTP will also support the President's Better Buildings Initiative to achieve a 20 percent improvement in commercial energy efficiency by 2020. BTP strategies include the: (1) advance building technologies (e.g., solid state lighting**,** windows, heating, ventilation, air conditioning, and refrigeration), controls, systems, and whole-building design; (2) demonstrate integrated approaches (including renewable energy) for constructing significantly more efficient new homes and buildings and improving the efficiency of existing homes and buildings; (3) bring transformational tools (e.g., building energy scoring, workforce guidelines, financing models) to the market place with a goal of impacting 5 million homes and 3 billion commercial square feet by 2015; (4) support the ENERGY STAR program through the development of product test procedures and product testing; (5) support the adoption, training, and enforcement for building codes (including a major new competitive grant program for States and municipalities); and (6) include all necessary steps, consistent with the consent decree, EPAct, and EISA, to finalize legally required efficiency standards as expeditiously as possible and consistent with all applicable judicial and statutory deadlines. The FY 2012 budget increases emphasis on research on advanced building technologies, development of new partnerships to spur upgrades of commercial buildings, and efforts to capture the energy savings associated with appliance and equipment standards.

The **Industrial Technologies** program (ITP) works to catalyze cost-effective transformation of the industrial sector to dramatically reduce industry's energy and carbon intensity and secure U.S. leadership in clean energy technologies. Strategies are to (1) advance innovative manufacturing technologies (e.g., smart manufacturing, flexible electronics, bio-based products); (2) develop next generation materials; (3) expand clean energy manufacturing initiatives; (4) partner with state and local stakeholders, utilities, and universities to spur near-term energy savings in industry, promote the use of combined heat and power (CHP) and change corporate culture by encouraging continual improvement in energy performance; and (5) develop a new generation of young industrial engineers. The FY 2012 budget increases emphasis on critical research areas in support of a

renaissance in U.S. manufacturing and will include a competition for a new Energy Innovation Hub focused on critical materials

The **Federal Energy Management Program** (FEMP) facilitates the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the Nation's energy security and environmental stewardship through reductions of energy intensity in Federal facilities, increased use of renewable energy, and greater conservation of water. These goals are accomplished by facilitating government-wide performance contracts to invest in energy conservation measures, providing technical assistance, coordinating Federal reporting and evaluation, and supporting alternative fuel use in the Federal vehicle fleet. As directed by Executive Order 13514, FEMP will conduct activities associated with greenhouse gas accounting, reporting and guidance development for all Federal agencies. Funding also supports DOE efforts to meet sustainability mandates that include reducing the Department's energy intensity, greenhouse gas emissions, water consumption and increasing renewable energy use and high performance sustainable buildings. This effort are being coordinated through the new DOE Sustainability Performance Office.

The **Weatherization and Intergovernmental Activities** program accelerates sustainable energy integration and clean energy deployment, in partnership with State and local, U.S. Territory, and Tribal governments. The Weatherization Assistance Program (WAP), through a state-managed network of local weatherization providers, supports home energy retrofits for low-income families and career development opportunities for workers. The Innovations in Weatherization activity will continue to demonstrate new ways to increase the number of low-income homes weatherized that lower the Federal per-home cost for residential energy retrofits. The State Energy Program (SEP) supports the States' expanding role in utility, renewable energy, and building code policies and other high impact energy projects. Tribal Energy Activities support feasibility assessments and project planning for clean energy projects on Tribal lands.

CROSS-CUTTING

The **Facilities and Infrastructure** activity enables the acquisition and maintenance of scientific capabilities and support infrastructure at the National Renewable Energy Laboratory (NREL). NREL is EERE's primary National Laboratory and its central mission is to support the Nation's efforts in developing a portfolio of energy efficiency and renewable energy technologies.

The **Program Direction** account provides personnel and operational resources for executive and technical direction and oversight for the programs described above, including operations at headquarters and the field. EERE is increasing headquarters FTEs, while decreasing field FTEs, in order to strengthen program and project management as well as to improve communication and coordination across the EERE portfolio.

Strategic Programs funds crosscutting analysis and activities that are important for effective EERE corporate management and communication and outreach. Communication and Outreach helps to raise awareness, overcome barriers, and speed adoption of new energy efficiency and renewable energy technologies and practices. Strategic Priorities and Impact Analysis provides analysis of technology and policy innovation and ensures consistency in analysis conducted within EERE programs. Its work includes analysis of energy costs, climate change, market, policy, and energy-systems and supply chain issues. Innovation and Deployment activities focus on tools that accelerate the adoption and widespread deployment of EERE technology and systems innovations looking at financing, utility policy, urban policy, and other factors. The International Program funds targeted bilateral and multilateral collaborative efforts to accelerate R&D progress and to accelerate development of global markets for energy efficient and renewable technologies.

PROGRAM HIGHLIGHTS

The FY 2012 request continues to support a balanced and diverse portfolio of solutions to address the Nation's urgent energy and environmental challenges by: 1) researching and developing renewable energy technologies to dramatically increase the amount of clean energy produced in the U.S.; 2) advancing energy efficient technologies and practices that use less energy; and 3) providing information necessary to stimulate choices that will result in large and rapid changes in energy systems. The FY 2012 budget request advances clean energy technologies and deployment activities that are essential to breaking our addiction to oil, and changing the way we power our homes, businesses, and automobiles. The proposed Office of Energy Efficiency and Renewable Energy budget of $3,2 billion provides a diverse portfolio of activities, including:

Advanced Transportation Solutions

- Advancing essential RD&D projects to achieve cost competitive, commercial scale cellulosic ethanol and other bio-based hydrocarbon fuels that are compatible with current distribution infrastructure

- Providing a new market-based outlet for cellulosic demonstration plants via a Cellulosic Ethanol Reverse Auction
- Accelerating RD&D on PHEVs and drive-train electrification to reduce petroleum dependency and make our Nation's vehicles more efficient

Renewable Power

- Developing and demonstrating solutions to higher penetration of renewable on the grid;
- Investing in an accelerated PV program to reach $1/W installed price (the SunShot Initiative) that will lead to grid parity across the U.S. before the end of the decade
- Continued support for higher risk enhanced geothermal systems which could be deployed anywhere in the U.S. and supporting innovative technology development for lower temperature resources. Pursuing water power technologies that will lead to efficiency upgrades in conventional hydropower and baseline cost of energy of new marine (wave, ocean, etc.) devices
- Continuing to research and develop critical fuel cell technologies that enable near term commercialization pathways by reducing precious metal catalysts

Energy Efficiency

- Accelerating improvements in the nation's existing homes and buildings, leveraging the investments of the Recovery Act
- Accelerating the construction of new homes and buildings to superior and cost-effective levels of energy efficiency
- Capturing energy savings for American consumers through cost-effective appliance standards
- Supporting the advancement of clean and efficient industrial technologies and processes
- Streamlining the process for agencies' accelerated use of DOE's Super ESPC to increase federal investment in energy and water efficiency and renewable energy sources

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Hydrogen and Fuel Cell Technologies (FY 2010 $170.3; FY 2012 $100.5)…….....+$100.5

The funding for Hydrogen and Fuel Cell Technologies decreases 41 percent. The decrease reflects a refocus of the program's efforts on technology-neutral fuel cell systems for diverse applications in the transportation, stationary, and portable sectors. It also reflects focusing of the highest-priority Safety, Codes and Standards, Manufacturing R&D, and Systems Analysis activities. No Education or Market Transformation funding is planned for FY 2012.

Biomass and Biorefinery Systems R&D (FY 2010 $216.2; FY 2012 $340.5)…….+$124.3

Funding for feedstock production trials will be eliminated, and, for logistics activities will significantly decrease, to allow for the enhanced development of algal and other advanced feedstocks and support the expansion of efforts to develop advanced conversion technologies for pyrolysis oils and drop-in fuels. The FY 2012 request represents a 57.5 percent increase over FY 2010 current appropriation level. Within the program's conversion technologies R&D areas, thermochemical pathways to drop-in hydrocarbon biofuels will receive enhanced support. New biochemical waste-to-energy projects involving anaerobic digestion technologies will also be initiated, as will a new initiative to design and construct complex, multi-component, biological systems to enhance the cost-effectiveness of advanced biochemical conversion technologies and facilitate the accelerated commercial deployment of these technologies. $150M in increased funding will be rapidly infused into the emerging cellulosic biofuels industry through a Cellulosic Biofuels Reverse Auction. Funding for ongoing integrated biorefinery projects will significantly decrease to support expanded conversion technology R&D, as will funding for biopower activities, where efforts will be streamlined to focused R&D in preparation for downstream deployment efforts.

Solar Energy (FY 2010 $243.4; FY 2012 $457.0)…… .....+$213.6

The funding for Solar Energy increases by 87.8 percent. The increases within Photovoltaic R&D (+$207.4), Systems Integration (+$20.1), and Market Transformation (+$3.5) reflect ramp-ups in a major new effort in Photovoltaics (PV) to achieve grid-parity without any subsidies and thus become competitive with fossil fuel

throughout the US and the world by reaching a dollar-a-watt ($1/W OR 4-5c/kWh) installed price for solar electricity before the end of the decade. The Program is advancing this SunShot initiative through an integrated program conducted through the National Labs, industry, and universities, and in collaboration with the Office of Science and ARPA-E. The work includes focused activities on PV arrays, power electronics, and balance system technologies. To achieve this goal of grid-parity, the PV sub program invests in transformative research, development and deployment activities focusing on achieving radical improvements through manufacturing cost and efficiency improvements as well as new discoveries. The program also supports Systems Integration by developing radically new approaches to reduce the cost and improve reliability and functionality of power electronics and supporting industry development through test and evaluation standards, and tools for understanding grid integration issues. The Market Transformation subprogram is being refocused to address quantitatively non-hardware related Balance of Systems (BOS) costs including delays in permitting, streamlined permitting, inspection, and interconnection as well as performing key analyses of policy options that can accelerate the rapid deployment of solar technologies. The CSP subprogram invests heavily in thermal storage and supporting systems research and optimization to provide baseload power on demand. The CSP program in 2012 is $49M for CSP development and storage activities.

Wind Energy (FY 2010 $79.0; FY 2012 $126.9)…….....+$47.9

The funding for Wind Energy increases by 60.6 percent. In FY 2012 DOE will invest in specific activities that promote and accelerate responsible U.S. commercial offshore wind project development, decrease utility and medium sized wind cost of energy, help increase reliability, and reduce market barriers for all wind market segments. Specific investments in Offshore will address common barriers and risks to offshore projects, including financial, regulatory, technical, environmental, and social issues. Additional funds will be used to create partnerships and solicitations to accelerate the development of advanced offshore wind technology. Focus on wind energy research and development for cost reduction, improved reliability, and manufacturing process improvement will continue.

Geothermal Technology (FY 2010 $43.1; FY 2012 $101.5)…… .....+$58.4

The funding for Geothermal Technology increases by 135.5 percent. In FY 2012 GTP is developing a broader portfolio of geothermal technologies including low temperature and coproduced resources, permeable sedimentary resources and innovative exploration technologies. The EGS subprogram will also include new efforts to develop a new generation of geothermal energy systems that use waste carbon dioxide to capture heat and make electricity. The expanded portfolio of advanced technologies will enable nationwide geothermal energy deployment. This change also reflects a shift to balance long-term high-risk and near term low risk approaches.

Water Power (FY 2010 $48.7; FY 2012 $38.5)…….....-$10.2

The funding for Water Power decreases by -20.9 percent. The FY 2012 request advanced work to support the development of cost-effective incremental hydropower opportunities. Ongoing marine and hydrokinetic activities include wave and hydrokinetic technology research, development, and testing, as well as the support of multiple full-scale demonstration projects in open water; environmental impact assessments and permitting assistance; and comprehensive cost assessments by resource and technology type in order to complete techno-economic feasibility studies of MHK technology platforms by the end of 2013. The program will also continue comprehensive project-level feasibility studies across the existing conventional hydropower infrastructure in order to identify opportunities for increased incremental generation, ancillary benefits, and improved environmental performance; and support innovative technologies to reduce the cost and environmental impact of incremental hydropower opportunities.

Vehicle Technologies (FY 2010 $304.2; FY 2012 $588.0) .....+$283.8

The funding for Vehicle Technologies increases by 93.3 percent. The increase greatly expands the emphasis on electric vehicle efforts through research and development of batteries and power electronics, systems R&D on the electric drive to improve performance and cost, development of EV supporting infrastructure (e.g., advanced chargers, streamlined codes and standards), an initiative to move mature battery technologies closer to market entry through the design and development of advanced pre-production battery prototypes and efforts to help communities across the country become early adopters of advanced technology vehicles.

Building Technologies (FY 2010 $219; FY 2012 $470.7)…….....+$251.7

The funding for Building Technologies increases by 114.9 percent. Funding for Building and Appliance Market transformation also grows the Energy Star and Equipment Standards and Analysis subprograms to reflect an emphasis on more efficient appliances. Requested funding represents a continuation of the low energy building RD&D and a renewed focus of retrofit RD&D to address the existing commercial building stock, as part of the

President's Better Buildings Initiative. Building Envelope R&D will work with the Solar Energy program to more effectively integrate solar photovoltaic technology into the building envelope. BTP will also give competitive grants to empower states and localities in a Race to Green Initiative to create the conditions for dramatically accelerating energy-efficiency upgrades to existing buildings

Industrial Technologies (FY 2010 $94.3; FY 2012 $319.8)…….....+$225.5

The funding for Industrial Technologies increases by 239.2 percent. Requested funding represents a refocused program expanding resources on innovation initiatives that will accelerate revolutionary change for industrial firms and the Nation's energy economy, driving productivity advancements and improving financial performance, while slashing demand for fuels and electricity. To accomplish this, two subprograms are being significantly expanded: Next Generation Materials (+$100.8) and Next Generation Manufacturing Processes (+$77.4 over the former Industries of the Future Crosscutting subprogram). The Next Generation Materials program will include a competition for an Energy Innovation Hub focused on critical materials. The Manufacturing Energy Systems (+$15) subprogram is also expanded to address critical technical needs for clean energy manufacturing. A new *Energy Efficiency Partnership* activity (+$50.0) is proposed to help America's manufacturers upgrade existing facilities with energy efficient technologies and increased funding is requested for the Industrial Technical Assistance (+44.1) subprogram.

Federal Energy Management (FY 2010 $32.0; FY 2012 $33.1)…….....+$1.1

The funding for FEMP increases by 3.4 percent. Decreased funding for Technical Guidance and Assistance ($4.0) will support an expansion of continuous commissioning, design assistance and other project assistance for Federal agencies. Decreased funding for DOE Specific Investments (-$2.2) will continue to support DOE efforts to meet goals established by EPAct 2005, EISA 2007, Executive Order (E.O.) 13423 and E.O. 13514.

Weatherization and Intergovernmental Activities (FY 2010 $270.0; FY 2012 $393.8) … +$123.8

The funding for Weatherization and Intergovernmental Activities increases by 45.9 percent. Significant funding changes include a decrease in the State Energy Program (-$13.8) and an increase in the key activities of weatherization formula grants and innovations in weatherization within the Weatherization Assistance Program (+$110).

Facilities and Infrastructure (FY 2010 $19.0; FY 2012 $26.4)…….....+$7.4

The funding for Facilities and Infrastructure increases by 39 percent. The FY 2012 request includes funding to purchase/install essential research equipment in that facility. Additionally, NREL Operations and Maintenance increases, reflecting the completion of the Upgrade East Access to South Table Mountain and funded maintenance and repair increases to address requirements of the expanding NREL complex. Additionally, Safeguards and Security is now directly funded per the new DOE policy, rather than collected through indirect assessments.

Program Direction (FY 2010 $140.0; FY 2012 $176.6)…….....+$36.6

The funding for Program Direction increases by 26.1 percent. Salaries and Benefits reflects a reduction to 947 Federal employees, and the Federal pay freeze; this staffing decrease is enabled by a slight reduction in EERE's projected workload required to advance the Administration's priorities for the RD&D of EERE programs, business administration, and project management and oversight. Travel is reduced in anticipation of higher utilization of electronic media as well as increased teleconferencing, televideo, and telepresence in lieu of personal interface. Support Services is decreased as a result in the planned reduction of contract staff and related indirect and overhead costs, and also reflects the administration's pay freeze for DOE M&O contractor personnel. Other Related Services reflects a reduction in the infrastructure necessary to house a smaller-than-previously-planned workforce.

Strategic Programs (formerly Program Support) (FY 2010 $45.0; FY 2012 $53.2)……. +$8.2

The funding for Strategic Programs increases by 18.2 percent. Specific programs (and associated funding changes v. FY 2011 Budget Request) include: Planning, Analysis and Evaluation (-$4); Communication and Outreach (formerly Technology Advancement and Outreach) (-$0.6); Strategic Priorities and Impact Analysis (-$20.0); Innovation and Deployment (formerly Commercialization) (+$1); and International (+$2.5). The reduction largely reflects a move toward more streamlined and focused analysis activities.

Electricity Delivery and Energy Reliability

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Research and Development	121,402	0	192,817	+71,415	+58.8%
Permitting, Siting and Analysis	6,400	0	8,000	+1,600	+25.0%
Infrastructure Security & Energy Restoration	6,187	0	6,187	0	0
Program Direction	21,420	0	31,217	+9,797	+45.7%
Congressionally Directed Projects	13,075	0	0	-13,075	-100.0%
Subtotal, Electricity Delivery & Energy Reliability	***168,484***	***171,982***	***238,221***	***+69,737***	***+41.4%***
Use of Prior Year Balances	0	0	-504	-504	N/A
Total, Office Electricity Delivery & Energy Reliability	**168,484**	**171,982**	**237,717**	**+69,233**	**+41.1%**

PROGRAM DESCRIPTION

The **Office of Electricity Delivery and Energy Reliability (OE)** leads national efforts to modernize the electric grid, enhance security and reliability of energy infrastructure, and facilitate recovery from disruptions to the energy supply. Reliable, affordable, efficient, and secure electric power is vital to expanding the economic recovery, protecting critical infrastructures, and enabling the transition to renewable energy sources. OE consists of three programs: Research and Development (R&D), Permitting, Siting and Analysis (PSA), and Infrastructure Security and Energy Restoration (ISER).

The **Research and Development (R&D)** program works with industry, academia, and government to develop technologies that enhance the electric grid. It consists of the following subprograms:

- **Clean Energy Transmission and Reliability** includes activities to develop advanced transmission-driven technologies to improve grid reliability, efficiency, and security. It supports the development of methodologies to better integrate variable and intermittent renewable resources, and of tools to enhance the understanding of the power system and enable responses to changing systems. It promotes the advancement of modeling and analytical capabilities that improve grid operations and predict adverse grid situations, as well as novel research that will lead to dynamic, adaptable and self-diagnostic grid components.

- **Smart Grid Research and Development** promotes the development of an efficient, fully integrated "smart" grid through the adaptation and integration of digital information and communication technologies into the Nation's electricity delivery system. The program supports the development of utility-scale power electronics that provide faster switching capabilities, flexible power conversion, and better flow control resulting in improved grid performance and increased grid efficiency.

- **Energy Storage** conducts research and development efforts to lower the cost and improve the performance of stationary energy storage technologies for utility-scale applications. It works to develop energy storage technologies that can reduce power disturbances, and improve system flexibility to better incorporate variable and intermittent renewable resources and reduce peak demand.

- **Cyber Security for Energy Delivery Systems** conducts research and development activities that address vulnerabilities within the Nation's electricity delivery system to reduce the risk of energy disruptions due to cyber attacks, a fundamental need with the increased deployment of smart grid technologies and the growing sophistication of cyber threats.

The **Permitting, Siting, and Analysis (PSA)** program provides expert technical assistance to states, tribes and regions on electricity policies, programs and market mechanisms that increase access to reliable, affordable and sustainable energy sources. PSA provides analysis for the long-term, interconnection-level planning required for the continued growth and integration of renewable and other clean energy resources. In addition, the program implements the transmission provisions of the Energy Policy Act of 2005, and administers the international electricity regulatory program through cross-border permitting.

The **Infrastructure Security and Energy Restoration (ISER)** program leads national efforts to secure the Nation's critical infrastructure against threats and hazards. It ensures the reliability, survivability and resiliency of the energy infrastructure by coordinating the Department's response to energy emergencies, providing assistance in securing critical energy infrastructure, coordinating technical and policy support for control systems security, and collaborating with all levels of government and industry to facilitate recovery from energy supply disruptions and national security incidents. This program carries out the Department's responsibilities as the lead Energy Sector Specific Agency for protecting the nation's critical energy infrastructure.

Program Direction funds federal staff and support services for the management, oversight and technical direction of OE.

PROGRAM HIGHLIGHTS

The FY 2012 budget request represents a strong commitment to bringing the next generation of grid modernization technologies closer to deployment and commercialization. The increased investment will emphasize the integration of renewable energy sources, focus on long-term system planning, expand analytical capabilities, and promote aggressive approaches to next-generation grid technologies. It also supports a new Smart Grid Technologies and Systems Energy Innovation Hub.

Energy storage has gained importance in the energy field as a potential answer to many of the problems being experienced on the electric grid. Successful Recovery Act demonstrations are showing the ability of these technologies to provide stability and consistency to the intermittent nature of renewable generation, making usage of energy from these sources on a larger scale more feasible. The funding increase supports demonstrations for a new suite of cost-shared grid level storage projects, as well as the acceleration of research and development studies that will enter into a second phase to develop and test prototype materials. Analysis will start on new methods for identifying promising locations for pumped hydro and compressed air energy storage systems. Research will also expand ongoing activities supporting successful integration of renewable energy resources into the grid by modifying their variability, and collaborations with utilities and renewable developers to field test promising technologies. Aggressive support of storage deployment will provide the basis of commercialization and the market pull for development of more effective storage technologies.

FY 2012 will feature expanded analysis and collaboration with state, local and regional bodies on interconnection-level advanced transmission system approaches. Of primary focus is continued evaluation of the effects that the transition to a low-carbon energy future will have on the operation and planning of the electric system, especially from the regulatory perspective. Target areas for expanded discussion include efficient ways for balancing areas to increase cooperation, design and evaluation of offshore transmission, and the system requirements to integrate growing amounts of renewables into the grid.

In support of the President's clean energy goals, FY 2012 expands research efforts in advanced modeling of the grid into other system layers, creating comprehensive, integrated models that provide a more in-depth system understanding, as opposed to using separate, "isolated" models that only answer specific questions. The program will include investigations into, among others, the effects of a communications layer overlaying the electric system model, and the integration of distribution models into higher-level transmission system models.

FY 2012 will also mark the establishment of a new Energy Innovation Hub, providing a fully integrated approach to accelerating the development and commercialization of the next generation of grid technologies. The Hub focuses on the development of next-generation grid technologies and systems, and will tackle the tough technological, economic, and policy factors that affect modernization of the grid.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Clean Energy Transmission and Reliability (FY 2010 $37.4; FY 2012 $60.8)…… +$23.4
The increase in funding represents the expansion of the Advanced Modeling Grid Research initiative and the establishment of a new Energy Innovation Hub, offset by a reduction due to the closeout of the Advanced Cables and Conductors subprogram. Advanced Modeling Grid Research develops the capabilities and mathematical models to analyze the large volumes of data on grid behavior collected through the deployment of advanced sensor technologies (PMUs) and increasing deployment of smart grid technologies. The new Smart Grid Technology and Systems Hub will bring together experts from across the electricity industry to explore the use of newly developed technologies to provide dynamic, adaptable characteristics to components and increase overall grid resiliency.

Smart Grid Research and Development (FY 2010 $31.5; FY 2012 $45.0)…….. +$13.5
The increase in funding supports the Power Electronics activity and the expansion of research to understand the effects of plug-in electric vehicles on grid performance. The Power Electronics activity invests in the development of solid-state devices that give utilities the ability to more effectively and quickly deliver power to their customers while increasing reliability, security and flexibility to the Nation's electric grid. Working closely with universities, efforts in FY 2012 will focus on development of wide bandgap semiconductors based on silicon carbide and gallium nitride materials.

Energy Storage (FY 2010 $13.6 FY 2012 $57.0) ……... +$43.4
The funding increase supports demonstrations for a new suite of cost-shared grid level storage projects, as well as the acceleration of research and development studies that will enter into a second phase to develop and test prototype materials. Analysis will start on new methods for identifying promising locations for pumped hydro and compressed air energy storage systems. Research will also expand on current activities supporting successful integration of renewable energy resources into the grid by modifying their variability, and collaborations with utilities and renewable developers to field test promising technologies. Aggressive support of storage deployment will provide the basis of commercialization and the market pull for development of more effective storage technologies.

Cyber Security for Energy Delivery Systems (FY 2010 $38.9; FY 2012 $30.0)……. -$8.9
The reduction in funding levels from FY 2010 reflects the one-time funding for the National Energy Sector Cyber Organization in FY 2010 and the successful completion of several industry-led projects.

Permitting, Siting and Analysis (FY 2010 $6.4; FY 2012 $8.0)……. +$1.6
Additional funding supports expanded analysis of advanced transmission system approaches, including the balancing areas' effect on variable renewables integration, off shore resources, and the system requirements to integrate them.

Program Direction (FY 2010 $21.4; FY 2012 $31.2)……. +$9.8
The increase supports 87 FTEs at Headquarters and thirty-one FTEs at the National Energy Technology Laboratory. The majority of new FTEs since 2010 are associated with the management of Recovery Act projects.

Environmental Management

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Defense Environmental Cleanup	5,652,158	5,642,331	5,410,162	-241,996	-4.3%
Non-Defense Environmental Cleanup	254,673	244,673	219,121	-35,552	-14.0%
Uranium Enrichment D&D Fund	573,850	573,850	504,169	-69,681	-12.1%
Discretionary Payments	-463,000	-463,000	0	+463,000	+100.0%
Use of Prior Year Balances	-11,787	0	-3,381	+8,406	+71.3%
Total, Environmental Management (Net)	**6,005,894**	**5,997,854**	**6,130,071**	**+124,177**	**+2.1%**

PROGRAM DESCRIPTION

The **Environmental Management (EM)** program was created in 1989 to safely manage the cleanup of the environmental legacy from 50 years of nuclear weapons production and government-sponsored nuclear energy research at sites around the country. The program includes the management of the remediation of sites contaminated by defense and civilian activities. DOE is requesting a total of $6.1 billion in FY 2012.

EM is requesting program funds in three appropriation accounts: Defense Environmental Cleanup (FY 2010 $5,652 million; FY 2012 $5,410 million); Non-Defense Environmental Completion (FY 2010 $255 million; FY 2012 $219 million); and Uranium Enrichment Decontamination and Decommissioning Fund (FY 2010 $574 million; FY 2012 $504 million).

PROGRAM HIGHLIGHTS

The FY 2012 budget request totals $6.1 billion, an increase of $124 million from the FY 2010 appropriation. This funding level ensures that EM can meet its FY 2012 environmental cleanup compliance requirements. In addition, this funding level allows EM to leverage Recovery Act efforts towards FY 2012 cleanup scope such as, soil and groundwater remediation, facility D&D, and radioactive waste disposition. All of which provide the opportunity to reduce the legacy cold war footprint by cleaning up facilities, land and water resources in communities.

In addition, the FY 2012 request continues the critical investments in science and technology necessary to clean up the cold war legacy. These investments range from technology adaptations or demonstrations embedded in specific cleanup projects needed to ensure that a specific cleanup technology meet cleanup goals (either removing or containing contaminants of concern) and schedules to development and deployment of transformational technologies such as, the acceleration of tank waste retrievals by utilizing Rotary Microfiltration and Small Column Ion Exchange at tank treatment technologies.

Defense Environmental Cleanup

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Closure Sites	41,468	0	5,375	-36,093	-87.0%
Hanford Sites	990,080	0	913,712	-76,368	-7.7%
Idaho National Laboratory	464,168	0	382,769	-81,399	-17.5%
NNSA Sites and Nevada Off-sites	295,631	0	423,692	+128,061	+43.3%
Oak Ridge Reservation	179,048	0	176,100	-2,948	-1.6%
Office of River Protection	1,096,600	0	1,361,391	+264,791	+24.1%
Savannah River Sites	1,209,949	0	1,224,144	+14,195	+1.2%
Waste Isolation Pilot Plant	230,337	0	228,926	-1,411	-0.6%
Program Direction	345,000	0	321,628	-23,372	-6.8%
Program Support	34,000	0	0	-34,000	-100.0%
Community, Regulatory and Program Support	0	0	91,279	+91,279	N/A
Safeguards and Security	279,437	0	248,826	-30,611	-11.0%
Technology Development	19,440	0	32,320	+12,880	+66.3%
Uranium Enrichment D&D Fund Contribution	463,000	0	0	-463,000	-100.0%
Subtotal, Defense Environmental Cleanup	***5,648,158***	***5,638,331***	***5,410,162***	***-237,996***	***-4.2%***
Use of Prior Year Balances	-11,787	0	-3,381	+8,406	+71.3%
Congressionally Directed Projects	4,000	0	0	-4,000	-100.0%
Total, Defense Environmental Cleanup	**5,640,371**	**5,642,331**	**5,406,781**	**-233,590**	**-4.1%**

PROGRAM DESCRIPTION

The FY 2012 request for the Defense Environmental Cleanup appropriation is $5.4 billion. This request supports the largest portion of the Environmental Management mission, which is to complete the cleanup of the defense weapons research and production legacy. Upon completion, sites or portions of sites will be turned over to other DOE programs or to the Office of Legacy Management for long-term surveillance and maintenance. Defense Environmental Cleanup provides funding in accounts that are generally organized by site or location, such as the Savannah River Site. It also includes funding for Safeguards and Security, Technology Development and Deployment, community, Regulator and Program Support, and Program Direction. This appropriation includes funding for projects at the Idaho National Laboratory, Oak Ridge Reservation, Defense Closure sites (post-closure administration activities), the Hanford Site, the Savannah River Site, the Waste Isolation Pilot Plant (WIPP), and legacy cleanup at National Nuclear Security Administration (NNSA) sites.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Closure Sites (FY 2010 $41.5, FY 2012 $5.4) .....-$36.1
Responsibility for post-closure administration at Rocky Flats, including long-term stewardship of the remedy, contractor post-retirement benefits, and records management transferred to the Office of Legacy Management.

Hanford Site (Richland) (FY 2010 $990.1; FY 2012 $913.7) .....-$76.4
The Richland Operations Office manages Hanford site cleanup activities associated with the production of nuclear materials during the Cold War, including soil and groundwater remediation, facility decontamination and decommissioning (D&D), stabilization and disposition of nuclear materials and spent nuclear fuel, and disposition of waste other than high-level waste, which is managed by the Office of River Protection. Defense-related Hanford activities are funded in one control point: Hanford Site.

At Richland, significant progress will continue to be made along the River Corridor. EM will complete the interim remedial actions for the 100 D and 100 H Areas, complete disposition of eleven facilities, complete removal of knock-out pot material from the K-West Basin, and initiate remediation of the deep chromium contamination waste site 100-C-7. In addition, the request supports high priority groundwater remediation efforts. Specifically, EM will complete operational testing of the groundwater system for treating technetium at S/SX tank farm, expand current pump-and-treat system at 100-HR-3 operable unit, complete 100 and 300 Areas remedial investigations to obtain final records of decision, and begin Phase 1 operations of 200W pump and treat system. These efforts are aimed at reducing the Richland site cleanup footprint.

Request includes increases for the maintenance and planned upgrades at T Plant to support the storage of K Basin sludge, and the additional operations required for groundwater remediation systems in the Central Plateau as well as completion of two buildings, one contaminated soil site and interim safe storage of the K-East reactor. The D&D of these facilities will allow access to the soil sites and ultimately will prevent Chromium-6 (from these sites) from reaching the Columbia River. The decreases are associated with the completion of shipments of special nuclear materials from Plutonium Finishing Plant in FY 2010 and a reduction in facilities surveillance and maintenance, project management and site services due to specific decontamination and decommissioning activities being completed through the American Recovery and Reinvestment Act in FY 2011, reduced support for sludge removal activities, and completion of interim remedial actions in the 100 and 300 Areas.

Office of River Protection (FY 2010 $1,096.6; FY 2012 $1,361.4) .....+$264.8
Office of River Protection's primary goal is the safe management and treatment of approximately 53 million gallons of high-level radioactive liquid waste in the 177 underground storage tanks at Hanford. Funding for River Protection activities is funded in two control points: the Waste Treatment and Immobilization Project ($840.0) and Tank Farm Activities ($521.4).

This request funds construction of the Waste Treatment and Immobilization Plant (WTP) to immobilize radioactive waste at Hanford consistent with the schedule to complete project design in FY 2013, facility construction in FY 2016, and facility commissioning in FY 2019. Increased funding for WTP is needed to support the increased confidence level to complete the project within budget and on schedule. The request will enable the project to meet its commitment of operations in FY 2019 within the current baseline Total Project Cost of $12.26 billion. In FY 2012, the two subprojects for the Waste Treatment and Immobilization Plant Project were combined into a single control point: 01-D-416 Waste Treatment and Immobilization plant ($840.0). However, EM will continue to provide detailed information on the separate subprojects for Congressional review.

Increased funding also supports critical tank farm infrastructure upgrades and waste feed delivery needed to ensure waste feed is available for start-up and commissioning of the Waste Treatment and Immobilization Plant operations. This request also supports one bulk retrieval and three hard heel removals from the C-Farm Single Shell tanks.

Idaho National Laboratory (FY 2010 $464.2; FY 2012 $382.8) .....-$81.4
The FY 2012 request supports operations of the Sodium Bearing Waste treatment facility at Idaho. Testing and readiness verification will be completed in preparation for hot startup is scheduled for January 2012. This project will treat approximately 900,000 gallons of sodium bearing waste stored in waste tanks that are 35 to 45 years old. The treatment of this waste will enable EM to close four tanks, complete treatment of all active waste, and meet the Notice of Noncompliance – Consent Order Modification to cease use of the Tank Farm Facility by December 31, 2012.

Additionally, Idaho's request will support requirements of the Idaho Settlement Agreement to dispose of remote-handled low-level waste at the Radioactive Waste Management Complex and mixed low-level waste at appropriate off-site disposal facilities; and characterize and certify remote-handled TRU waste at the Idaho Nuclear Technology and Engineering Center in preparation for shipment to the Waste Isolation Pilot Plant (WIPP). The request will provide for shipping stored contact-handled TRU waste to WIPP using the Advanced

Mixed Waste Treatment Facility, and for receipt, characterization, and certification of TRU waste from other DOE sites in preparation for shipment to WIPP.

The request includes an increase for additional characterization and certification of contact-handled transuranic waste from other small DOE sites in preparation for shipment to the Waste Isolation Pilot plant, and provide for two additional Accelerated Retrieval Projects to operate in the facilities that were constructed with American Recovery and Reinvestment Act funding. As well as decreases associated with the completion of the transfer from wet to dry storage of spent (used) nuclear fuel; completion of treatment of the sodium bonded fuel from the Fast Flux test Facility; completion in construction for the Sodium Bearing Waste Treatment project, completion of grouting the tank farm off-gas piping system and the completion of relocation of the Emergency Communication System and dial room.

NNSA Sites (FY 2010 $295.6; FY 2012 $423.7) ..... +$128.1
The request provides for cleanup of the legacy of environmental contamination and waste at National Nuclear Security Administration (NNSA) sites. Included are Los Alamos National Laboratory ($357.9), Lawrence Livermore National Laboratory ($0.9), Nevada Test Site ($63.3), and Separations Process Research Unit in New York ($1.5).

- **Los Alamos National Laboratory** reflects an increase ($160.4) in FY 2012. This increase positions EM to aggressively pursue cleanup at LANL in accordance with the Consent Order while working with regulators to facilitate cleanup as quickly as possible. The increase supports Solid Waste and Soil and Groundwater activities which are critical to achieving the fence-to-fence cleanup required under the Consent Order. Specifically, 1,300 cubic meters of mixed low level waste and 1,000 cubic meters of transuranic waste will be disposed in FY 2012. In addition, the budget supports completion of Material Disposal Area A exhumation of the wastes in the central pit and eastern trenches, removal and disposal of the tanks, backfill the excavation areas, covering and sampling of the area for release.

- **Lawrence Livermore National Laboratory** reflects a decrease (-$2.1) in FY 2011. The decrease reflects completion of soil removal activities at the Building 850 Firing Table.

- The request for **Nevada Test Site** supports operation of the low-level waste disposal facility, and ongoing characterization and remediation activities. The decrease of (-$11.0) reflects completion of new Resource Conservation and Recovery Act mixed low-level waste disposal cell in FY2010.

- The decrease for **Separations Process Research Unit** (-$13.5) reflects the completion of contaminated soil removal, completion of North Field activities and transfer to Naval Reactors, and removal of tanks and tank waste from building H2 vaults. Due to several contamination incidents in early FY 2011, demolition and closure of the G2 and H2 buildings will be deferred from FY 2011 to FY 2012.

Oak Ridge Reservation (FY 2010 $179.0; FY 2012 $176.1)..... -$3.0
In FY 2012, the operation of the Transuranic Waste Processing Center (TWPC) will transfer from the Recovery Act program back into the base program and will allow EM to continue processing contact-handled and remote-handled TRU in order to meet the Site Treatment Plan milestone and to prepare TRU waste for certification, shipment, and disposal at WIPP.

Increase in funding supports Transuranic Waste Processing Facility accelerated scope for receipt, processing, and repackaging of contact-handled and remote-handled waste previously funded under the American Reinvestment Recovery in FY 2010 and in FY 2011, modest expansion of Data Quality Objective characterization requirements to areas outside of the main Oak Ridge National Laboratory central campus in support of the Oak Ridge National Laboratory Soils and Sediments project as well as funding for the regulatory requirement to perform remedial activities at the Screen Arts site. Safety activities related to the Department's inventory of U-233 in Building 3019 will be funded through the use of uncosted carryover in FY2012, pending final alternatives evaluation to proceed with revised path forward in FY 2013.

Savannah River (FY 2010 $1,209.9; FY 2012 $1,224.1) ..... +$14.1
Savannah River Site is responsible for stabilization, treatment and disposition of legacy nuclear materials and wastes, spent nuclear fuels, and remediation of contaminated media resulting from nuclear materials produced during the Cold War. Savannah River activities are funded in one control point: Savannah River Site.

In FY 2012, at the Savannah River Site, the largest portion of the request supports the Tank Waste Liquid Waste Management Program, which includes the operation of the Defense Waste Processing Facility, as well as operation of the Actinide Removal Process and Modular Caustic Side Extraction units. These units will be needed through construction of the Salt Waste Processing Facility ($170.1). In addition, the request supports the Tank 48 return to service project and closure of two additional tanks. Closure of these tanks is the first delivery on the recently approved enhanced tank waste strategy commensurate with the recent change to a performance-based liquid waste contractor and the deployment of at-tank pre-treatment technologies such as, rotary microfiltration and small column ion exchange.

H Canyon will be maintained in a safe standby state, pending the decision on spent (used) nuclear fuel processing. The site will also continue to receive weapons grade surplus non-pit plutonium from the Los Alamos National Laboratory and Lawrence Livermore National Laboratory, which concludes in FY 2012, and supports the Global Threat Reduction Initiative through continued receipt of foreign and domestic research reactor spent (used) fuel.

Increases in the FY2012 budget reflect EM's commitment to its enhanced tank waste strategy initiative which will support closure of two tanks and position the site to accelerate additional tank closures. Increases also reflect the resumption of base funding in FY 2012 for management of low-level, mixed low-level and hazardous waste which was previously included in the American Recovery and Reinvestment Act appropriation from FY 2009-FY 2011, and the continuation of Tank 48 Treatment Process Project. Decreases reflect the one time funding for K-Area purification vault in FY 2010 and the completion of ecological work scope in FY 2010 related to the Savannah River environmental cleanup and not funded by the American Recovery and Reinvestment Act appropriation.

Waste Isolation Pilot Plant (FY 2010 $230.3; FY 2011 $228.9)..... -$1.4
Funding supports the National Transuranic Waste Program, managed by Carlsbad Field Office, including the operation of the Waste Isolation Pilot Plant, the national repository for defense-generated transuranic waste, near Carlsbad, New Mexico. This funding level supports 21 contact handled and 5 remote handled transuranic waste shipments per week. FY 2012 decrease reflects reduced level of regulatory development and support activities, due to Hazardous Waste Permit Renewal and Compliance Recertification being completed, and reduction in the number of sites at which the Central Characterization Project is deployed because only a few small quantity sites remain to be closed in FY 2012.

Program Direction (FY 2010 $345.0; FY 2012 $321.6).....-$23.4
The federal workforce is responsible for the overall direction and administrative support of the EM program, including both headquarters and field personnel. It provides funding for salaries, benefits, travel, training, support services, and other related expenses for 1,582 FTEs, 1,084 of which are located in field offices, 325 in Headquarters, and 173 FTEs are assigned to the EM Consolidated Business Center.

Community, Regulatory, and Program Support (FY 2010 $0.0; FY 2012 $91.3)..... -+$91.3
In FY 2012, EM will be consolidating EM Headquarters policy and oversight activities, community and regulatory support and contract/post closure activities across the EM complex into a single control point. The consolidation of these activities into a single control point will allow for greater transparency and accountability of overhead activities but will also provide flexibility during the year of execution.

Safeguards and Security (FY 2010 $279.4; FY 2012 $248.8).....-$30.6
The FY 2012 request ensures appropriate levels of protection for EM facilities and cleanup sites, anticipates evolving threats, and maintains a balance of the security mission with the operation of the Waste Isolation Pilot Plant, East Tennessee Technology Park, West Valley, Paducah, Portsmouth, Hanford, and Savannah River sites. Decrease for Oak Ridge (-$15.1) reflects reduced requirements at the East Tennessee Technology Park and at the TRU Waste Facility. Decrease for Richland (-$13.5) is due to off-site plutonium de-inventory completion and associated closure of the Plutonium Finishing Plant protected area and the completion of upgrades for Safeguards and Security life-cycle cost reductions, permitting a reduction in site protective force requirements.. Decrease for Savannah River (-2.1) is attributed to the use of prior year carryover funding in FY 2012 to offset FY 2012 Safeguards and Security requirements at the Savannah River Site

Technology Development and Deployment (FY 2010 $19.4; FY 2012 $32.3)..... +$12.8
EM has requested $32.3 million in technology development and deployment funding in FY 2012. This funding will be utilized to support groundwater and soil remediation subsurface science issues to support development of state-of the-art methods and models for fate and transport in the subsurface. This reduces the uncertainty in the current models and methods for performance assessments.

In addition the FY 2012 request includes $60 million in technology development funding to continue the acceleration of development and deployment of needed technologies to address tank waste issues related to tank treatment, waste chemistry for characterization and separation; advanced retrieval technologies; improved melter throughput; and increased glass waste loading. The majority of this work would be funded by the $60 million requested within the Office of River Protection to support Hanford and Savannah River tank waste issues.

The FY 2012 request also includes other research and development initiatives being conducted across the complex in conjunction with the national laboratories. Many of these activities are embedded in cleanup projects and are needed to ensure that specific cleanup remedies/technologies meet cleanup schedules and end states such as, removing or containing contaminants of concern.

Non-Defense Environmental Cleanup

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Fast Flux Test Reactor Facility (WA)	7,652	0	2,703	-4,949	-64.7%
Gaseous Diffusion Plants	100,885	0	100,588	-297	-0.3%
Small Sites	88,062	0	57,430	-30,632	-34.8%
West Valley Demonstration Project	58,074	0	58,400	+326	+0.6%
Total, Non-Defense Environmental Cleanup	**254,673**	**244,673**	**219,121**	**-35,552**	**-14.0%**

PROGRAM DESCRIPTION

The FY 2012 request for the Non-Defense Environmental Cleanup appropriation is $219.1million, a decrease of $35.5 million from FY 2010. This appropriation supports activities that address the environmental legacy resulting from civilian nuclear energy research. The nuclear energy research and development carried out by the Department and its predecessor agencies generated waste and contamination that pose unique problems, including large quantities of contaminated soil and groundwater and a number of contaminated structures. Upon completion of cleanup activities, these sites or portions of a site are turned over to other DOE program landlords or to the Office of Legacy Management for long-term surveillance and maintenance.

The Non-Defense Environmental Cleanup provides funding in several accounts: Fast Flux Test Reactor Facility, Gaseous Diffusion Plants, Small Sites, and the West Valley Demonstration Project. Funding for the Small Sites account includes projects at Argonne National Laboratory, Brookhaven National Laboratory, the Energy Technology Engineering Center, Idaho National Laboratory, Moab, and the Stanford Linear Accelerator Center.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

West Valley Demonstration Project (FY 2010 $58.1; FY 2012 $58.4.....+$0.3
This project includes solid waste stabilization and disposition, and nuclear facility decontamination and decommissioning activities at West Valley, New York. The FY 2012 request supports continued processing and disposal of low level and transuranic waste generated from the decontamination and decommissioning activities at the Main Process Plant Building.

Gaseous Diffusion Plants (FY 2010 $100.9; FY 2012 $100.6).....-$0.3
The EM program includes the conversion of depleted uranium hexafluoride (DUF6) produced during enrichment operations at the gaseous diffusion plants at Paducah, Kentucky, and Portsmouth, Ohio, to a more stable form, and the maintenance and storage DUF6 cylinders and facilities.

Paducah (FY 2010 $40.5; FY 2012 $52.4).....+$11.9
The FY 2012 request supports continuation of ramp up (including increase in staff) necessary for hot functional testing, leading to full operations of the DUF6 Conversion Facility

Portsmouth (FY 2010 $60.4; FY 2012 $48.1).....-$12.2
The FY 2012 request supports the conclusion of the Highly Enriched Uranium Program activities and additional support for the lead plant start up was no longer necessary, and reflects transition to full-scale operations of the DUF6 Conversion Facility.

Fast Flux Test Reactor Facility (FY 2010 $7.7; 2011 $2.7)..... -$4.9
The FY 2012 request supports a reduction in requirements for fire systems resulting in a comparable reduction in surveillance and maintenance work.

Small Sites (FY 2010 $88.1; FY 2012 $57.44)..... -$30.6
Activities include cleanup, and decontamination and decommissioning activities at small non-defense sites and projects at Argonne National Laboratory, Brookhaven National Laboratory, Energy Technology Engineering Center, Moab site, and Stanford Linear Accelerator Center, and non-defense activities at the Idaho National Laboratory.

Argonne National Laboratory (FY 2010 $10.0; FY 2012 $0.0) ..... -$10.0
EM legacy cleanup is complete at Argonne. Cleanup of excess facilities is being completed with funding provided by the National Nuclear Security Administration to transfer $10 million to EM for waste cleanup activities that are in addition to the legacy scope of work completed by EM at Argonne National Laboratory.

Brookhaven National Laboratory (FY 2010 $15.0; FY 2012 $8.2).....-$6.8
The FY 2012 request will support surveillance and maintenance activities for the Soil and Water Remediation Project during FY 2012 and in FY 2013 will initiate the transfer to the Office of Science.

Idaho National Laboratory (FY 2010 $5.0; FY 2012 $5.1) ..... +$0.1
The FY 2012 request provides for ongoing stewardship of spent nuclear fuel from Three Mile Island and Fort Saint Vrain.

Energy Technology Engineering Center (FY 2010 $10.5 FY 2012 $10.7) …+$0.2
The FY 2012 request provides ongoing program and landlord support, site wide environmental monitoring, radiological groundwater characterization, and support to the Environmental Protection Agency for Area IV radiological characterization study.

Moab Site (FY 2010 $39.0; FY 2012 $31.0)..... -$8.0
FY 2012 activities include Moab and Crescent Junction operations and maintenance, continued monitoring and analysis of contaminated groundwater, and continued remediation of properties surrounding the tailings pile. Decrease reflects additional appropriated funds that were used to transport a greater volume of tailings than was planned for FY 2010.

Stanford Linear Accelerator Center (FY 2010 $7.1; FY 2012 $2.4)..... -$4.7
This project scope includes remediation of chemical contamination of soil and groundwater resulting from decades of physics research at the site. FY 2012 activities include operation of groundwater treatment systems and soil remediation. Decrease reflects completion of legacy scope. EM will support surveillance and maintenance activities during FY 2012 and in FY 2013 will initiate the transfer to the Office of Science.

Uranium Enrichment Decontamination and Decommissioning Fund

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Decontamination and Decommissioning	573,850	573,850	0	-573,850	-100.0%
Oak Ridge	0	0	182,747	+182,747	N/A
Paducah	0	0	77,780	+77,780	N/A
Portsmouth	0	0	243,642	+243,642	N/A
Total, Uranium Enrichment D&D Fund	**573,850**	**573,850**	**504,169**	**-69,681**	**-12.1%**

PROGRAM DESCRIPTION

The Energy Policy Act of 1992 established the Uranium Enrichment Decontamination and Decommissioning Fund (UED&D Fund) to carry out environmental management responsibilities at the nation's three gaseous diffusion plants. These responsibilities include decontamination and decommissioning, remedial actions, waste management, landlord requirements, surveillance, and operation and maintenance activities associated with conditions at the plants prior to the presence of the U.S. Enrichment Corporation. The UED&D Fund received receipts from commercial utilities based on their historic purchases of uranium enrichment services, measured in separative work units. The remainder of the annual deposit to the UED&D Fund is made by DOE and is authorized to come from annual appropriations. The law also requires DOE to administer a reimbursement program for remediation activities at active uranium and thorium processing sites that sold material to the U.S. government. The request for UED&D Fund activities for FY 2012 is $504.2 million.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Decontamination and Decommissioning (FY 2010 $573.9; FY 2012 $504.2)……..-$69.7
Office of Environmental Management manages the maintenance, remediation, and decontamination and decommissioning of uranium processing facilities and the gaseous diffusion plants at Paducah, Kentucky; Portsmouth, Ohio; and the East Tennessee Technology Park in Oak Ridge, Tennessee. In FY 2012, a site control level is being instituted within the Uranium Enrichment Decontamination and Decommissioning Appropriation.

Oak Ridge East Tennessee Technology Park (ETTP) (FY 2010 $225.0; FY 2012 $182.7).....-$42.3
The FY 2012 request focuses on maintaining compliance with the ETTP, formerly K-25, safety basis requirements and continuing demolition of the K-25 process building. Decrease reflects completion of contract transition activities and completion of some pre-demolition activities in the North End and East Wing of the K-25 building.

Paducah (FY 2010 $116.5; FY 2012 $77.9)..... -$38.6
FY 2012 request supports continued landfill operations, pump and treat operations, remediation of groundwater, and demolition of C-340 and C-410 complexes. Decrease reflects completion of building C-400 Phase I and II and of enhanced groundwater monitoring facilities. Decrease reflects the completion of disposition of all legacy waste (that was generated by activities at the Paducah Gaseous Diffusion Plant prior to 1993) at offsite disposal facilities and completion of enhanced groundwater plume monitoring system and optimization of the Northwest plume pump and treat system.

Portsmouth (FY 2010 $232.4; FY 2012 $243.6) .....+$11.2
The FY 2012 request supports ongoing gaseous diffusion plant decontamination and decommissioning and increased disposal of low-level waste associated with those activities. Increase reflects acceleration of decontamination and decommissioning activities to realize life-cycle cost savings. Increase supports removal of process motors from X-326 and an increased focus on decontamination and decommissioning activities subsequent to facility turnover and additional funding necessary to complete disposition at offsite disposal

facilities, including the Nevada National Security Site, of uranium materials stored in the Uranium Management Center from universities and other sites that no longer utilize material in research programs and from cascade operations at the site.

Uranium/Thorium Reimbursements (FY 2010 $0.0; FY 2012 $0.0) ..... +$0.0
Title X of the Energy Policy Act of 1992 authorizes reimbursement of uranium and thorium processing site licensees for a portion of their cost of cleanup (federal-related byproduct material). Funding provided by the American Recovery and Reinvestment Act will be used to reimburse eligible outstanding claims owed to eleven licensees in FY 2012.

Legacy Management

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Other Defense Activities					
Legacy Management	177,618	0	157,514	-20,104	-11.3%
Program Direction	12,184	0	12,586	+402	+3.3%
Congressionally Directed Projects	1,000	0	0	-1,000	-100.0%
Total, Office Of Legacy Management	**190,802**	**190,802**	**170,100**	**-20,702**	**-10.8%**

PROGRAM DESCRIPTION

The **Office of Legacy Management (LM)** ensures the sustainable protection of human health and the environment after DOE cleanup is completed, and continues management of certain retirement benefits for former contractor personnel after site closure.

This program supports long-term stewardship activities (e.g., groundwater monitoring, disposal cell maintenance, records management, and management of natural resources) at sites where active remediation has been completed. In addition, at some sites the program includes management and administration of pension and benefit continuity for contractor retirees. The FY 2012 budget request of $170 million supports these activities.

PROGRAM HIGHLIGHTS

The FY 2012 request provides $170 million to carry out all legacy management functions. In FY 2012, post closure responsibility for long-term stewardship activities at 91 sites and pension and benefit claims for former contractor employees at 7 sites. Funding for the Mound, Ohio, and Yucca Mountain records, IT, and pension and benefit activities for former contractor employees are included within the LM budget.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Other Defense Activities

Legacy Management (FY 2010 $177.6; FY 2012 $157.5) ..... -$20.1
The decreased funding reflects the one-time use of prior year balances associated with the Office of Environmental Management for the Mound, Ohio site as well as reduced cost estimates associated with funding pensions and post-retirement benefits to former contractor employees at the Rocky Flats site.

Program Direction (FY 2010 $12.2 FY 2012 $12.6)..... +$0.4
The increased funding reflects the addition of Federal staff to manage records and information, including the Licensing Support Network, associated with the Yucca Mountain project. Legacy Management continues to administer its programs consistent with its delegation as a High Performing Organization.

Nuclear Energy

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Nuclear Energy Enabling Technologies	0	0	97,364	+97,364	N/A
Integrated University Program	5,000	0	0	-5,000	-100.0%
LWR SMR Licensing Technical Support	0	0	67,000	+67,000	N/A
Reactor Concepts RD&D	0	0	125,000	+125,000	N/A
Generation IV Nuclear Energy Systems	212,904	0	0	-212,904	-100.0%
Nuclear Power 2010	101,960	0	0	-101,960	-100.0%
Fuel Cycle Research and Development	131,938	0	155,010	+23,072	+17.5%
International Nuclear Energy Cooperation	0	0	3,000	+3,000	N/A
Radiological Facilities Management	71,760	0	64,888	-6,872	-9.6%
Idaho Facilities Management	172,716	0	150,000	-22,716	-13.2%
Program Direction	73,000	0	93,133	+20,133	+27.6%
Transfer from State Department	2,800	0	0	-2,800	-100.0%
Congressional Directed Projects	2,500	0	0	-2,500	-100.0%
Undistributed NE					
Subtotal, Nuclear Energy	***774,578***	***786,637***	***755,395***	***-19,183***	***-2.5%***
Adjustments:					
Use of Prior Year Balances	0	0	-1,367	-1,367	N/A
Subtotal, Nuclear Energy	***774,578***	***786,637***	***754,028***	***-20,550***	***-2.7%***
Other Defense Activities					
Idaho Sitewide Safeguards and Security	83,358	83,358	98,500	+15,142	+18.2%
Subtotal, Other Defense Activities	***83,358***	***83,358***	***98,500***	***+15,142***	***+18.2%***
Total, Nuclear Energy	**857,936**	**869,995**	**852,528**	**-5,408**	**-0.6%**

The **Office of Nuclear Energy (NE)** is funded in two accounts within the Energy and Water Development Appropriation: Nuclear Energy and Other Defense Activities. All funding for research and development and landlord activities for the Idaho National Laboratory is requested in the Nuclear Energy account. Funding for Idaho Safeguards and Security is requested within Other Defense Activities. Within the two accounts, DOE is requesting a total of $852.5 million for NE activities in FY 2012.

PROGRAM DESCRIPTION

NE focuses on research and development of nuclear energy generation, security, materials, systems, safety, and waste management technologies and tools, and operates and maintains nuclear infrastructure in a safe and compliant manner to support achievement of national energy, climate, and non-proliferation goals. A key mission of DOE's nuclear energy program is to plan and conduct applied research in advanced reactor and fuel and waste management technologies. The aim of these efforts is to enable nuclear energy to be used as a safe, advanced, cost-effective source of reliable energy that will help address climate change by reducing greenhouse gas emissions.

The suite of technologies pursued by NE are designed to support the development of advanced reactor designs and technologies, including reactors that could be capable of meeting electricity generation, co-generation of process heat, and performance demands beyond current base load nuclear power plants and advanced fuel cycle technologies. This includes engaging in cost-shared activities with industry that may help accelerate commercial deployment of

small modular reactors. Additional activities in NE's programs will address barriers to the long-term operation of nuclear plants, as well as the technical, cost, safety, security and proliferation resistance issues associated with novel designs and innovative reactor concepts. A prominent influence on R&D direction again will be on improving our understanding of proliferation risks as well as developing the technical means to mitigate them.

PROGRAM HIGHLIGHTS

The FY 2012 request supports innovative applications of nuclear technology to develop new nuclear technologies, advanced proliferation-resistant nuclear fuel and waste management technologies, and maintains national nuclear capabilities to meet future challenges.

The **LWR SMR Licensing Technical Support** program ($67 million) supports design certification and licensing activities for Small Modular Reactors (SMR) through cost-shared arrangements with industry partners in order to accelerate deployment of SMRs to meet energy security and climate change goals.

The **Reactor Concepts RD&D** program ($125 million) supports research, development and demonstration for a diverse set of advanced fission power systems capable of producing electricity (MWe) and, in the case of the Next Generation Nuclear Plant (NGNP), co-generating process heat (BTUs) sustainably and economically. R&D activities in the program focus on advanced SMRs, the NGNP, and other advanced reactor concepts. Development of each reactor concept will seek to improve performance, economics, fuel cycle options, and safety.

The **Fuel Cycle R&D** program ($155 million) supports long-term, science-based research and development of nuclear fuel and waste management technologies that will enable a safe, secure, and economic fuel cycle. These long-term, science based efforts could enable beneficial changes to the way in which nuclear fuel and waste is managed.

The **Nuclear Energy Enabling Technologies** program ($97.4 million) investigates crosscutting technologies and transformative breakthroughs across a broad spectrum of areas with applicability to multiple reactor concepts and fuel cycle approaches. Crosscutting technology R&D will focus on a variety of areas such as reactor materials, creative approaches to further reduce proliferation risks, and establishing advanced modeling and simulation capabilities to complement physical experimentation. The Modeling and Simulation Energy Innovation Hub, supported within this program, will apply existing modeling and simulation capabilities to create a "virtual" reactor user environment to simulate an operating reactor and is a prime example of the type of crosscutting, transformative activity that will enhance many research areas within NE. In FY 2012, funding for the Advanced Test Reactor National Scientific User Facility (ATR NSUF) at the Idaho National Laboratory (INL) is included within this program. The Transformative Nuclear Concepts R&D activity will support, via an open, competitive solicitation process, investigator-initiated projects that relate to any aspect of nuclear energy generation including, but not limited to, reactor and power conversion technologies, fuels and fuel management, waste disposal, and nonproliferation to ensure that good ideas have sufficient outlet for exploration.

The **Radiological Facilities Management** program ($64.9 million) maintains important DOE nuclear technology facilities in a safe, secure, environmentally compliant and cost-effective manner. This includes $10 million, as part of a 50/50 cost share project with the National Aeronautics and Space Administration (NASA) reestablishing domestic capability to produce Plutonium (Pu)-238 for use in radioisotope power systems for NASA missions and national security applications. NASA uses Pu-238-based power systems where other power sources, such as batteries, fuel cells, and solar technologies, are not economical or technologically viable.

The **Idaho Facilities Management** program ($150 million) supports INL site-wide infrastructure used to ensure the Department's nuclear energy research and development facilities are maintained and operated to support national priorities. Key activities conducted under this program include ensuring that all NE facilities meet essential safety and environmental requirements, managing all special nuclear materials contained in these facilities.

The **Idaho Site-Wide Safeguards and Security** program ($98.5 million) protects DOE interests from theft, diversion, sabotage, espionage, unauthorized access, compromise, and other hostile acts, which could adversely impact national security, program continuity, the health and safety of INL employees, the public, or the environment.

Program Direction ($93.1 million) provides the federal staffing resources and associated costs required to provide overall direction and execution of the Department's Nuclear Energy program, including funding for oversight of Nuclear Waste Policy Act requirements.

The **International Nuclear Energy Cooperation** program ($3 million) helps ensure the safe and secure deployment of civilian nuclear power world-wide by supporting U.S. treaty obligations and other relevant U.S. international commitments in civilian nuclear energy matters.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Nuclear Power 2010 (FY 2010 $105.0; FY 2011 $0.0)..... -$101.9
Decrease reflects successful completion of the Nuclear Power 2010 program in FY 2010. The program was a joint government/industry cost-shared effort established in 2002 to demonstrate untested NRC regulatory and licensing processes.

Integrated University Program (FY 2010 $5.0; FY 2012 $0) ..... -$5.0
Decrease reflects the Administration's confidence that the nuclear industry, as it expands, will create incentives for students to enter nuclear-related programs.

LWR SMR Licensing Technical Support (FY 2010 $0; FY 2012 $67.0) ..... +$67.0
The Small Modular Reactor Deployment program will help accelerate design certification and licensing activities necessary for commercial deployment through a cost-shared arrangement with industry.

Reactor Concepts RD&D (FY 2010 $0; FY 2012 $125.0)..... +$125.0
The Reactor Concepts RD&D program will carry on activities previously funded under the Generation IV Nuclear Energy Systems program, including the Next Generation Nuclear Plant project, R&D on Generation IV and other advanced nuclear reactor concepts, and R&D to support extending the life of the current LWR fleet. In addition, program scope includes R&D on advanced SMR designs.

Fuel Cycle R&D (FY 2010 $131.9; FY 2012 $155.0) ..... +$23.1
Net increase reflects a shift toward longer-term, science-based R&D focused on waste storage and disposal options. R&D in fuel forms and fuel/waste management approaches will provide important information to inform future waste management decisions. This increase is offset by the consolidation of modeling and simulation activities within the NEET program.

Nuclear Energy Enabling Technologies (FY 2010 $0; FY 2012 $97.4)..... +$97.4
The Nuclear Energy Enabling Technologies program will develop cross cutting technologies and transformative breakthroughs across a broad spectrum of areas with applicability to multiple reactor concepts and fuel cycle approaches. Activities will be carried out through directed research projects, as well as through investigator-initiated projects to enhance many research areas within NE.

Radiological Facilities Management (FY 2010 $71.8; FY 2012 $64.9)..... -$6.9
Net decrease reflects completion of infrastructure activities at Oak Ridge National Laboratory and Los Alamos National Laboratory and one-time research reactor equipment and instrumentation upgrades at U.S. universities. These decreases are offset by increases for space and defense infrastructure to support escalation in operations and maintenance costs and to establish an enhanced safety analysis and testing program to help ensure the Department is able to continue launch safety certifications of new RPS technologies. Funds are also requested for reestablishment of Pu-238 production capability to support future NASA missions and potential national security applications and. The Pu-238 project will be 50/50 cost-shared with NASA.

Idaho Facilities Management (FY 2010 $172.7; FY 2012 $150)..... -$22.7
Decrease primarily reflects successful completion of the Idaho Facility Infrastructure Revitalization Program, the transfer of the ATR NSUF to the NEET program, and completion of one-time activities focused on the disposition of surplus non-radiological facilities. These decreases are offset by increases in reactor and non-reactor infrastructure costs associated with maintaining and enhancing INL's R&D facility testing and post-irradiation examination capabilities, as well as conducting additional regulatory compliance activities.

Idaho Sitewide Safeguards and Security (FY 2010 $83.4; FY 2012 $98.5) ..... +$15.1

Increase reflects escalation in costs associated with union contract negotiations and labor rate increases, as well as the one-time cost of replacing the sitewide video surveillance system, resulting in cost and performance efficiencies.

Program Direction (FY 2010 $73; FY 2012 $93.1) ..... +$20.1
Increase reflects additional funds necessary to support federal staffing resources for NE program activities and other costs associated with oversight of ongoing responsibilities under the Nuclear Waste Policy Act.

International Nuclear Energy Cooperation (FY 2010 $0; FY 2012 $3.0) ..... +$3.0
Increase reflects creation of a new program to support NE's engagement with officially approved international agreements and other relevant U.S. international commitments in civilian nuclear energy matters.

Fossil Energy

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Fossil Energy Research And Development	659,770	672,383	452,975	-206,795	-31.3%
Naval Petroleum & Oil Shale Reserves	23,627	23,627	14,909	-8,718	-36.9%
Strategic Petroleum Reserve	243,823	243,823	121,704	-122,119	-50.1%
Northeast Home Heating Oil Reserve	11,300	11,300	10,119	-1,181	-10.5%
Northeast Home Heating Oil Reserve Oil Sale	0	0	-79,000	-79,000	N/A
Total, Fossil Energy	**938,520**	**951,133**	**520,707**	**-417,813**	**-44.5%**

The **Office of Fossil Energy (FE)** manages Fossil Energy Research and Development and the Elk Hills School Lands Fund. FE also manages and operates the Strategic Petroleum Reserve, the Northeast Home Heating Oil Reserve, and the Naval Petroleum and Oil Shale Reserves. Each of these activities is in a separate appropriation account.

(dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Coal	393,485	0	291,358	-102,127	-26.0%
Natural Gas Technologies	17,364	0	0	-17,364	-100.0%
Unconventional Fossil Energy Technologies	19,474	0	0	-19,474	-100.0%
Program Direction	158,000	0	159,233	+1,233	+0.8%
Plant and Capital Equipment	20,000	0	16,794	-3,206	-16.0%
Fossil Energy Environmental Restoration	10,000	0	7,897	-2,103	-21.0%
Special Recruitment Programs	700	0	700	0	0%
Cooperative Research and Development	4,868	0	0	-4,868	-100.0%
Congressionally Directed Projects	35,879	0	0	-35,879	-100.0%
Subtotal, Fossil Energy Research and Development	***659,770***	***672,383***	***475,982***	***-183,788***	***-27.9%***
Use of Prior Year Balances	0	0	-23,007	-23,007	N/A
Total, Fossil Energy Research & Development	**659,770**	**672,383**	**452,975**	**-206,795**	**-31.3%**

PROGRAM DESCRIPTION

The mission of the **Fossil Energy Research and Development** (FER&D) program is to create technology and technology-based policy options having public benefit through enhancing U.S. economic, environmental, and energy security. This mission is achieved by developing technologies to enhance the clean use of domestic fossil fuels and to reduce emissions from fossil-fueled electricity generation plants to achieve near-zero atmospheric emissions power production, with specific focus on dramatic reductions of global carbon emissions at acceptable cost.

The **CCS Demonstration** program, including the Clean Coal Power Initiative (CCPI), FutureGen 2.0, and Industrial CCS Demonstrations funded by the Recovery Act, enables and accelerates the deployment of advanced carbon capture and storage (CCS) technologies to ensure clean, reliable, and affordable electricity for the United States. The three major component of the CCS Demonstration Program are cost-shared partnerships between the government

and industry to develop and demonstrate advanced coal-based power generation and industrial technologies at the commercial scale. The 2012 Budget request does not provide any demonstration funds because these projects are already strongly supported through the 2009 American Recovery and Reinvestment Act (ARRA).

The **Carbon Capture & Storage (CCS) and Power Systems** program directly supports the mission of FER&D by conducting and supporting long-term, high-risk R&D to significantly reduce coal power plant emissions (including CO_2) and substantially improve efficiency to reduce carbon emissions, leading to a viable near-zero atmospheric emissions coal energy system and supporting carbon capture and storage.

The **Carbon Capture** sub-program is focused on the development of post-combustion and pre-combustion CO_2 capture technologies for new and existing power plants. Post-combustion CO_2 capture technology is applicable to pulverized coal (PC) power plants, which is the current standard industry technology for coal-fueled electricity generation. Pre-combustion CO_2 capture is applicable to gasification-based systems such as IGCC, a potential technology for future generation of electricity from coal-fueled plants.

The **Carbon Storage** sub-program advances safe, cost effective, permanent geologic storage of CO_2. Activities in this area were previously funded under the Carbon Sequestration activities. The technologies developed and large-volume injection tests conducted through this sub-program will be used to benefit the existing and future fleet of fossil fuel power generating facilities by developing tools to increase our understanding of geologic reservoirs appropriate for CO_2 storage and the behavior of CO_2 in the subsurface. No funding is provided for reforestation or other terrestrial carbon sequestration.

The **Advanced Energy Systems** sub-program focuses on improving the efficiency of coal-based power systems, enabling affordable CO_2 capture, increasing plant availability, and maintaining the highest environmental standards. The program supports gasification-related R&D to convert coal into synthesis gas (syngas) that can in turn be converted into electricity chemicals, hydrogen, and liquid fuels . In addition, this sub-program advances hydrogen turbine designs to improve the performance of pre-combustion capture systems and supports the development of Advanced Combustion Systems through research focused on new high-temperature materials and the continued development of oxy-combustion technologies.

The **Cross-cutting Research** sub-program serves as a bridge between basic and applied research by fostering the development and deployment of innovative systems for improving efficiency and environmental performance through the research and development of instrumentation, sensors, and controls targeted at enhancing the availability of advanced power systems while reducing costs of Advanced CCS and Power Systems. This program area also develops computation, simulation, and modeling tools focused on optimizing plant design and shortening developmental timelines. The Cross-cutting Research activity also addresses advanced and crosscutting issues, including plant optimization technologies, environmental and technical/economic analyses, coal technology export, and integrated program support.

The **Natural Gas Technologies** R&D program developed technologies to produce gas hydrate resources. Consistent with Administration policy to phase out inefficient fossil fuel subsidies, the program is requesting no funding in FY 2012 for R&D to increase hydrocarbon production.

Strategic Petroleum Reserve

(dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Storage Facilities Development	199,732	0	170,914	-28,818	-14.4%
Expansion	25,000	0	0	-25,000	-100.0%
Management of SPR operations	19,091	0	21,790	+2,699	+14.1%
Use of Prior Year Balances	0	0	-71,000	-71,000	N/A
Total, Strategic Petroleum Reserve	**243,823**	**243,823**	**121,704**	**-122,119**	**-50.1%**

The **Strategic Petroleum Reserve** (SPR) provides strategic and economic security against foreign and domestic disruptions in oil supplies via an emergency stockpile of crude oil. The program fulfills U. S.

obligations under the International Energy Program, which avails the U.S. of IEA assistance through its coordinated energy emergency response plans, and provides a deterrent against energy supply disruptions. The FY 2012 budget proposes a SPR program that is fully responsive to the needs of the Nation and the public and is environmentally responsible. The FY 2012 budget provides for the management, maintenance, security and operational readiness of the SPR's oil storage and distribution facilities, the completion of replacement of a storage cavern at Bayou Choctaw, which poses a major environmental risk, and continues vapor pressure mitigation activities to ensure the availability of crude oil inventories at SPR sites within environmental and safety constraints. Program level of $192.7 million assumes cancellation of $71 million in balances from prior years appropriated for billion barrel expansion at Richton, MS site and use of these balances to partially fund required operations and management activities.

The FY 2012 budget proposes a $500 million non-emergency sale of SPR oil, and repeal of authorities related to the use of the Department of the Interior's royalty in-kind oil for the purpose of providing oil to the SPR.

Northeast Home Heating Oil Reserve

(dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Northeast Home Heating Oil Reserve	11,300	0	10,119	-1,181	-10.5%
Northeast Home Heating Oil Reserve Oil Sale	0	0	-79,000	-79,000	N/A
Total, Northeast Home Heating Oil Reserve	**11,300**	**11,300**	**-68,881**	**-80,181**	**-709.6%**

On July 10, 2000, the President directed DOE to establish a Northeast heating oil reserve which is capable of assuring a short-term supplement to private home heating oil supplies during times of very low inventories or in the event of significant threats to immediate energy supplies. The 2-million-barrel Reserve provides an emergency supply of supplemental heating oil for up to ten days, which is the time required for ships to carry heating oil from the Gulf of Mexico to New York Harbor. In FY 2011, new storage contracts will be awarded, and the program plans to sell 1,984,253 barrels of Heating Oil and use the receipts to purchase 1 million barrels of ultra low sulfur distillate (ULSD) to comply with the requirement to convert Heating Oil to ULSD to meet new state legislation. The FY 2012 budget request proposes cancellation of balances net of the FY 2011 sale and purchase (and other incidental costs).

Naval Petroleum and Oil Shale Reserves

(dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Production operations	14,166	0	5,480	-8,686	-61.3%
Management	9,461	0	9,429	-32	-0.3%
Total, Naval Petroleum & Oil Shale Reserves	**23,627**	**23,627**	**14,909**	**-8,718**	**-36.9%**

The **Naval Petroleum and Oil Shale Reserves** (NPOSR) will continue with environmental remediation activities and determination of equity finalization of NPR-1. Since production costs are expected to exceed oil revenues, production operations at NPR-3 are no longer economic and will be discontinued except for incidental oil production associated with produced water needed for geothermal testing at the Rocky Mountain Oil Center. Geothermal testing will be limited to 100% funds-in projects and those projects wholly funded by EERE's Geothermal

Technology Program. Environmental remediation will be performed on those facilities that no longer have value to the geothermal testing mission. A plan will be developed for the sale or disposition of NPR-3.

Since the NPOSR no longer served the national defense purpose envisioned in the early 1900s, the National Defense Authorization Act for FY 1996 (P.L. 104-106) required the sale of the government's interest in Naval Petroleum Reserve No. 1 (NPR-1). To comply with this requirement, the Elk Hills field in California was sold to Occidental Petroleum Corporation in 1998, two of the Naval Oil Shale Reserves (NOSR-1 and NOSR-3) were transferred to the Department of the Interior's (DOI) Bureau of Land Management, and the NOSR-2 site was returned to the Northern Ute Indian Tribe. The Energy Policy Act of 2005 transferred administrative jurisdiction and environmental remediation of Naval Petroleum Reserve 2 (NPR-2) in California to the Department of the Interior, except for eight small unused drill sites in Ford City. DOE retains the Naval Petroleum Reserve No. 3 (NPR-3) in Wyoming (Teapot Dome field).

PROGRAM HIGHLIGHTS

Fossil Energy Research and Development - Coal activities include research, development and demonstration of technologies that will improve the competitiveness of near-zero emissions coal-fueled electricity generation in future energy supply markets through technologies that cost-effectively capture and store CO_2, providing a domestic, low-cost, low-CO_2 energy supply option.In FY 2012 and through the Recovery Act, the Coal program continues aggressive funding for CCS activities, including large-scale demonstration of injection and storage of CO_2 in geologic formations through the Regional Carbon Sequestration Partnerships and large-scale demonstration of carbon capture technologies through selected Clean Coal Power Initiative and Industrial CCS demonstration projects.

Strategic Petroleum Reserve - The FY 2012 budget request maintains the operational readiness of the SPR to ensure a 4.4 MMB/Day drawdown rate. The SPR program is environmentally responsible and fully responsive to the needs of the Nation and the public. The FY 2012 budget includes funding to continue activity toward completion of physical construction of the Bayou Choctaw replacement cavern and for degas operations to begin at the West Hackberry site.

Northeast Home Heating Oil Reserve - The FY 2012 budget request continues operation of the Reserve, including lease of commercial storage space.

Naval Petroleum and Oil Shale Reserves- In FY 2012, the NPOSR program will continue Elk Hills environmental closeout efforts plus activities related to the settlement of ownership equity shares with the former unit partner in the NPR-1 field, Chevron U.S.A., Inc. The Department of Energy is currently in mediation with Chevron U.S.A. to settle the NPR-1 equity. If mediation fails, the Federal Judge will likely proceed with her decision. Since production costs are expected to exceed oil revenues, production operations at NPR-3 are no longer economic and will be discontinued except for incidental oil production associated with produced water needed for geothermal testing. A plan will be developed for the sale or disposition of NPR-3. The Rocky Mountain Oilfield Testing Center co-located at NPR-3 will provide opportunities through 100% funds-in agreements and fully funded EERE projects for field testing and demonstration of low-temperature geothermal technologies and other renewable energy technologies having oilfield applications. Environmental remediation will be performed on those facilities that no longer have value to the geothermal testing mission. Oil production from NPR-3 is expected to average about 40 barrels per day provided that EERE funds geothermal testing.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to 2012 Request ($ in millions)

Fossil Energy Research and Development

Carbon Capture & Storage (CCS) and Power Systems

Carbon Capture (FY 2010 $50.0; FY 2012 $68.9) …… +$18.9

The increase in funding ($22.4) for *Post-Combustion* will fund slip stream testing of a larger number of advanced technology systems and will shorten the time required for development of systems ready for commercial application while the decrease in funding (-$2.2) for *Pre-Combustion Capture Systems* represents program prioritization on post-combustion capture technology development.

Carbon Storage FY 2010 $134.4; FY 2012 $115.5) …….. -$18.9

An increase in funding ($7.0) for the Regional Carbon Sequestration Partnerships validation and development field projects ensures that the projects can maintain their schedule for completing site characterization and injection operations.

The decrease in funding: (-$16.2) for *Geological Storage* maintains existing project activities and shifts support to the Regional Carbon Sequestration Partnerships validation and development field projects to ensure these projects maintain their schedule for completing site characterization and injection operations; (-$2.9) for *Monitoring, Verification, Accounting and Assessment* (-$2.8) *Carbon Use and Reuse*; and (-$3.9) for the *Focus Area for Carbon Sequestration Science*, will maintain existing project activities and ensures efforts focus on the Regional Sequestration Partnerships.

Advanced Energy Systems (FY 2010 $181.8; FY 2012 $64.2) …….. -$117.6

Advanced Combustion Systems (FY 2010 $20.5; FY 2012 $10.7) ..... ……. -$9.8

The requested funding level is sufficient to support current R&D efforts related to work conducted under Pre-Combustion Capture. The decrease in funding represents the shift in focus toward technologies that have potential benefits to both existing and new fossil-fueled power plants.

Gasification Systems (FY 2010 $57.1; FY 2012 $38.9) ……. -$18.2

The decrease in funding represents the shift in focus toward technologies that have potential benefits to both existing and new fossil-fueled power plants. In addition, recently obligated Recovery Act funding will ensure that development of gasification technologies will continue to advance on or ahead of schedule.

Hydrogen Turbines (FY 2010 $31.2; FY 2012 $14.6)……. -$16.6

The decrease in funding represents the shift in focus toward technologies that have potential benefits to both existing and new fossil-fueled power plants. In addition, recently obligated Recovery Act funding will ensure that development of hydrogen turbine technologies will continue to advance on or ahead of schedule.

Hydrogen from Coal (FY 2010 $17.3; FY 2012 $0.0)…..…….-$17.3

The decrease in funding represents the shift in focus toward technologies that have potential benefits to both existing and new fossil-fueled power plants. In addition, recently obligated Recovery Act funding will ensure that development of gasification technologies will continue to advance on or ahead of schedule.

Coal to Coal Biomass to Liquids (FY 2010 $7.0; FY 2012 $0.0)…….-$7.0)

No new activities are planned.

Solid Oxide Fuel Cells (FY 2010 $48.7; FY 2012 $0.0) ……. - $48.7

SECA Core Technology R&D will complete existing work - no new Core Technology effort shall be initiated in 2012.

Crosscutting Research (FY 2010 $27.3; FY 2012 $42.8) …… $15.5

The increase in funding computational modeling and simulations will support efforts to develop a defensible, science-based quantitative methodology for determining risk profiles at carbon dioxide (CO_2) storage sites, and enable the develop and deploy state-of-the-art computational modeling and simulation tools to accelerate the commercialization of carbon capture technologies. Decreases in (-$1.9) in *Fine Particulate control/Air Toxics* and (-$3.9) in *By Products/Water Management* will result in no new activities.

Natural Gas Technologies (FY 2010 $17.4; FY2012 $0.0)……..- $17.4

Consistent with Administration policy to phase out inefficient fossil fuel subsidies, the program is requesting no funding in FY 2012 for R&D to increase hydrocarbon production.

Unconventional Fossil Energy Technologies (FY 2010 $19.5 ; FY 2012 0.0)…….. -$19.5

Consistent with Administration policy to phase out inefficient fossil fuel subsidies, the program is requesting no funding in FY 2012 for R&D to increase hydrocarbon production..

Program Direction (FY 2010 $158.0; FY 2012 $159.2) .....…..+$1.2

The increase in funding for salaries and benefits is due to promotions, within grade increases, performance awards, health care costs, and other related costs. This increase is also due to increased costs in the Working Capital Fund,

such as, costs related to telecommunications, procurement management, iManage, financial statements, and etc. A pay freeze reduction as well as administrative savings was applied to Program Direction.

Cooperative Research and Development (FY 2010 $4.9; FY 2012 $0.0) .....-$4.9
In FY 2012, the Department anticipates that these centers will compete successfully for Fossil Energy funding through the competitive solicitation process.

Congressionally Directed Projects (FY 2010 $35.9; FY 2012 $0.0).....-$35.9
No Congressionally Directed Projects were requested for the FY 2012 Budget.

Strategic Petroleum Reserve

Strategic Petroleum Reserve (FY 2010 $243.8; FY 2012 $121.7).....-$122.1
The decrease assumes cancellation of $71 million in balances from prior year appropriations for a billion barrel expansion at Richton, MS site and the use of these balances to partially fund operations and management activities. Program decrease is attributable to degas site modification construction at West Hackberry that occurred in FY 2010; reduced costs associated with the Bayou Choctaw replacement cavern; a reduction in power charges; and, due to no funding being requested for Expansion.

Innovative Technology Loan Guarantee Program

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Title 17 - Innovative Technology Loan Guarantee Program					
Administrative Operations	26,000	43,000	38,000	+12,000	+46.2%
Administrative Operations, Offsetting Collections	-26,000	-58,000	-38,000	-12,000	-46.2%
Cost of Loan Guarantees	0	0	200,000	+200,000	N/A
Section 1705 Temporary Loan Guarantee Program					
Administrative Operations	17,000	0	0	-17,000	-100.0%
Administrative Operations, Offsetting Collections	-17,000	0	0	+17,000	+100.0%
Total, Innovative Technology Loan Guarantee	**0**	**-15,000**	**200,000**	**+200,000**	**N/A**

PROGRAM DESCRIPTION

The **Loan Guarantee Program Office** (LGPO) coordinates Departmental action on all loan guarantee applications submitted to the Department of Energy in compliance with Title XVII of the Energy Policy Act of 2005 (EPAct05). Section 1703 of that Act authorizes the Department to provide loan guarantees for innovative clean energy projects in categories including renewable energy systems, advanced nuclear facilities, coal gasification, carbon sequestration, energy efficiency, and various other types of projects. These projects must avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; employ new or significantly improved technologies compared to commercial technologies in service in the United States at the time the guarantee is issued; and offer a reasonable prospect of repayment of the principal and interest on the guaranteed obligation.

Section 406 of the American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5 (Recovery Act), amended the LGPO's authorizing legislation, by establishing Section 1705, a temporary program for the rapid deployment of renewable energy and electric power transmission projects. The authority to enter into loan guarantees under Section 1705 expires on September 30, 2011.

The decision to issue loan guarantees depends on the merits and benefits of particular project proposals and their compliance with statutory and regulatory requirements.

The Loan Guarantee Program Office will ensure all processes and criteria are applied uniformly in accordance with established requirements, procedures and guidelines. The projects supported by this program will complement and encourage industry efforts to bring more advanced technologies into the marketplace.

PROGRAM HIGHLIGHTS

The FY 2012 request supports additional loan guarantees for innovative renewable and energy efficiency projects and nuclear power projects. For renewable energy systems and efficient end-use energy technology projects, the Department is requesting $200 million in credit subsidy to support an estimated $1 to $2 billion in loan guarantees. These funds will stimulate investment in a range of promising, innovative technologies. The Department also requests up to $36 billion in loan guarantee authority for nuclear power projects. This additional authority will support the deployment of advanced nuclear technology and overcome some of the current barriers to financing new nuclear power projects, thereby clearing the way to affordable private sector financing.

As of January 2011, the DOE Title XVII Loan Guarantee Program has awarded conditional commitments or closings to 18 projects totaling over $17.6 billion in the following sectors:

- Solar generation: three projects totaling $3.8 billion in loans
- Solar manufacturing: two projects totaling $935 million in loans
- Wind generation: two projects totaling $1.4 billion in loans
- Wind manufacturing: one project with a $16 million loan
- Geothermal: two projects totaling $200 million in loans
- Transmission and Energy Storage: three projects totaling $409 million in loans
- Biofuels: one project with a $241 million loan
- Energy efficiency: two projects totaling $317 million in loans
- Nuclear power facilities: one project with a $8.3 billion loan
- Front-end nuclear facilities: one project with a $2 billion loan

Current loan authority to support Section 1703 eligible projects totals $51 billion divided as follows: $18.5 billion for renewable projects, $18.5 billion for nuclear power projects, $4 billion for front-end nuclear projects, $8 billion for advanced fossil projects, and $2 billion for undesignated technologies. In addition, $2.4 billion in appropriated credit subsidy is available to support Section 1705 eligible projects.

The Department requests $38 million in funding in FY 2012 for administrative expenses to operate the office and support personnel and associated costs. This request is expected to be offset by collections from borrowers authorized under the EPAct05.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to 2012 Request ($ in millions)

Loan Guarantee Program Office (FY 2010 $0.0; FY 2012 $200.0) ..... +$200.0

Sec. 1703 Cost of Loan Guarantees (FY 2010 $0.0; FY 2012 $200.0)……..….+$200.0
The request for Section 1703 appropriated credit subsidy for efficiency and renewable projects will provide funding to continue the support of innovative renewable energy and energy efficiency projects with the expiration of the Section 1705 program in 2011.

Nuclear Power Loan Authority (FY 2010 $0.0; FY 2012 $0.0)……+$0.0
The Department requests up to $36 billion in additional loan guarantee authority for nuclear power projects to promote deployment of new nuclear power plants in support of clean energy goals and demonstrate factors responsible for financing risk premiums are manageable. The request shall be reduced by any amounts provided for nuclear power facilities prior to enactment of 2012 appropriations to result in cumulative loan guarantee authority for nuclear power projects of $54.5 billion.

Administrative Operations (FY 2010 $43; FY 2012 $38) ..... -$5.0
Administrative Operations provides the Federal staffing and contractor resources and associated costs required to provide overall direction and execution of the Innovative Technology Loan Guarantee Program including loan origination, portfolio management, legal, technical, and other operational activities. The decrease in funding is due to the expiration of the Section 1705 program in 2011.

Offsetting Collections (FY 2010 -$43; FY 2012 -$38)..... +$5.0

Better Building Pilot Loan Guarantee Initiative for Universities, Schools, & Hospitals

(dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Cost of Loan Guarantees	0	0	100,000	+100,000	N/A
Administrative Operations	0	0	5,000	+5,000	N/A
Total, Better Building Pilot Loan Guarantee Initiative For Universities, Schools & Hospitals	**0**	**0**	**105,000**	**+105,000**	**N/A**

PROGRAM DESCRIPTION

The Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools, and Hospitals is intended to provide funds for cost-effective technologies and measures, and to help catalyze the emerging industry for commercial building retrofits. Once authorized, DOE would design program regulations outlining terms and conditions for issuing loan guarantees under the program. The decision to issue any specific loan guarantee will depend on the merits and benefits of particular project proposals and their compliance with statutory and regulatory requirements.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to 2012 Request ($ in millions)

Better Buildings Pilot Loan Guarantee Initiative for Universities, Schools, and Hospitals (FY 2010 $0.0 FY 2012 $105) ..... +$105.0

Cost of Loan Guarantees (FY 2010 $0.0; FY 2012 $100)…….+$100.0
The request for appropriated credit subsidy will support loans for energy efficiency retrofits of universities, hospitals, and schools, to remain available until expended. The appropriated funds are available to subsidize up to $2 billion in total loan principal, any part of which may be guaranteed.

Administrative Operations (FY 2010 $0.0; FY 2012 $5)……+$5.0
Administrative operations provides the Federal staffing and contractor resources and associated costs required to provide overall direction and execution of the Better Buildings Pilot Loan Guarantee Initiative.

Advanced Technology Vehicle Manufacturing Loan Program

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Administrative Expenses	20,000	20,000	6,000	-14,000	-70.0%
Total, Advanced Technology Vehicles Manufacturing Loan	**20,000**	**20,000**	**6,000**	**-14,000**	**-70.0%**

PROGRAM DESCRIPTION

Section 136 of the Energy Independence and Security Act of 2007 establishes an incentive program consisting of both grants and direct loans to support the development of advanced technology vehicles and associated components in the United States. The Department of Energy (DOE) is charged with administering the section 136 program, known as the Advanced Technology Vehicles Manufacturing Loan Program (ATVM).

Under section 136, the ATVM Loan Program provides loans to automobile and automobile part manufacturers for the cost of re-equipping, expanding, or establishing manufacturing facilities in the United States to produce advanced technology vehicles or qualified components, and for associated engineering integration costs.

As required by the Federal Credit Reform Act of 1990, this account records, for this program, the subsidy costs associated with the loan guarantees committed in 1992 and beyond (including modifications of direct loans or loan guarantees that resulted from obligations or commitments in any year), as well as administrative expenses of this program. The subsidy amounts are estimated on a present value basis; the administrative expenses are estimated on a cash basis.

The ATVM Loan Program will help ensure that new advanced technology vehicles meet a higher standard (125% of the base year[2] CAFE fuel efficiency standards) than similarly classed conventional technology vehicles.

PROGRAM HIGHLIGHTS

As of January 2011, the ATVM Loan Program has awarded five conditional loan commitments or closings totaling $8.4 billion to date. The loans include $5.9 billion for Ford Motor Company to transform factories across Illinois, Kentucky, Michigan, Missouri, and Ohio to produce 13 more fuel efficient models; $1.4 billion to Nissan North America, Inc. to retool their Smyrna, Tennessee factory to build advanced electric automobiles and to build an advanced battery manufacturing facility; $465 million to Tesla Motors to manufacture electric drive trains and electric vehicles in California; $50 million to Tenneco, Inc. to develop fuel efficient emission control components for advanced technology vehicles; and $529 million to Fisker Automotive for the development of two lines of plug-in hybrids; and $50 million to The Vehicle Production Group, LLC for development of a six-passenger a factory-built wheelchair accessible vehicle.

The Department requests $6 million in funding in Fiscal Year (FY) 2012 to operate the office and support personnel and associated costs. DOE is not seeking additional appropriations for credit subsidy costs in FY 2012.

[2] The interim final rule for the program, promulgated on November 12th, 2008, set the base year for this requirement as the model year 2005. The final rule has not yet been promulgated.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to 2012 Request ($ in millions)

Advanced Technology Vehicle Manufacturing Loan Program (FY 2010 $20.0; FY 2012 $6.0)……-$14.0

Administrative Expenses ..... -$14.0
The program plans to transition from loan origination to portfolio management activities in FY 2012.

National Nuclear Security Administration

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2012 Cong. Request	FY 2012 vs. FY 2011	
				$	%
Weapons Activities	6,386,371	7,008,835	7,629,716	+620,881	+8.9%
Defense Nuclear Nonproliferation	2,131,382	2,687,167	2,549,492	-137,675	-5.1%
Naval Reactors	945,133	1,070,486	1,153,662	+83,176	+7.8%
Office of the Administrator	410,754	448,267	450,060	+1,793	+0.4%
Total, National Nuclear Security Administration	**9,873,640**	**11,214,755**	**11,782,930**	**+568,175**	**+5.1%**

PROGRAM DESCRIPTION

The **National Nuclear Security Administration (NNSA)** is critical to ensuring the security of our nation. The NNSA implements programs for three major national security endeavors: leveraging science to maintain a safe, secure and effective arsenal of nuclear weapons and capabilities to deter any adversary and guarantee that defense to our allies; accelerating and expanding our efforts here in the homeland and around the world to reduce the global threat posed by nuclear weapons, nuclear proliferation and unsecured or excess nuclear materials; and, providing safe and effective nuclear propulsion for the United States Navy.

PROGRAM HIGHLIGHTS

NNSA is requesting a total of **$11.8 billion** in **FY 2012**, an increase of **$568 million** over the FY 2011 Request. NNSA is requesting program funds in four appropriation accounts: **Weapons Activities** (FY 2011 $7,008.8 million; FY 2012 $7,629.7 million); **Defense Nuclear Nonproliferation** (FY 2011 $2,687.2 million; FY 2012 $2,549.5 million); Naval Reactors (FY 2011 $1,070.5 million; FY 2012 $1,153.7 million), and **Office of the Administrator** (FY 2011 $448.3 million; FY 2012 $450.1 million).

The **Weapons Activities** request reflects a multi-year increase necessary to meet the President's policy direction and commitments in the Nuclear Posture Review Report to be jointly implemented by DOE and DoD. Increased funding supports the nuclear weapon stockpile management program, the scientific, technical and engineering activities supporting the stockpile and broader national security objectives, and critical major infrastructure improvements. The **Defense Nuclear Nonproliferation** request is driven by the imperative for U.S. leadership in nonproliferation initiatives both here and abroad. Emphasis continues to be on efforts to secure vulnerable nuclear materials around the world, and domestic construction on the MOX Fuel Fabrication Facility and the design and construction of two major supporting facilities. The **Naval Reactors** request reflects increases required to support reactor plant development for the OHIO class replacement submarine, refueling of the Land-Based prototype, and Spent Fuel Infrastructure. For **Office of the Administrator,** the request supports the staffing and Federal support needed to meet requirements in the programs.

The FY 2012-2016 President's Request for the NNSA is a funding increase over the FY 2011 President's Request, reflecting the importance of the Presidential priorities in meeting the objectives of the Nuclear Posture Review, cooperative global nuclear nonproliferation, needed modernization of the nuclear complex, and the reactor design and development activities for the Navy's nuclear fleet. NNSA is a key player in the implementation of the President's vision to reduce the role of nuclear weapons in U.S. national security strategy. NNSA will further this goal by maintaining a safe, secure and effective arsenal to deter any adversary until the ultimate goal of a world without nuclear weapons can be realized, as envisioned in the President's April 2009 Prague speech. NNSA will enable an evolving strategic posture where stewardship, nonproliferation, counterterrorism efforts, missile defense, and arms control objectives are integrated into one comprehensive strategy.

Weapons Activities – NNSA

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2012 Cong. Request	FY 2012 vs. FY 2011	
				$	%
Directed Stockpile Work	1,564,290	1,898,379	1,963,583	+65,204	+3.4%
Science Campaign	294,548	365,222	405,939	+40,717	+11.1%
Engineering Campaign	149,679	141,920	143,078	+1,158	+0.8%
Inertial Confinement Fusion and High Yield Campaign	457,486	481,548	476,274	-5,274	-1.1%
Advanced Simulation and Computing Campaign	566,069	615,748	628,945	+13,197	+2.1%
Readiness Campaign	106,744	112,092	142,491	+30,399	+27.1%
Readiness in Technical Base and Facilities	1,810,279	1,848,970	2,326,134	+477,164	+25.8%
Secure Transportation Asset	240,683	248,045	251,272	+3,227	+1.3%
Nuclear Counterterrorism Incident Response	223,379	233,134	222,147	-10,987	-4.7%
Facilities and Infrastructure Recapitalization Program	95,575	94,000	96,380	+2,380	+2.5%
Site Stewardship	63,308	105,478	104,002	-1,476	-1.4%
Safeguards and Security	893,161	844,299	849,471	+5,172	+0.6%
National Security Applications (*formerly, Science, Technology and Engineering Capability*)	0	20,000	20,000	0	0%
Congressionally Directed Projects	3,000				
Subtotal, Weapons	***6,468,201***	***7,008,835***	***7,629,716***	***+620,881***	***+8.9%***
Use of Prior Year Balances	-81,830	0	0	0	0%
Total, Weapons Activities	**6,386,371**	**7,008,835**	**7,629,716**	**+620,881**	**+8.9%**

PROGRAM DESCRIPTION

One of the statutory missions of the National Nuclear Security Administration (NNSA) is to maintain and enhance the safety, security, and reliability of the U.S. nuclear weapons stockpile to meet national security requirements. The mission is carried out in partnership with the Department of Defense (DoD), with NNSA providing research, development, and production activities supporting the U.S. nuclear weapons stockpile.

The **Weapons Activities** request for FY 2012 is $7.63 billion, an increase of $620.9 million above the FY 2011 funding request. The main components of the Weapons Activities budget request are listed below. Program Direction activities, except for Secure Transportation Asset, are funded in a separate appropriation under the Office of the Administrator account.

Directed Stockpile Work (DSW) activities provide for the Stockpile Management program that ensures the operational readiness of the nuclear weapons in the nation's stockpile through maintenance, surveillance, evaluation, refurbishment, reliability assessment, weapon dismantlement and disposal, research, development, and certification activities. The request is organized by Life Extension Programs (LEPs), Stockpile Systems, Weapons Dismantlement and Disposition, and Stockpile Services.

Campaigns are focused on maintaining capabilities to support the scientific and technical efforts essential for the certification, maintenance and life extension of the stockpile. The NNSA supports the science, technology and engineering required to maintain a safe, secure and reliable stockpile without underground nuclear testing. These dual goals are accomplished by the NNSA pursuing a "science-based" certification and assessments process which relies on surveillance, experiments, modeling, simulation, and historical test data. The Science Campaign develops improved capabilities to assess the safety, reliability, and performance of the nuclear package portion of weapons without further underground nuclear testing. The Engineering Campaign develops capabilities to assess and improve the safety, reliability, and performance of the non-nuclear and nuclear explosive package engineering components in nuclear weapons. The Inertial Confinement Fusion Ignition and High Yield Campaign develops laboratory capabilities to create and measure laboratory thermonuclear ignition, which will provide critical scientific data to support the stockpile without underground nuclear testing. The Advanced Simulation and Computing Campaign provides leading edge, high end simulation capabilities to meet weapons assessment and certification requirements, including weapon codes, weapons science, platforms, and computer facilities. The Readiness Campaign has the responsibility for development and deployment of modern manufacturing capabilities to produce materials and components in compliance with weapon design and performance requirements, and in accordance with life extension program and refurbishment schedules.

Readiness in Technical Base and Facilities (RTBF) supports the underlying physical infrastructure and operational readiness required to conduct the Stockpile Management program and science, technology and engineering activities at the eight NNSA sites: three national weapons laboratories, four production sites, and the Nevada National Security Site. RTBF funding is allocated to ensure that these government-owned, contractor-operated facilities are operational, safe, secure, compliant with regulatory requirements, and able to sustain a defined level of readiness to execute the large variety of activities tasked to the nuclear security enterprise. RTBF also plans, prioritizes, and constructs state-of-the-art facilities, infrastructure, and scientific tools for the enterprise within approved baseline costs and schedule.

Secure Transportation Asset provides for the safe, secure movement of nuclear weapons, special nuclear materials, and weapon components to meet projected DOE and DoD requirements. The Program Direction in this account provides for the Federal Agents and the secure transportation workforce.

Nuclear Counterterrorism Incident Response (NCTIR) funding provides for emergency management and response activities that ensure a central point of contact and integrated response to emergencies requiring DOE assistance. It also provides program funding for Render Safe Research and Development, National Technical Nuclear Forensics, Stabilization and Implementation, International Emergency Management and Cooperation and Nuclear Counterterrorism activities.

Facilities and Infrastructure Recapitalization Program (FIRP) continues to fulfill its commitments to restore, rebuild, and revitalize the physical infrastructure of the nuclear security enterprise. FIRP addresses an integrated, prioritized list of maintenance and infrastructure projects, separate yet complementary to maintenance and infrastructure efforts under RTBF, in order to increase the operational efficiency of the NNSA sites through targeted reduction of deferred maintenance and restoration of key facilities**.**

Site Stewardship ensures environmental compliance and energy and operational efficiency throughout the nuclear security enterprise. It encompasses environmental projects, nuclear materials integration, energy modernization and stewardship-related line item construction projects.

Defense Nuclear Security provides protection for NNSA personnel, facilities, nuclear weapons and information from a full spectrum of threats, most notably from terrorism attacks in the United States.

Cyber Security provides the guidance needed to adequately protect information assets and ensure that sufficient information technology and information management security safeguards are implemented throughout the NNSA enterprise.

National Security Applications (formerly Science, Technology and Engineering Capability) supports leadership in science and technology to serve national security needs by making strategic technical investments which utilize the science, technology and engineering capabilities and infrastructure of the national security enterprise.

PROGRAM HIGHLIGHTS

The FY 2012 request continues significant efforts to meet nuclear security priorities, to conduct the Stockpile Management program, and to leverage science to enhance national security. The investment strategy in this budget request provides a strong basis for transitioning to a smaller nuclear stockpile that continues to be safe, secure and effective. This request strengthens the science, technology and engineering base, modernizes key nuclear facilities, and streamlines the enterprise's physical and operational footprint. These investments are critical in order to strengthen the nation's security while supporting a reduced reliance on nuclear weapons and to bolster confidence in the ability to certify the stockpile under a Comprehensive Test Ban Treaty (CTBT). Targeted increases are therefore provided for Stockpile Support, Science Technology and Engineering, and Infrastructure.

The increase in *Stockpile Support* provides for the Stockpile Management program. It meets current commitments to DoD through the W76 LEP and support for the expected Nuclear Weapons Council (NWC) authorization for B61 Phase 6.3 Development Engineering LEP. This budget will also increase support for current systems, including significant efforts in weapon surveillance, certification and production activities, while continuing to dismantle retired systems.

The support for *Science, Technology and Engineering* is crucial to provide the technical and scientific basis to ensure that the nation's nuclear weapons are safe, secure and reliable, without the use of underground nuclear testing. The budget supports increases for the science necessary for certification, including the work toward ignition at the National Ignition Facility and the computational and simulation capability which are essential to supporting the CTBT.

Infrastructure and construction support in the budget request is targeted toward maintaining and improving current infrastructure and support, increased support for nuclear material consolidation, and construction of replacement plutonium research and uranium manufacturing and waste facilities.

The *Safeguards and Security* budget continues to provide protection in the areas of physical and cyber security from a full spectrum of threats. The physical security budget is based on risk-informed decisions and is fully consistent with the Department's Graded Security Protection policy. The corresponding increase in the cyber budgets continues support for emerging threats in those areas.

SIGNIFICANT FUNDING CHANGES – FY 2011 Request to FY 2012 Request ($ in millions)

Weapons Activities (FY 2011 $7,008.8; FY 2012 $7,629.7) ..... +$620.9
FY 2012 request is $620.9 million above the FY 2011 request.

Directed Stockpile Work (FY 2011 $1,898.4; FY 2012 $1,963.6) ..... +$65.2
FY 2012 request is 3.4 percent above the FY 2011 level. The NNSA will continue the Stockpile Management program to meet the immediate needs of the stockpile, enhance stockpile surveillance, and continue annual assessment and Life Extension Programs.

Life Extension Programs (FY 2011 $249.5; FY 2012 $480.6). FY 2012 request is $231.1 or 92.7 percent above the FY 2011 level. The increase represents a transfer of funding from Stockpile Systems for the B61-12 to coincide with the expected NWC Phase 6.3 approval in FY 2012.

Stockpile Systems (FY 2011 $649.4; FY 2012 $497.6). FY 2012 request is $151.7 or 23.4 percent below the FY 2011 level. The decrease is associated with a transfer of funding to the Life Extension Program for the B61-12 to coincide with the expected Nuclear Weapons Council (NWC) Phase 6.3 approval in FY 2012. Funding is also provided for a study to evaluate future options and approaches to maintaining the W78, consistent with the principles of the Stockpile Management Program. The study will also will consider the possibility of developing a common warhead that will include the W88 platform. Surveillance efforts are enhanced, including a wide range of laboratory tests and component and material testing to provide critical state-of-health data for annual assessment to certify the stockpile without underground nuclear testing.

Weapons Dismantlement and Disposition (FY 2011 $58.0; FY 2012 $56.8). FY 2012 request is $1.3 or 2.2 percent below the FY 2011 level. The decrease reflects a reduced characterization and disposition of legacy weapon components and component disposition of on-going dismantlement activity.

Stockpile Services (FY 2011 $941.5; FY 2012 $928.6). FY 2012 request is $12.9 or 1.4 percent below the FY 2011 level. The decrease reflects the completion of the W88 pit build and NPR-driven changes in mission scope. It is partially offset by increases for neutron generator and detonator manufacturing and to complete multi-system surveillance requirements.

Campaigns (FY 2011 $1,716.5; FY 2012 $1,796.7)..... +$80.2
FY 2012 request is 4.7 percent above the FY 2011 level.

Science Campaign (FY 2011 $365.2; FY 2012 $405.9). FY 2012 request is $40.7 or 11.1 percent above the FY 2011 level. Increased emphasis is placed on Advanced Certification and Dynamic Material Properties, which will support the National Boost Initiative. The request accelerates dynamic Pu experiments that support scaling/surrogacy, quantification of the effects of surety features and investigation of efficacy options.

Engineering Campaign (FY 2011 $141.9; FY 2012 $143.1). FY 2012 request is $1.2 or 0.8 percent above the FY 2011 level. The increase reflects the need for validation-related testing required for the B61 LEP and future refurbishments.

Inertial Confinement Fusion Ignition and High Yield Campaign (FY 2011 $481.5; FY 2012 $476.3). FY 2012 request is $5.3 or 1.1 percent below the FY 2011 level. The request contains a significant decrease in Diagnostics, Cryogenics, and Experimental Support after the installation of diagnostic equipment at NIF. The decrease is offset by increases for target research and development.

Advanced Simulation and Computing Campaign (FY 2011 $615.7; FY 2012 $628.9). FY 2012 request is $13.2 or 2.1 percent above the FY 2011 level, and will provide for growth in Physics and Engineering models address critical skill shortfalls at the laboratories to provide foundational simulation capabilities needed for future LEPs, significant findings investigations and a CTBT environment.

Readiness Campaign (FY 2011 $112.1; FY 2012 $142.5). FY 2012 request is $30.4 or 27.1 percent above the FY 2011 level. The increase supports irradiation fees and reactor fuel to operate the capability for producing tritium required for the nuclear weapons stockpile and the maturation of manufacturing technologies associated with the arming, fusing, and firing component assembly, joint test assemblies telemetry, detonators, switches, and radars associated with the B61 LEP.

Readiness in Technical Base and Facilities (FY 2011 $1,849.0; FY 2012 $2,326.1) .... +$477.2
FY 2012 request is 25.8 percent above the FY 2011 level.

Operations of Facilities (FY 2011 $1,258.0; FY 2012 $1,485.3). FY 2012 request is $227.3 or 18.1 percent above the FY 2011 level. Operates and maintains NNSA-owned programmatic capabilities in a state of readiness, ensuring each capability (workforce and facility) is operationally ready to execute identified programmatic tasks. Approximately $318.5 is requested for the Los Alamos National Laboratory (no change), $246.0 for the Y-12 complex (+11.3 percent), $120.7 for the Sandia National Laboratory (+2.8 percent), $156.2 for the Kansas City Plant (-16.1 percent), $84.0 for the Lawrence Livermore National Laboratory (+4.8 percent), $164.8 for the Pantex Plant (+36.0 percent), $97.8 for the Savannah River Site (+5.4 percent), $97.6 for the Nevada National Security Site (+21.8 percent), and $199.6 for Institutional Site Support (ISS) (+387.3 percent). The increase for ISS reflects $168.2 for required University of California pension payments. The increase for Pantex adjusts funding to meet required minimum-operational levels. The Nevada increase supports the full suite of Stockpile Stewardship mission requirements while concurrently maintaining experimental capabilities.

Program Readiness (FY 2011 $69.3; FY 2012 $74.2). FY 2012 request is $4.9 or 7.0 percent above the FY 2011 level. It supports the Nuclear Criticality Safety Program's collaboration with France to begin design of new jointly operated unique mixed actinide super prompt critical solution assembly machine and full operations of the Critical Experiments Facility at Nevada.

Material Recycle and Recovery (FY 2011 $70.4; FY 2012 $85.9). FY 2012 request is $15.5 or 22.0 percent above the FY 2011 level. It provides for support LEPs and the disassembling of components from dismantled weapons including the stabilization and decontamination of nuclear material, primarily at Y-12.

Containers (FY 2011 $28.0; FY 2012 $29.0). FY 2012 request is $1.0 or 3.5 percent above the FY 2011 level. The request includes research, development, design, certification, testing and evaluation for shipping containers not directly associated with the life extension programs in DSW.

Storage (FY 2011 $24.2; FY 2012 $31.3). FY 2012 request is $7.0 or 29.0 percent above the FY 2011 level. It provides for increased non-nuclear material disposition activities at Pantex and increased capabilities to perform characterization activities on legacy components in storage, primarily in new pit surveillance techniques.

Construction (FY 2011 $399.0; FY 2012 $620.5). FY 2012 request is $221.5 or 55.5 percent above the FY 2011 level, primarily to sustain ongoing line item construction and project engineering and design activities. Increases are requested for the Chemistry and Metallurgy Research Replacement Facility at the Los Alamos National Laboratory and the Uranium Processing Facility (UPF) at Y-12. Funding will also provide for the start of construction of the Nuclear Facility Risk Reduction Project. At the Sandia National Laboratories, the funding will allow construction of the Test Capabilities Revitalization Project Phase II.

Secure Transportation Asset (FY 2011 $248.0; FY 2012 $251.3)..... +$3.2
FY 2012 request is 1.3 percent above the FY 2011 level. Funding provides personnel, training and equipment for the safe and secure transport of the nuclear security enterprise, DOE, DoD and other customer requirements. The increase is due to the federalization of pilots, the upgrades in secure communication systems, and a joint training exercise.

Nuclear Counterterrorism Incident Response (FY 2011 $233.1; FY 2012 $222.1)..... -$11.0
FY 2012 request is 4.7 percent below the FY 2011 level and provides funding for emergency management and response activities and for technical expertise supporting Homeland Security and counterterrorism efforts. The increase is focused on counterterrorism activities, and enables specialized R&D for technical analysis, equipment, and procedures necessary to maintain the nation's capabilities for research on non-stockpile nuclear weapons designs; e.g. Improvised Nuclear Devices or Radiological Dispersal Devices and the laboratory analysis of their aftermath, as well as ensures the capability to meet worldwide render safe support.

Facilities and Infrastructure Recapitalization Program (FY 2011 $94.0; FY 2012 $96.4)..+$2.4
FY 2012 request is 2.5 percent above the FY 2011 level and provides funding for recapitalization, infrastructure planning and construction. The program will continue to restore the condition of mission essential facilities and infrastructure across the nuclear security enterprise to an acceptable condition.

Site Stewardship (FY 2011 $105.5; FY 2012 $104.0) ..... -$1.5
The FY 2012 request is 1.4 percent below the FY 2011 level and provides funding for environmental compliance, energy efficiency and site utility upgrade projects. The Resource Conservation and Recovery Act (RCRA) mandated closure of Building 419 and the execution of the EMIP projects will continue. The Nuclear Materials Integration program will continue the treatment and disposition of NNSA materials currently stored at non-NNSA sites including the Idaho National Laboratory and Oak Ridge National Laboratory and energy conservation projects that will reduce energy consumption, enhance energy independence and security and provide life-cycle cost effective benefits will continue.

Safeguards and Security (FY 2011 $844.3; FY 2012 $849.5)..... +$5.2
FY 2012 request is 0.6 percent above the FY 2011 level. The Safeguards and Security program consists of two separate control levels: Defense Nuclear Security and Cyber Security.

Defense Nuclear Security (FY 2011 $720.0; FY 2012 $722.9) FY 2012 request is $2.9 or 0.4 percent above the FY 2011 level. Funding supports materials control and accountability,

application of emerging technologies, and physical security at NNSA sites. The increase of funding for life-cycle replacements is offset by the efficiencies achieved through risk-informed decisions regarding staffing levels and procurement of equipment and supplies.

Cyber Security (FY 2011 $124.3; FY 2012 $126.6) FY 2012 request is an increase of $2.3, or 1.8 percent above the FY 2011 level. Funding sustains NNSA's information infrastructure and upgrades elements to counter cyber threats from external and internal attacks using the latest available technology. The increase reflects support for cyber tracer, which is partially offset by a movement of funding in the technology application for the unclassified mission.

National Security Applications (FY 2011 $0.0; FY 2012 $20.0) ..... +$20.0
This subprogram, created by the Congress in 2009, provides a focal point for science, technology and engineering in NNSA, and facilitates a point of entry for the wider national security community into NNSA's programs and facilities. The funding supports strategic investments in national security science, technology and engineering capabilities and infrastructure including collaboration with the Defense Threat Reduction Agency, to address NNSA missions and current and future global security issues, including counterterrorism.

Congressionally Directed Projects (FY 2011 $0; FY 2012 $0) ..... -$0.0
No funds are requested.

Defense Nuclear Nonproliferation – NNSA

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2012 Cong. Request	FY 2012 vs. FY 2011	
				$	%
Nonproliferation and Verification R&D	311,274	351,568	417,598	+66,030	+18.8%
Nonproliferation and International Security	187,202	155,930	161,833	+5,903	+3.8%
International Nuclear Materials Protection and Cooperation	572,749	590,118	571,639	-18,479	-3.1%
Elimination of Weapons-Grade Plutonium Production Program	24,507	0	0	0	0%
Fissile Materials Disposition	701,900	1,030,713	890,153	-140,560	-13.6%
Global Threat Reduction Initiative	333,500	558,838	508,269	-50,569	-9.0%
Congressionally Directed Projects	250	0	0	0	0%
Total, Defense Nuclear Nonproliferation	**2,131,382**	**2,687,167**	**2,549,492**	**-137,675**	**-5.1%**

PROGRAM DESCRIPTION

NNSA's **Defense Nuclear Nonproliferation** (**NN)** appropriation provides funding for five programs which together provide policy and technical leadership to limit or prevent the spread of materials, technology, and expertise relating to weapons of mass destruction; advance technologies that detect the proliferation of weapons of mass destruction worldwide; and eliminate or secure inventories of surplus materials and infrastructure usable for nuclear weapons. It addresses the danger that hostile nations or terrorist groups may acquire weapons of mass destruction (WMD) or weapons-usable material, dual-use production technology, or weapons of mass destruction expertise. The request in FY 2012 is $2,549 million, a reduction of -$137.7 million, or 5.1% from the FY 2011 request, and work will be done in the following major areas.

Nonproliferation and Verification Research and Development reduces the threat to national security posed by nuclear weapons proliferation/detonation or the illicit trafficking of nuclear materials through the long-term development of new and novel technology. Using the unique facilities and scientific skills of the NNSA and DOE national laboratories and plants, in partnership with industry and academia, the program sponsors research and development that supports nonproliferation mission requirements necessary to close technology gaps identified through close interaction with NNSA and other U.S government agencies and programs. This program meets unique challenges and plays an important role in the federal government by driving basic science discoveries and developing new technologies applicable to nonproliferation, homeland security, and national security needs.

Nonproliferation and International Security (NIS) supports NNSA efforts to prevent and counter the proliferation or use of WMD, including materials, technology and expertise, by states and non-state actors. NIS focuses on strengthening the nonproliferation regime in order to reduce proliferation and counter terrorist risks by applying its unique expertise to safeguard nuclear material and strengthen its physical security; control the spread of WMD-related material, equipment, technology and expertise; verify nuclear reductions and compliance with nonproliferation treaties and agreements; and develop and implement Department of Energy (DOE/NNSA) nonproliferation and arms control policy.

International Nuclear Materials Protection and Cooperation works to prevent nuclear terrorism by working in Russia and other regions of concern to secure and eliminate vulnerable nuclear weapons and weapons-usable material under the Material Protection, Control and Accounting (MPC&A) Program; and installing detection equipment at border crossings, major international seaports, and Megaports to prevent and detect the illicit transfer of nuclear material under the Second Line of Defense (SLD) Program.

Elimination of Weapons-Grade Plutonium Production works with the Russian Federation to shut down the last three weapons-grade plutonium production reactors, ending weapons-grade plutonium production in Russia by replacing the reactors with fossil-fueled power plants to provide heat and electricity to the Siberian cities of Seversk and Zheleznogorsk.

Fissile Materials Disposition conducts activities in the United States to dispose of surplus weapons-grade fissile materials and supports disposal of Russian surplus weapon-grade plutonium.

The **Global Threat Reduction Initiative (GTRI)** mission is to reduce and protect vulnerable nuclear and radiological materials located at civilian sites worldwide. The GTRI works to prevent terrorists from acquiring nuclear and radiological materials that could be used in weapons of mass destruction or other acts of terrorism by converting research reactors and isotope production facilities from using highly enriched to low enriched uranium; removing and disposing of excess nuclear and radiological materials; and protecting high priority nuclear and radiological materials from theft and sabotage.

PROGRAM HIGHLIGHTS

The Nonproliferation and Verification Research and Development (R&D) program achieved notable milestones in advancing the state of the art in proliferation detection technology and in reinvigorating the research and development efforts in treaty verification and monitoring through the development of new nonproliferation test beds at the Nevada National Security Site (NNSS). It demonstrated neutron imaging of multiple sources under realistic distances – a first step towards application in a warhead counting exercise. The R&D program conducted field tests at NNSS which demonstrated for the first time the ability of remote sensing systems, originally designed for gaseous emissions, to detect solid effluents at nuclear fuel cycle sites – these signatures persist even when facilities are not operating. R&D improved fundamental material properties of plastic-based radiation detectors potentially allowing production of cheap, large-scale plastic portal monitors able to do isotope identification. It conducted early on-orbit testing of a newly fielded nuclear detonation detection payload, Global Positioning System (GPS) - IIF block, that provides better and more sensitive geo-location capabilities. It delivered the first of next-generation high altitude nuclear detonation detection payloads with a dramatic increase in sensitivity. It completed final design of a nuclear detonation detection payload planned for GPS-III maintaining the capability of the constellation for global surveillance. It completed radioactive decay measurements for operational post-detonation forensics that is critical to weapon attribution.

The Nonproliferation and International Security program request supports the implementation of the Next Generation Safeguards Initiative to strengthen IAEA safeguards and to revitalize the U.S. technical and human capital base that supports them; efforts to reduce proliferation risks associated with the expansion of nuclear power; and the development and implementation of reliable fuel services as an alternative to further the spread of enrichment and reprocessing capabilities. This funding will also support applied development and evaluation of technologies to support U.S. arms control and nonproliferation initiatives, including treaty verification and transparency. Lastly, the funding profile provides for activities that prevent and counter WMD proliferation including continued support of U.S. efforts to address proliferation by Iran, North Korea, and proliferation networks; implement nuclear arms reduction and associated agreements; strengthen international nonproliferation agreements and standards; implement statutory export control and safeguards requirements; encourage global adherence to and implementation of international nonproliferation requirements; and support high priority diplomatic initiatives.

The International Nuclear Materials Protection and Cooperation (INMP&C) program prevents nuclear terrorism by working in Russia and other regions of concern to secure and eliminate vulnerable nuclear weapons and weapons-usable material and to install detection equipment at international crossing points and Megaports to prevent and detect the illicit transfer of nuclear material. INMP&C had completed MPC&A upgrades in Russia at a total of 73 warhead sites by the end of calendar year 2008 and plans to complete approximately 229 buildings containing weapons usable nuclear material by the end of FY 2013; blend-down a total of approximately 17 MTs of HEU by the end of FY 2015; and install radiation detection equipment at approximately 650 international crossings around the world and at approximately 100 ports of interest in approximately 40 countries by the end of 2018. Under the Second Line of Defense (SLD) program, a total of 399 sites have been equipped with radiation detection equipment to date, at 240 international crossing points in Russia, 125 sites in 15 countries outside Russia, including airports, rail, pedestrian and vehicle crossings, and 34 ports in 23 international locations.
INMP&C will sustain upgrades at all 73 Russian Ministry of Defense nuclear warhead sites in FY 2012 and continue security upgrades at 25 nuclear material sites including the completion of upgrades to a cumulative total of 218 of 229 buildings containing weapons-usable material in Russia and the FSU. INMP&C will also continue to assist Russia to

consolidate weapons-usable materials into locations and to down-blend highly enriched uranium (HEU) to low enriched uranium (LEU). In FY 2012, INMP&C expects that over 14 metric tons of Russian HEU will have been down-blended. The request will also support the installation of radiation detection equipment at 30 foreign sites and 3 Megaports.

The Fissile Materials Disposition program supports three major construction projects: (1) Mixed Oxide Fuel Fabrication Facility, (2) Pit Disassembly and Conversion Project, and (3) the Waste Solidification Building. These projects are vital to the nation's arms control and nuclear nonproliferation efforts as they provide the means to dispose of U.S. plutonium declared excess to our national defense needs. Funding also supports continued work with the Russian Federation on its plutonium disposition pursuant to the amended Plutonium Management and Disposition Agreement (PMDA).

The Global Threat Reduction Initiative (GTRI) addresses the global nature of the nuclear proliferation threat by focusing resources on high value, near term risk reduction activities. GTRI directly supports the international effort to accelerate efforts to secure and remove all vulnerable nuclear material from the most vulnerable sites within four years, by the end of 2012. GTRI is serving to implement part of the Bratislava Summit Statement on Nuclear Security Cooperation between the United States and the Russian Federation. In accordance with this agreement GTRI developed and has implemented an aggressive, prioritized work schedule to complete all shipments of Russian origin spent HEU fuel stored outside reactor cores. The FY 2012 budget includes $558.8 million for activities to reduce and protect vulnerable nuclear and radiological materials located at civilian sites worldwide, including $145.2 million for Russia-origin fuel return and $119 million for reactor conversions.

The Global Partnership against the Spread of Weapons and Materials of Mass Destruction, formed at the Kananaskis Summit in June 2002, recommitted the G8 nations (U.S., Canada, France, Germany, Italy, Japan, Russia, and the United Kingdom) to address nonproliferation, disarmament, counter-terrorism, and nuclear safety issues. The G8 countries have pledged $20 billion over 10 years to support cooperative efforts and have invited other similarly motivated countries to participate in this partnership. The U.S. has committed to provide $10 billion over 10 years to be matched by $10 billion from the other members, confirming that proliferation concerns are of the highest government priority; and that this program's work is of paramount importance for the security of the nation and the world. NNSA has costed a total of $4,252 million from FY 2002 through FY 2010 in support of this commitment. NNSA plans to spend a total of $531.7 million in FY 2011, and the FY 2012 request provides an additional $458.0 million toward the total U.S. commitment to the Global Partnership.

SIGNIFICANT FUNDING CHANGES – FY 2011 Request to FY 2012 Request ($ in millions)

Defense Nuclear Nonproliferation (FY 2011 $2,687.2; FY 2012 $2,549.5)..... -$137.7
FY 2012 request is 5.1% percent below the FY 2011 request reflecting the milestones brought forward into FY 2011 to meet the President's objective in securing vulnerable nuclear materials world-wide. The program will continue to focus on this high risk reduction objective as well as support SLD Megaports, and construction of the U.S. plutonium disposition facilities.

Nonproliferation and Verification R&D (FY 2011 $351.6; FY 2012 $417.6)…….. +$66.0
FY 2012 request includes:

Proliferation Detection (FY 2011 $225.0; FY 2012 $218.4) .....-$6.6
Decrease reflects reduction of funding for the Integrated University Program.

Nuclear Detonation Detection (FY 2011 $126.6; FY 2012 $127.8) .....+$1.2
Increase sustains a satellite sensor production rate of two Global Burst Detector payloads per year.

Pensions (FY 2011 $0.0; FY 2012 $71.4).....+$71.4
Increase supports pension plan contributions, primarily for the University of California, and expected shortfalls from contractor supported defined benefit pensions.

Nonproliferation and International Security (FY 2011 $155.9; FY 2012 $161.8).....+$5.9
FY 2012 request includes:

Nuclear Safeguards and Security (FY2011 $53.6; FY2012 $53.9) .....+$0.3

Activities reorganized from the former Dismantlement and Transparency, International Regimes and Agreements, and Treaties and Agreements. Increase is due to normal escalation of labor and travel.

Nuclear Controls (FY2011 $48.2: FY2012 $48.5) .....+$0.3
Activities reorganized from the former Global Security Engagement and Cooperation and International Regimes and Agreements. Increase is due to normal escalation of labor and travel.

Nuclear Verification (FY2011 $41.8: FY2012 $47.0) .....+$5.2
Activities reorganized from the former Dismantlement and Transparency Program. Increase is due to normal escalation of labor and travel.

Nonproliferation Policy (FY2011 $12.3: FY2012 $12.4) .....+$0.1
Activities reorganized from the former Treaties and Agreements and International Regimes and Agreements. Increase is due to normal escalation of labor and travel.

International Nuclear Materials Protection and Cooperation
(FY 2011 $590.1.; FY 2012 $571.6) ..... -$18.5

Navy Complex (FY 2011 $34.3; FY 2012 $33.7) .....-$0.7
Decrease reflects shift towards more sustainability support for installed MPC&A upgrades.

Strategic Rocket Forces (FY 2011 $51.4; FY 2012 $59.1).....+$7.7
Increase reflects additional infrastructure support for the sustainability of installed MPC&A upgrades.

Rosatom Weapons Complex (FY 2011 $105.3; FY 2012 $80.7) .....-$24.6
Decrease reflects programmatic shift from large-scale MPC&A upgrades at Russian sites towards more sustainability support.

Civilian Nuclear Sites (FY 2011 $59.0; FY 2012 $59.1) .....+$.1
Increase maintains sustainability support to civilian nuclear sites and plans to continue to cooperate with countries outside of Russia and the Former Soviet States.

Material Consolidation and Conversion (FY 2011 $13.9; FY 2012 $14.3).....+$0.4
Increase reflects a higher projected availability of excess HEU to be downblended to LEU.

National Programs and Sustainability (FY 2011 $60.9; FY 2012 $60.9).....$.0

Second Line of Defense (SLD) (FY 2011 $265.3; FY 2012 $263.8) .....-$1.5
Decrease reflects the shift of lower priority sites into the outyears.

Fissile Materials Disposition (FY 2011 $1,030.7; FY 2012 $890.2) ..... -$140.6

U.S. Surplus Fissile Materials Disposition
(FY 2011 $917.7; FY 2012 $880.0) .....-$37.7
Decrease reflects the completion of long-lead procurements for the MOX and WSB projects.

Russian Surplus Fissile Materials Disposition
(FY 2011 $113.0; FY 2012 $10.2) .....-$102.8
Further major funding request awaits an agreement between the U.S. and Russia on detailed implementation milestones.

Global Threat Reduction Initiative (FY 2011 $558.8; FY 2012 $508.3) ..... -$50.6

HEU Reactor Conversion (FY 2011 $119.0; FY 2012 $148.3).....+$29.3
Increase reflects support to accelerate the establishment of a reliable domestic production capability for the critical medical isotope Mo-99 without the use of HEU.

Nuclear and Radiological Material Removal (FY 2011 $355.7; FY 2012 $257.0) -$98.7
The decrease funding request in FY 2012 is consistent with the four year program plan. Additional funding was requested in FY 2011 to fund removal efforts that will occur in early 2012 to meet the Administration's goal of securing vulnerable material in four years.

Nuclear and Radiological Material Protection
(FY 2011 $84.1; FY 2012 $103.0) .....+18.9
Increase reflects the need to accelerate the security upgrades on high activity radiological materials in the United States and worldwide (an increase in buildings secured from 110 in FY 2011 to 158 in FY 2012).

Office of the Administrator – NNSA

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2012 Cong. Request	FY 2012 vs. FY 2011 $	FY 2012 vs. FY 2011 %
Office of the Administrator	418,074	448,267	450,060	+1,793	+0.4%
Congressionally Directed Projects	13,000	0	0	0	0%
Subtotal, Office of the Administrator	***431,074***	***448,267***	***450,060***	***+1,793***	***+0.4%***
Adjustments:					
Use of Prior Year Balances	-10,320	0	0	0	0%
Transfer of Prior Year Balances	-10,000	0	0	0	0%
Subtotal, Adjustments	***-20,320***	***0***	***0***	***0***	***0%***
Total, Office of the Administrator	**410,754**	**448,267**	**450,060**	**+1,793**	**+0.4%**

PROGRAM DESCRIPTION

NNSA's **Office of the Administrator** request provides for a well-managed, inclusive, responsive, and accountable organization through the strategic management of human capital; cost-effective utilization of information technology; and integration of budget and performance. The workforce is a highly educated and skilled cadre of federal managers who oversee the operations of the nuclear security enterprise and perform many specialized duties including leading emergency response teams, nuclear nonproliferation leadership, safeguards and security oversight, and policy and strategic coordination of counterterrorism and counter proliferation initiatives. The Naval Reactors and Secure Transportation Asset programs retain separately funded program direction accounts.

The organizational structure includes eight site offices that oversee NNSA contractor operations located at Lawrence Livermore, Los Alamos, and Sandia National Laboratories; Pantex and Kansas City plants; Y-12 National Security Complex; Savannah River Site; and the Nevada National Security Site. The NNSA Service Center in Albuquerque provides procurement, human resources, and other support to the site offices and Headquarters. The FY 2012 request for this program is $450.1 million.

PROGRAM HIGHLIGHTS

This program provides funding for federal staff and required support for NNSA activities at Headquarters and field locations, as well as support for Departmental administrative activities through the Working Capital Fund. NNSA continues with its five year DEMO project with the Office of Personnel Management on pay for performance.

SIGNIFICANT FUNDING CHANGES – FY 2011 Request to FY 2012 Request ($ in millions)

Office of the Administrator (FY 2011 $448.3; FY 2012 $450.1) ..... +$1.8

- The FY 2012 request provides support for 56 limited-term full time equivalents (FTEs) for the Federal oversight of the following construction projects: Pit Disassembly and Conversion at the Savannah River Site ($5,000,000; 20 limited-term FTEs); Uranium Processing Facility at Y-12 ($6,750,000; 27 limited-term FTEs); and the Chemistry and Metallurgy Research Replacement Facility at Los Alamos National Laboratory ($2,250,000; 9 limited-term FTEs). This request is consistent with the DOE/NNSA federal project management improvement initiative. The request also includes an increase in Other Related Expenses to fully fund all NNSA site office space requirements across the nuclear security enterprise, building maintenance at the Service Center, increases for the operational costs associated with the international offices, and increases to the Working Capital Fund to support increased iManage

efforts and federal salaries for support staff. These increases are partially offset by a decrease of FTEs due to Governance efficiencies, and decreases for the accountable government initiative to reduce administrative costs including advisory contracts, travel of people and things, printing, and supplies.

Congressionally Directed Projects (FY 2011 $0.0; FY 2012 $0.0) $0.0
In FY 2012, the Office of the Administrator request will provide $4.7 million for the Massie Chairs of Excellence and support for other Minority Serving Institutions; the Weapons Activities appropriation plans to provide up to $6 million; the Defense Nuclear Nonproliferation appropriation plans to provide up to $3 million; and the Naval Reactors program plans to provide up to $1 million for HBCU efforts.

Naval Reactors - NNSA

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Cong. Request	FY 2012 Cong. Request	FY 2012 vs. FY 2011 $	FY 2012 vs. FY 2011 %
Naval Reactors Development	908,333	1,030,486	1,109,162	+78,676	+7.6%
Program Direction	36,800	40,000	44,500	+4,500	+11.3%
Total, Naval Reactors	**945,133**	**1,070,486**	**1,153,662**	**+83,176**	**+7.8%**

PROGRAM DESCRIPTION

The Naval Reactors (NR) program has responsibility for all naval nuclear propulsion work, beginning with reactor technology development, continuing through construction, testing, operation, maintenance, and ultimately, reactor plant disposal. The **Naval Reactors request for FY 2012 is $1.2 billion**, an increase of $83.2 million over the FY 2011 request.

The program's efforts ensure the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers, constituting 40 percent of the Navy's combatants. The program's long-term development work ensures that nuclear propulsion technology can meet requirements to maintain and upgrade current capabilities, as well as meet future threats to U.S. security. A growing activity of the program is the conduct of research and development to fulfill the Navy's requirements for new nuclear propulsion plants that meet current and future national defense requirements.

Recent and ongoing work includes the ramp up of the design and development efforts for the OHIO Class submarine replacement, the OHIO class submarine reactor core and recapitalization of the spent nuclear fuel infrastructure. The OHIO replacement will have significant improvements in life-cycle costs, advanced power capabilities, and increased endurance compared to current plants.

PROGRAM HIGHLIGHTS

The FY 2012 request provides $1,153.7 million for Naval Reactors; an increase of $83.2 million above the FY 2011 request and includes a transfer of $28 million from the Department of Defense (DoD).

The increase in funding supports several important new initiatives: a ramp up of the design and development work for the Ohio-class ballistic missile submarine replacement, and the recapitalization of spent nuclear fuel infrastructure in Idaho. Funding also supports continuing efforts to ensure the safety and reliability of the 104 operating naval reactor plants, and continued environmental stewardship and oversight of facilities.

SIGNIFICANT FUNDING CHANGES – FY 2011 Request to FY 2012 Request ($ in millions)

Naval Reactors Development (FY 2011 $1,070.5; FY 2012 $1,153.7) ..... +$83.2
Increase in Operations and Maintenance and overall increase in Construction and Program Direction funding, as follows:

Operations and Maintenance (FY 2011 $997.9; FY 2012 $1,069.3)**..... +$71.4**
FY 2012 request is 7.2 percent above the FY 2011 level. Increases in all Operations and Maintenance activities reflect support for several research and development initiatives, including: 1) DOE-cognizant design and development activities for the reactor plant for the OHIO-class ballistic missile submarine replacement ($121.3); 2) new reactor plant core development in support of refueling efforts for a land-based prototype that serves as a testing platform for new naval reactor technologies ($99.5); and 3) design efforts in support of recapitalization of the Program's spent nuclear fuel infrastructure ($53.8).

Construction (FY 2011 $32.6; FY 2012 $39.9)..... **+$7.3**
FY 2012 request is 22.4 percent above the FY 2011 level. Overall increase supports line item construction funding for the NRF Infrastructure upgrades at Idaho (+$11.5), which is partially offset by decreases in construction funding at the Naval Reactors Facility (NRF) Office building #2 in Idaho (-$4), and security upgrades at Knolls Atomic Power Laboratory (-$.3).

Program Direction (FY 2011 $40.0; FY 2012 $44.5)..... **+$4.5**
FY 2012 request is 11.3 percent above the FY 2011 level. Increase reflects additional FTEs to support oversight of new projects and initiatives.

Energy Information Administration

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
National Energy Information System	110,595	110,595	123,957	+13,362	+12.1%
Total, Energy Information Administration	**110,595**	**110,595**	**123,957**	**+13,362**	**+12.1%**

PROGRAM DESCRIPTION

The **U.S. Energy Information Administration** (EIA) is the statistical and analytical agency within the U.S. Department of Energy. EIA collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. EIA is the Nation's premier source of energy information and, by law, its data, analyses, and forecasts are independent of approval by any other officer or employee of the United States Government.

PROGRAM HIGHLIGHTS

The **FY 2012 request** for EIA is **$124.0 million**, which is a $13.4 million increase over the FY 2010 current appropriation of $110.6 million. EIA conducts a comprehensive data collection program that covers the full spectrum of energy sources, end uses, and energy flows; generates short- and long-term domestic and international energy projections; and performs informative energy analyses. EIA disseminates its data products, analyses, reports, and services to customers and stakeholders primarily through its website. To better fulfill its mission, EIA recently completed a reorganization along functional lines in order to improve operational efficiency and promote product innovation.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Energy Information Administration (FY 2010 $110.6; FY 2012 $124.0)..... +$13.4
Increased funding improves EIA's capability to close energy information gaps, strengthen analysis, and better communicate important energy information to its community of users. Provides for expanded surveys of energy consumption in homes, commercial buildings, and manufacturing to provide baseline information critical to understanding energy utilization and for use as the basis for benchmarking and performance measurement of energy efficiency programs (+$7.0); continued upgrades to the aging National Energy Model, which will improve EIA's ability to assess and forecast supply, demand, and technology trends affecting U.S. and world energy markets (+$1.6); continued improvements in energy data coverage and quality (+$1.4); analysis of energy market behavior and the interrelationship of energy and financial markets (+$0.9); developing and implementing innovative, web-based content and expanding EIA's popular energy education product (+$0.3); and 16 FTEs to support these activities (+$2.2).

Power Marketing Administrations

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Southeastern Power Administration					
Southeastern Power Administration	92,866	92,866	123,298	+30,432	+32.8%
Less Alternative Financing (for PPW)/Offsetting Collection	-92,866	-92,866	-123,298	-30,432	-32.8%
Subtotal, Southeastern Power Administration	***0***	***0***	***0***	***0***	***0%***
Southwestern Power Administration					
Southwestern Power Administration	94,944	0	107,007	+12,063	+12.7%
Less Alternative Financing/Offsetting Collection	-81,868	13,076	-95,115	-13,247	-16.2%
Subtotal, Southwestern Power Administration	***13,076***	***13,076***	***11,892***	***-1,184***	***-9.1%***
Western Area Power Administration					
Western Area Power Administration	899,317	109,181	863,469	-35,848	-4.0%
Less alternative financing/Offsetting collection (P.L. 108-477/109-103)	-790,136	0	-767,501	+22,635	+2.9%
Subtotal, Western Area Power Administration	***109,181***	***109,181***	***95,968***	***-13,213***	***-12.1%***
Falcon and Amistad Operating and Maintenance Fund					
Operation and Maintenance	2,568	220	4,169	+1,601	+62.3%
Offsetting Collections	-2,348	0	-3,949	-1,601	-68.2%
Subtotal, Falcon and Amistad Fund	***220***	***220***	***220***	***0***	***0%***
Colorado River Basins Power Marketing Fund					
Spending Authority from Offsetting Collections	261,723	0	220,397	-41,326	-15.8%
Offsetting Collections	-284,723	-23,000	-243,397	+41,326	+14.5%
Subtotal, Colorado River Basins	***-23,000***	***-23,000***	***-23,000***	***0***	***0%***
Total, Power Marketing Administrations	**99,477**	**99,477**	**85,080**	**-14,397**	**-14.5%**

PROGRAM DESCRIPTION

The four **Power Marketing Administrations** (PMAs) sell electricity primarily generated by federally owned hydropower projects, contributing to the reliability of the nation's electricity supply and grid. Preference in the

sale of power is given to public entities and electric cooperatives. Revenues from the sale of federal power and transmission services are used to repay all related power costs.

The **Southeastern Power Administration** (Southeastern) markets and delivers all available federal hydroelectric power from 22 U.S. Army Corps of Engineers (Corps) multipurpose projects to preference customers in an eleven-state area in the southeastern United States. Southeastern does not own or operate any transmission facilities, and contracts with regional utilities that own electric transmission systems to deliver the federal hydropower to Southeastern's customers.

The **Southwestern Power Administration** (Southwestern) markets and delivers renewable federal hydroelectric power from 24 Corps multipurpose projects to preference customers in a six-state area and participates with other water resource users in an effort to balance diverse interests with power needs. To deliver power to its customers, Southwestern maintains 1,380 miles of high-voltage transmission lines, 25 substations/switchyards, and 51 microwave and VHF radio sites. The President's budget request for Southwestern provides for maintenance, additions, replacements, and interconnections ensuring a clean, affordable and reliable federal power system, which is an integral part of the nation's electrical grid.

The **Western Area Power Administration** (Western) markets and transmits Federal power to a 1.3-million-square-mile service area in 15 central and western states from 56 Federally-owned hydroelectric power plants primarily operated by the Bureau of Reclamation (Bureau), the Corps, and the International Boundary and Water Commission. Western also markets the United States' entitlement to power from the Navajo coal-fired power plant near Page, Arizona.

The **Bonneville Power Administration** (Bonneville) provides electric power, transmission, and energy services to a 300,000-square-mile service area in eight states in the Pacific Northwest. Bonneville wholesales the power produced at 31 federal projects operated by the Corps and the Bureau and from certain non-federal generating facilities. Bonneville, which is self-financed with revenues, funds the expense portion of its budget, and the power operations and maintenance costs of the Bureau of Reclamation and the Army Corps of Engineers in the Federal Columbia River Power System. The capital portion of the budget is funded mostly through borrowing from the U.S. Treasury at market rates for similar projects and with some non-federal financing.

PROGRAM HIGHLIGHTS

The President's FY 2012 budget continues the use of receipts to offset the annual expenses of the Western, Southwestern and Southeastern Power Marketing Administrations (PMAs) to allow for better operations and maintenance planning and execution, leading to a more reliable power system. The Bonneville Power Administration (Bonneville), unlike the other PMAs, is "self-financed" by the ratepayers of the Pacific Northwest and receives no direct, annual appropriations from Congress. Under the Federal Columbia River Transmission System Act of 1974, Bonneville funds the expense portion of its budget and repays the federal investment and bonds issued to the Treasury with revenues from electric power and transmission rates.

In FY 2012, both Western and Bonneville will continue the development and construction of major transmission projects in their service territories with the borrowing authority they were provided under the Recovery Act. Many of these projects are designed specifically to facilitate the delivery of renewable energy resources to market.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Southeastern Power Administration (FY 2010 $0.0; FY 2012 $0.0) ..... -$0.0

Program Direction (FY 2010 $7.6; FY 2012 $8.4).....+$0.8
The increase reflects the FY 2012 salaries and benefits as well as mission related travel and other operating expenses. The increase also supports improvements in communication infrastructure and IT security assessment and program expansion in energy efficiency and renewable energy promotion.

Purchase Power and Wheeling (FY 2010 $85.2; FY 2012 $114.9) .....+$29.7
(FY 2010 alternative financing $14.4; use of receipts $70.8; FY 2012 alternative financing $14.7; use of receipts $100.2). The majority of the FY 2012 request increase results from increased pumping energy costs to support the Richard B. Russell and Carters projects as well as expected increased power

purchase expenses at the Jim Woodruff project. This funding level will allow Southeastern to purchase and deliver energy to meet its limited peaking power contractual obligations. Federal power receipts as well as alternative financing methods will be used to fully offset the costs of system operations.

Alternative Financing (FY 2010 -$14.4; FY 2012 -$14.7) ..... -$0.3
Alternative financing will be used to offset Purchase Power and Wheeling expenses, which enables Southeastern to continue to meet their annual operation and maintenance requirements and purchase power and wheeling needs.

Offsetting Collections (FY 2010 -$78.4; FY 2012 -$108.6) ..... -$30.2
The FY 2012 budget includes the use of Southeastern's receipts to offset appropriations for annual expenses in the Program Direction (-$8.4) activity. Southeastern will continue to use receipts to fund a portion of Purchase Power and Wheeling program expenses (-$100.2), which enables Southeastern to meet its annual operation and maintenance requirements and purchase power and wheeling needs.

Southwestern Power Administration (FY 2010 $13.1 FY 2012 $11.9) ..... -$1.2

Operations and Maintenance (FY 2010 $13.8; FY 2012 $14.3) ..... +$0.5
(FY 2010 alternative financing $0; offsetting collections $5.6; FY 2012 alternative financing $2.2, offsetting collections $7.4) The increase in funding reflects the purchase of instrument transformers to ensure system reliability.

Program Direction (FY 2010 $27.2; FY 2012 $31.9) ..... +$4.7
(FY 2010 alternative financing $0, offsetting collections $26.2; FY 2012 alternative financing $4.7, offsetting collections $25.7) The increase reflects an upgrade to the Financial Management System and additional FTE added in FY 2011 for NERC related issues and succession planning. Increase also includes planned promotions and step increases. The amount identified for Salaries and Benefits has been adjusted to reflect the salary freeze for FY 2012.

Purchase Power and Wheeling (FY 2010 $48.0; FY 2012 $50.0) ..... +$2.0
(FY 2010 alternative financing $10.0, offsetting collection $38.0; FY 2012 alternative financing $10.0, offsetting collections $40.0) Increase supports Southwestern's anticipated needs to ensure adequate funding to fulfill its 1200-hour peaking power contractual obligations based on volatile market prices, limited availability of energy banks, and all but the most severe hydrological conditions. The amount of alternative financing will offset the costs of purchase power and wheeling, system support and other contractual obligations. When hydro generation is below normal, Southwestern will utilize the Continuing Fund to defray emergency expenses to ensure continuity of electric service.

Construction (FY 2010 $6.0; FY 2012 $10.8) ..... +$4.8
(FY 2010 alternative financing $2.0; FY 2012 alternative financing $5.1) The increase in funding reflects a greater emphasis on transmission line repairs and upgrades.

Alternative Financing (FY 2010 -$12.0; FY 2012 -$22.0) ..... -$10.0
FY 2012 alternative financing will be used to offset Program Direction (-$4.7), Operations and Maintenance (-$2.2), Construction (-$5.1) and Purchase Power and Wheeling (-$10.0). The amounts identified will allow Southwestern to continue to meet its annual operation and maintenance requirements.

Offsetting Collections (FY 2010 -$69.9; FY 2012 -$73.1) ..... -$3.2
Includes the use of Southwestern's receipts to offset appropriations for FY 2012 annual expenses in the Operations and Maintenance (-$7.4) and Program Direction (-$25.7) activities. Southwestern will continue to use receipts to fund a portion of Purchase Power and Wheeling program expenses (-$40.0), which enable Southwestern to meet its annual hydroelectric contractual obligations.

Western Area Power Administration (FY 2010 $109.2; FY 2012 $96.0) ..... -$13.2
FY 2012 Construction, Rehabilitation, Operation, and Maintenance program level is $863.5 compared to $899.3 in FY 2010 and will be funded by $96.0 in budget authority, $496.5 in offsetting collections, $4.8 through a

reimbursable agreement with the Bureau of Reclamation using offsetting collections from P.L. 98-381 from the Colorado River Dam Fund (CRDF), and $266.2 of alternative financing.

Construction and Rehabilitation (FY 2010 $105.0; FY 2012 $110.4) .....+$5.4
(FY 2010 alternative financing $83.8, appropriations $21.2; FY 2012 alternative financing $93.3, appropriation $17.1) Provides for transmission line and substation rehabilitation to address Western's aging transmission system infrastructure and reliability concerns. Western will seek greater alternative financing with customers to fund the majority of the FY 2012 capital requirements without appropriations.

Operation and Maintenance (FY 2010 $57.2; FY 2012 $72.9).....+$15.7
(FY 2010 alternative financing $0.4, offsetting collections $37.0, offsetting collections from CRDF $0.9, appropriations $18.9; FY 2012 alternative financing $4.6, offsetting collections $33.3, offsetting collections from CRDF $1.0, appropriations $33.9.) The increase in regular Operation and Maintenance activities is attributed to the cyclical increase in planned maintenance activities with inflationary factors. The increase in Replacement and Additions is primarily attributed to line upgrades and rebuilds of Western's aging infrastructure, replacements of aging and failing transformers, and protective equipment to aid in voltage control. Also included in this increase is funding for communication equipment and replacement of moveable capital equipment used to maintain Western's transmission lines and substations.

Purchase Power and Wheeling (FY 2010 $548.8; FY 2012 $471.5).....-$77.3
(FY 2010 alternative financing $199.0; use of receipts $349.8; FY 2012 alternative financing $165.0; use of receipts $306.5) FY 2012 decrease in purchase power and wheeling reflects a reduction in the amount of power purchased as a result of improving hydro conditions in the Pick-Sloan Missouri River Basin.

Utah Reclamation Mitigation & Conservation (FY 2010 $7.6; FY 2012 $3.4)...-$4.2
Provides for Western's annual transfer of funding to the Utah Reclamation Mitigation and Conservation account from the Construction Rehabilitation, Operations and Maintenance account.

Program Direction (FY 2010 $180.8; FY 2012 $205.2).....+$24.4
(FY 2010 alternative financing $5.7, offsetting collections $110.5, offsetting collections from CRDF $3.0, appropriations $61.5; FY 2012 alternative financing $3.3, offsetting collections $156.6, offsetting collections from CRDF $3.8, appropriations $41.6) Increase reflects the effect of Western's pay raise to those salaries determined by prevailing rates in the electric utility industry, planned promotions, and estimated benefit increases for Western's General Schedule employees. The increase also reflects additional work scope in economic and environmental analysis in support of Western's capital mission needs, ADP program support associated with Western's financial system upgrade, and general administrative support associated with Western's mission requirements in financial, clerical, compliance, and analysis assistance.

Offsetting Collections (FY 2010 -$501.2; FY 2012 -$501.3) .....+0.1
In FY 2012, Western will use receipts (-$189.9) to offset appropriations for annual expenses in the Operation and Maintenance and Program Direction activities, will use receipts to fund a portion of Purchase Power and Wheeling program expenses (-$306.5) and will use CRDF receipts (-$4.8) to support Boulder Canyon Project activities.

Alternative Financing (FY 2010 -$288.9; FY 2012 -$266.2).....+$22.7
Alternative financing methods, including cash advances from customers, will be used to offset Program Direction (-$3.3); Operation and Maintenance (-$4.6); Construction (-$93.3); and Purchase Power and Wheeling (-$165.0) appropriation requirements.

Bonneville Power Administration (self financed through revenues)

Budget Obligations (FY 2010 $4,149; FY 2012 $4,568)..... +$399.0
No direct annual appropriations are received from Congress. In FY 2012, total requirements of all Bonneville programs include estimated budget obligations of $4,568 million. This amount includes operating expenses of $3,195 million, capital investments of $937 million, and $52 million in projects funded in advance; with $383

million in capital transfers. These investments provide electric utility and general plant requirements associated with the Federal Columbia River Power System's transmission services, capital equipment, hydroelectric projects, conservation, and capital investments in environment, fish, and wildlife. The increase is primarily attributable to increases in the Capital program for Power Services and Transmission Services.

Power Services-Capital (FY 2010 $247.1; FY 2012 363.3) .....+$77.1
Provides for additions, improvements, and replacements of existing U.S. Bureau of Reclamation and U.S. Army Corps of Engineers' hydroelectric projects in the Pacific Northwest to improve power systems reliability. Increases are required to maintain a minimum level of generation each year and to achieve higher conservation targets in the Council's 6th Power Plan.

Transmission Services-Capital (FY 2010 $304.5; FY 2012 $526.7) .....+$241.1
Provides for planning, design and construction of transmission lines, substation, control system additions, replacements, and enhancements to the FCRPS transmission system, including initiation of design and construction of various radio replacements at accessible sites. Increase in FY 2012 reflects increase primarily in Main Grid projects.

Departmental Administration

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Administrative Operations:					
Salaries and Expenses:					
Office of the Secretary	5,864	0	5,030	-834	-14.2%
Chief Financial Officer	62,981	0	53,204	-9,777	-15.5%
Office of Management	78,456	0	62,693	-15,763	-20.1%
Chief Human Capital Officer	29,537	0	23,089	-6,448	-21.8%
Chief Information Officer	103,063	0	85,928	-17,135	-16.6%
Congressional & Intergovernmental Affairs	4,826	0	4,690	-136	-2.8%
Economic Impact and Diversity	6,671	0	7,473	+802	+12.0%
General Counsel	32,478	0	34,642	+2,164	+6.7%
Policy and International Affairs	30,253		28,872	-1,381	-4.6%
Public Affairs	4,500	0	3,801	-699	-15.5%
Office of Indian Energy Policy and Programs	5,500	0	1,500	-4,000	-72.7%
Other Defense Related Activities					
Funding from Other Defense Activities	-122,982	0	-118,836	+4,146	+3.4%
Subtotal, Administrative Operations	***241,147***	***168,944***	***192,086***	***-49,061***	***-20.3%***
Cost of Work/Revenue					
Departmental Administration Cost of Work for Others	47,537	0	48,537	+1,000	+2.1%
Miscellaneous Revenues					
Revenues Associated with Cost of Work	-48,537	0	-48,537	0	0%
Other Revenues	-71,203	0	-63,346	+7,857	+11.0%
Subtotal, Miscellaneous Revenues	***-119,740***	***0***	***-111,883***	***+7,857***	***+6.6%***
Subtotal, Cost of Work/Revenue	***-72,203***	***0***	***-63,346***	***+8,857***	***+12.3%***
Total, Departmental Administration (Net)	**168,944**	**168,944**	**128,740**	**-40,204**	**-23.8%**

PROGRAM DESCRIPTION

The **Departmental Administration (DA)** appropriation funds 10 DOE-wide management organizations under Administrative Operations. These organizations support headquarters operations in human resources, administration, accounting, budgeting, program analysis, project management, information management, legal services, life-cycle asset management, workforce diversity, minority economic impact, policy, international affairs, congressional and intergovernmental liaison, and public affairs. Funding for the Office of the Secretary is provided separately from the other administrative functions within the DA appropriation. The DA appropriation also budgets for Cost of Work for Others and receives miscellaneous Revenues from other sources.

DOE also operates a Working Capital Fund (WCF) as a financial tool to improve management of common administration services. The objectives of the WCF are to fairly allocate costs to mission programs; to offer better choices on amount, quality, and sources of services; and to provide flexibility for service providers to respond to customer needs. In FY 2012 $8.3 million in federal salaries are included in each respective business, based on direct manpower support to Fund businesses. Other increases include: Building (+$6.9 million) due to GSA rent increases; iManage (+$3.9 million); Telecommunications (+$2.9 million) due to cellular usage and Networx implementation; DCAA Audits (+$4.7 million); and, Online Learning (+$1.3 million).

PROJECTED CUSTOMER COSTS FY 2012
Comparison of Annual Estimates by Business Line

ORG CODE	FY 2010 Actual	FY 2012 Estimates
Supplies	3,653	3,662
Mail	3,553	4,413
Copy	2,687	3,367
P&G	3,080	4,227
Building	90,598	97,147
Phones	17,210	20,530
Proc Mgt	7,425	12,418
Corp Training	295	2,103
PMCDP	1,396	1,450
iManage	15,527	22,034
A-123	3,700	4,060
Fin. Stmt Aud.	12,000	12,108
Fund Mgr	120	0
TOTAL	$161,243	$187,518

PROGRAM HIGHLIGHTS

The FY 2012 request provides $5.0 million for 34 full time equivalent employees (FTEs) within the Office of the Secretary. This request also provides $128.7 million for salaries and benefits, travel, contractual services, and program support expenses for 1,189 FTEs for the other organizations within the DA account.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Office of the Secretary (FY 2010 $5.9; FY 2012 $5.0) ..... -$0.9
Decrease in Salary and Benefits (-$0.9) is a result of pay- freeze.

Chief Financial Officer (FY 2010 $62.9; FY 2012 $53.2) ..... -$9.7
The FY 2012 funding supports 243 full time equivalent employees (FTEs) and associated costs. The $1.1M decrease in salaries and benefits is due to a transfer of responsibility for Working Capital Fund federal salaries and benefits. The $0.2M decrease in travel is due to a focus on video and telephone conferencing. The $7M reduction in Other Related Expenses reflects a planned reduction in iManage developmental activities and low priority initiatives.

The $1.4M decrease in support services reflects an overall reduction in contractual services across the entire CFO organization.

Chief Information Officer (FY 2010 $103.1; FY 2012 $85.9) ..... -$17.2
The FY 2012 request for the OCIO is $85.9; this is a reduction of -$17.2 from the FY2010 current appropriation. The OCIO reorganized and in FY12 is moving from four decision units to three allowing for greater operational IT program support. Reductions in the Cyber program totaled -$11.4 with Policy, Guidance and Planning (PG&P) programs comprising the bulk of the reduction. The Program Direction decision unit is reduced by -$1.5 reflecting a decrease of 10 vacant positions. The budget supports 134 FTE's. The Corporate IT Program Support decision unit is reduced by -$4.2 reflecting a decrease in IT modernization and operational cyber security.

Office of Economic Impact and Diversity (FY 2010 $6.7 FY 2012 $7.5) ..... +$.8
This funding level supports salaries, benefits and associated costs for 32 FTE (+$1.7) to reflect the return of the EEOC and Diversity functions and 12 FTE to the Office, offset by decreases in the programmatic outreach efforts (-$0.6) number of technical assistance workshops for minority educational institutions (-$0.2). In addition, there were slight changes to business and community development (-$0.1), EEOC (-$0.1), and Environmental Justice (+$0.1).

General Counsel (FY 2010 $32.5; FY 2012 $34.6) ..... +$2.1
The increase reflects salaries and benefits due to promotions, and within-grade increases of 154 FTEs, plus the addition of 5 FTEs for the new GC Office of Enforcement that will ensure compliance of Departmental elements with the laws under which DOE operates; and one included in the transfer of all responsibilities for contractor labor standards and contractor labor relations to GC from the Office of Legacy Management.

Human Capital Management (**FY2010 $29.5; FY 2012 $23.1) ..... -$6.4**
This funding level supports salaries and benefits for 159 FTEs, a reduction of 14 FTEs. Beginning in FY 2012 approximately 10 FTEs will be funded through the WCF and 149 funded by HC; 10 funded via WCF; 159 total). (-$3.2). Other changes include: Travel (-$0.2); Support Services (-$3.1); Other Related Expenses (+$0.1).

Office of Management (FY 2010 $78.5; FY 2012 $62.7) ..... -$15.8
Decrease of $2.4M supports salaries, benefits for 290 FTEs, reduction of $11.8M in support service activities and $1.7M in other related expenses.

Office of Policy and International Affairs (FY 2010 $30.3; FY 2012 $28.8) ..... -$1.5
Change reflects reductions in program support activities and Salary and Benefits. Historically, program direction line items have not been budgeted to align with long-term actual costs. The FY12 PI budget corrects the mis-alignment between Program Direction budget and actual expenses.

Office of Public Affairs (FY 2010 $4.5; FY 2012 $3.8 ..... -**$0.7**
Decreases reflect a concerted effort to minimize travel requirements, reduce spending on duplicative and not-priority subscriptions, and a reduction in planned outreach and education campaign
(-$0.8). These decreases are offset by an increase due to funding an additional FTE from 25 to 26 (+$0.1).

Congressional and Intergovernmental Affairs (FY 2010 $4.8; FY 2012 $4.7) ..... **-$0.1**
Supports salaries & benefits for a total of 32 FTES in FY 2012 as well as office operation expenses.

Office of Indian Energy Policy & Programs (FY 2010 $5.5; FY 2012 $1.5) ..... **-$4.0**
Supports salaries & benefits for a total of 7 FTES in FY 2012, office operation expenses and Indian Energy Summit.

Cost of Work for Others (FY 2010 $47.5; FY 2012 $48.5) ..... +$1.0
The increase is due to additional costs associated with shipment of the Foreign Research Reactor Spent Nuclear Fuel from other countries.

Revenues (FY 2010 -$119.7; FY 2012 -$111.9) ..... +$7.8
The estimated revenues collected from other federal agencies as well as non-federal entities for Reimbursable activity conducted by the Department in accordance with full-cost recovery policy is decreasing from FY 2010 to FY 2012.

Defense Related Administrative Support (FY 2010 -$123.0; FY 2012 -$119.0) ..... +$4.0
Change reflects the proportional contribution from Other Defense Activities appropriation for Departmental Administration (DA) costs.

Inspector General

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010 $	FY 2012 vs. FY 2010 %
Office of Inspector General	51,927	51,927	41,774	-10,153	-19.6%
Total, Office Of The Inspector General	**51,927**	**51,927**	**41,774**	**-10,153**	**-19.6%**

PROGRAM DESCRIPTION

The **Office of the Inspector General** (IG) promotes the effective, efficient, and economical operation of the programs and operations of DOE, including the National Nuclear Security Administration and the Federal Energy Regulatory Commission, through audits, inspections, investigations and other reviews, while detecting and preventing fraud, waste, abuse, and violations of law. Additionally, in FY 2009, the OIG received $15 million from the American Recovery & Reinvestment Act. These funds are being used through FY 2012 to provide effective oversight of the Department's Recovery Act programs, grants and projects in an effort to protect taxpayer interests.

Statutory requirements direct the IG to conduct annual evaluation of DOE's information security systems as required by the Federal Information Systems Management Act of 2002. The IG is also charged with reviewing the Department's efforts to track and improve performance, per the Government Performance and Results Modernization Act of 2010. In addition, the IG conducts reviews of the most significant management challenges facing the Department. The total **FY 2012 request** for the Office of Inspector General is **$41.8 million**, which is a $10.1 million decrease from the FY 2010 enacted appropriation of $51.9 million. In FY 2010, the IG received $12 million for its use as the cost of DOE's annual financial statement audit, which was subsequently transferred to the Working Capital Fund. The FY 2012 funding level enables the IG to monitor and review programs with significant funding from the Recovery act and respond to the anticipated increases in hotline calls and reports.

PROGRAM HIGHLIGHTS

The FY 2012 request supports statutory requirements including work associated with the Federal Information Systems Management Act of 2002 to evaluate unclassified information systems and the Council of the Inspectors General on Integrity and Efficiency.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to 2012 Request ($ in millions)

Inspector General (FY 2010 $51.9; FY 2012 $41.8) ..... ……. -$10.1
Reflects decreased costs due to transfer of audit costs of the Working Capital Fund. Additional decreases reflect the federal pay freeze and the government-wide effort to reduce administrative costs.

Health, Safety and Security

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Health, Safety and Security	337,757	0	349,445	+11,688	+3.5%
Program Direction	104,125	0	107,037	+2,912	+2.8%
Congressionally Directed Projects	2,000	0	0	-2,000	-100.0%
Total, Health, Safety and security	**443,882**	**443,882**	**456,482**	**+12,600**	**+2.8%**

PROGRAM DESCRIPTION

The **Health, Safety and Security** program demonstrates the unwavering commitment of the U.S. Department of Energy to maintain a safe and secure work environment for all Federal and contractor employees; to ensure that its operations preserve the health, safety, and security of the surrounding communities; and protect the national security and other assets entrusted to the Department. HSS assists the Department in achieving its mission in a safe, secure, environmentally responsible manner by providing sound and consistent policy, technical assistance, training, independent oversight, enforcement, and corporate leadership for health, safety and security program areas. The total **request** for the program in **FY 2012** is **$456.5 million.**

PROGRAM HIGHLIGHTS

The **Health and Safety** subprogram provides technical and analytical expertise used to protect and enhance the safety of DOE workers, the public, and the environment in support of Departmental missions and goals. Policies and guidance are maintained for the promotion of safe, environmentally sustaining work practices throughout the Department to ensure best-in-class performance in the areas of occupational, facility, nuclear, and radiation safety; cultural and natural resources; environment; and quality assurance. Health and Safety provides assistance to DOE program and site offices and laboratories through site-specific activities such as nuclear facility safety bases reviews and through corporate-wide services such as accrediting commercial laboratories used by DOE sites for regulatory compliance and employee monitoring programs; maintaining radiological standards used to calibrate radiation monitors; and the operation of the Filter Test Facility. Other support is provided through the maintenance of corporate safety and environmental databases, administration of the accident investigation program, funding to the radiation emergency accident center, administration of the DOE voluntary protection program and development of environmental management systems. Health activities support domestic and international research pertaining to the exposures of workers and the public to nuclear, radiological, and other materials. Health and environmental services are also provided to the people of the Marshall Islands. This subprogram provides for medical screenings for former DOE and DOE-related vendor employees and supports the Department of Labor in implementation of the Energy Employee Occupational Illness Compensation ProgramAct. Health and Safety also provides support for the implementation of the Congressionally mandated worker safety and health, nuclear safety, and classified information security enforcement programs to ensure contractors' adherence to applicable regulations and promote proactive improvement of safety and security performance.

The **Security** subprogram provides technical and analytical expertise support to develop and assist in the implementation of safeguards and security programs that provide protection to national security and other vital national assets entrusted to the Department; and to implement the U.S. government's nuclear weapons-related technology classification and declassification program. Policies and guidance related to physical, personnel, and information security and nuclear materials accountability are maintained in order to be responsive to national security needs and changing threat environments. Assistance is provided to DOE program and site offices and laboratories to implement cost effective security measures tailored to mission accomplishment. Department wide assistance is provided via training programs to develop and maintain the proficiency and competency of DOE safety and security personnel. Corporate security-related information management systems are maintained to determine the potential for an undue risk to individual sites, the Department, and national security. The Security subprogram also provides for the protection of DOE facilities and information in the National Capital Area and access

authorization investigations for DOE Headquarters and other U.S. government personnel. Additionally, the information control program is implemented by DOE for the U.S. government to mitigate national security threats by preventing the release of information regarding weapons of mass destruction or other data that has the potential to damage the Nation's energy infrastructure and ensuring the release of information that is not sensitive.

Program Direction provides the federal staffing, travel, support services, and other resources and associated costs required to provide overall direction and execution of HSS activities. In addition, program direction provides for security; cyber security; emergency management and environment, safety, and health independent oversight performance assistance to senior Departmental leadership, program and site offices, and site contractors; Headquarters security support; and Defense Nuclear Facilities Safety Board issue resolution.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to 2012 Request ($ in millions)

The FY 2012 Health Safety and Security budget request is $456.5, an increase of $12.6, or 2.8% percent over the FY 2010 appropriated funding level.

Health, Safety, and Security (FY 2010 $339.8; FY 2012 $349. 5).....+$9.7
The overall funding increase is a result of an increase (+$37.01) in specialized security activities offset by decreased contractor support for policy, assistance, and corporate programs via operational efficiencies and increased reliance on the Federal workforce; a shift toward the conduct of targeted public health studies; an expected decrease in records searches associated with health compensation claims; Russian health studies continued change in phase from data collection to report writing; discontinuation of security technology deployment; deferment of purchasing security-related hardware; the transfer of the Nuclear Materials Management and Safeguards System and the Local Area Nuclear Material Accountability Software activities to the National Nuclear Security Administration; a reduced need for services associated with DOE HQ personnel access authorizations; and the absence of Congressionally directed funding (-$27.32)

Program Direction (FY 2010 $104.1; FY 2012 $107.0).....+$2.9
Overall funding increase reflects an increase in nuclear safety to satisfy recommendations made by the GAO and cyber security independent oversight activities ($6.0) and a working capital fund functional transfer; offset by a reduction of 22 FTEs; the freezing of Federal employee salaries; reduction in the use of contractors for Headquarters security operations activities, reduced travel; and reduction of other related expenses.

Hearings and Appeals

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Other Defense Activities					
Program Direction	6,444	6,444	4,142	-2,302	-35.7%
Total, Hearing and Appeals	**6,444**	**6,444**	**4,142**	**-2,302**	**-35.7%**

The **Office of Hearings and Appeals (OHA)** is responsible for all DOE adjudicative processes except those administered by the Federal Energy Regulatory Commission. OHA's jurisdiction includes Freedom of Information Act and Privacy Act appeals, evidentiary hearings to determine an employee's eligibility for a security clearance, appeals and initial agency decisions on contractor employee whistleblower complaints, agency decisions on whistleblower reprisal complaints arising under the American Recovery and Reinvestment Act, and requests for exception from DOE regulations and orders, such as exceptions from the appliance efficiency regulations. The FY 2012 request for OHA is $4.1 million, the decrease partly attributable to 9 employees being funded through the Office of Civil Rights.

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SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

Hearings and Appeals (FY 2010 $6.4; FY 2012 $4.1)..... -$2.3

The FY 2012 request supports salaries and benefits and cost of living expenses for 27 FTEs.

Federal Energy Regulatory Commission

(discretionary dollars in thousands)

	FY 2010 Current Approp.	FY 2011 Annualized CR	FY 2012 Cong. Request	FY 2012 vs. FY 2010	
				$	%
Federal Energy Regulatory Commission	298,000	0	304,600	+6,600	+2.2%
FERC Revenues	-298,000	0	-304,600	-6,600	-2.2%
Excess Fees and Recoveries, FERC Fees & Recoveries in Excess of Annual Appropriations	-10,933	-28,886	-25,072	-14,139	-129.3%
Total, Federal Energy Regulatory Commission	**-10,933**	**-28,886**	**-25,072**	**-14,139**	**-129.3%**

PROGRAM DESCRIPTION

The **Federal Energy Regulatory Commission (FERC or the Commission)** is an independent agency that regulates the interstate transmission and wholesale sales of electricity; the transmission and sale of natural gas for resale in interstate commerce; and the transportation of oil by pipeline in interstate commerce. FERC also reviews proposals to build liquefied natural gas (LNG) terminals as well as interstate natural gas pipelines and licenses and inspects hydropower projects. The Commission protects the reliability of the Nation's bulk-power system and oversees environmental matters related to natural gas and hydroelectric projects. The Commission enforces its regulatory requirements on jurisdictional entities through civil penalties and other means.

FERC's mission is to assist consumers in obtaining reliable, efficient and sustainable energy services at a reasonable cost through appropriate regulatory and market means. FERC seeks to ensure that rates, terms and conditions of service are just, reasonable and not unduly discriminatory or preferential, relying on competitive markets where appropriate. Through its oversight and enforcement authorities, FERC seeks to increase compliance with its rules and regulations and deter market manipulation. FERC's responsibilities also include promoting the development of safe, reliable and efficient infrastructure that serves the public interest.

PROGRAM HIGHLIGHTS

To ensure just and reasonable rates, terms and conditions of service, the Commission will rely on competition and appropriate regulatory policies. Competition will benefit energy consumers by encouraging new entry among supply-side and demand-side resources, spurring innovation and deployment of new technologies, improving operating performance and exerting downward pressure on costs. The Commission will pursue policy reforms to ensure that all types of resources operate on a level playing field in jurisdictional markets.

The Commission's reforms will specifically address the emergence of demand resources and renewable resources, barriers to participation by such resources in wholesale electric markets and best practices in organized markets to help achieve the potential benefits associated with demand response. The Commission ensures that its market and other regulatory rules are clear, enforceable, and fully understood by the regulated entities. While the obligation to comply with those rules lies with the regulated entity itself, the Commission is actively pursing a strategy to promote rigorous internal compliance programs. The Commission identified elements of an effective compliance program and is engaged with regulated entities to create a "culture of compliance."

In its enforcement role, the Commission takes proactive steps to reduce the probability that violations will occur, including conducting compliance audits and performing investigations. FERC will continue to place additional emphasis on activities that disrupt or impair the functioning of competitive energy markets. Where appropriate, FERC will exercise its civil penalty authority of up to $1 million per day for the duration of the violation. Penalties of this magnitude are applicable to any entity that manipulates wholesale gas or electric markets by engaging in fraud or deceit in connection with jurisdictional transactions.

The Commission has an important role in the development of an efficient, safe and reliable energy infrastructure. As directed by Congress, FERC will adopt standards and protocols to govern the implementation of smart grid technologies that can enhance the reliability and efficiency of the Nation's electric transmission grid operations. The Commission also will implement rate treatment policies that support certain investments in smart grid technologies. FERC will continue to support an open and transparent electric transmission planning process. Such coordination between transmission providers will support the development of an efficient transmission system and enhance competition in wholesale electric markets.

The Commission's infrastructure siting authority rests in licensing non-federal hydropower projects, certificating interstate natural gas pipelines and storage projects, authorizing liquefied natural gas (LNG) facilities and, in certain circumstances, permitting electric transmission lines. Post-authorization, the Commission relies heavily on physical inspections of hydropower and LNG facilities to ensure safety.

Maintaining the reliability of the Nation's electric transmission grid is a critical responsibility of the Commission. FERC will oversee the development and enforcement of mandatory electric reliability standards and critical infrastructure protection standards.

SIGNIFICANT FUNDING CHANGES – FY 2010 Appropriation to FY 2012 Request ($ in millions)

FERC (FY 2010 $298.0; FY 2012 $304.6) ..... +$6.6
The FY 2012 request funds 1,500 FTEs that will support FERC in its reliability and critical infrastructure protection standards development and compliance processes; infrastructure siting and inspection responsibilities; enforcement efforts; and policy reforms related to renewable resources and advanced technologies. FERC will recover the full cost of its operations through a system of annual charges and fees, resulting in a net appropriation of $0 for FY 2012.