Department of Energy
Five Year Plan
FY 2007-FY 2011
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Executive Summary
Five Year Plan
FY 2007-FY 2011

INTRODUCTION

The enclosed documents are provided in response to the Conference Report (H.R. 109-275) accompanying the Energy and Water Development Appropriations Act, 2006, (Public Law 109-103). The Conferees requested the Department to submit detailed five-year budget plans for all major programs including business plans for each of the Department's laboratories.

RESULTS IN BRIEF

Over the last five years America has faced and overcome many challenges. From the U.S./Canada Power Blackout of August 2003, to the devastation caused by hurricanes Katrina and Rita, now more than ever, American families understand the key relationship between our Nation's energy security and America's economic security.

The Administration recognizes that energy is central to our economic and national security. Indeed, energy helps drive the global economy and has a significant impact on our quality of life and the health of our people and our environment. The enclosed plans balance the need to address short-term challenges while planning for long-term actions, while appropriately recognizing the importance of prioritization. These plans continue the investments contained in the President's Fiscal Year (FY) 2007 budget request for the Department of Energy.

These investments include promoting science and technological innovation – by doubling funding for innovation-enabling research at key Federal agencies that support high-leverage fields of physical science and engineering over the next 10 years, which includes the Department's Office of Science; advancing America's economic and energy security – through strategic investments in the research and development of advanced clean energy technologies (e.g., nuclear, solar, biomass, hydrogen fuel cells, clean coal) designed to reduce America's dependence on foreign oil and diversify our domestic energy supplies; advancing America's national security – by transforming the Nation's nuclear deterrent to be more responsive to the threats of the 21st Century and to mitigate the threat of weapons of mass destruction; and ensuring a clean environment - by addressing the environmental legacy of the Cold War and establishing a permanent nuclear waste repository at Yucca Mountain, Nevada.

The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, the Office of Management and Budget's (OMB) computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense,

homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

In creating the approach for the multi-year plans, the Department developed two plans; Target Scenario and Above Target Scenario. The Target Scenario is consistent with the place-holder out-year forecast presented in the FY2007 President's Budget, and the Above Target Scenario uses the out-year forecast as a starting point from which to build. Both scenarios use the President's Budget FY2007 request as a starting point to guide the planning estimates for FY2008 through FY2011.

The Target Scenario is based on macro-economic assumptions and estimates for discretionary spending at the Federal level. In this scenario, we present out-year profiles by program building on the FY2007 request level. In the target case, out-year estimates for programs are formulaic driven, with certain exceptions, such as Science, which reflects an increased level to spur economic competitiveness and advance scientific and technological innovation. As much as possible, key program initiatives were funded within the out-year formulaic target levels, an example being the Office of Energy Efficiency and Renewable Energy, which funded various technology initiatives in the President's Advanced Energy Initiative (i.e., biomass, solar, wind, hydrogen, and fuel cell vehicles) within targeted levels. Of note, the Environmental Management activities are also estimated at target, and are based on the previously planned accelerated site closure strategy. The Department is currently updating these assumptions to reflect known changes in the regulatory and statutory requirements, incorporate changes based on actual program performance, and to incorporate technological and acquisition strategies to meet the Department's long-term environmental commitments.

For the National Nuclear Security Administration (NNSA), the statutory Future Years Nuclear Security Program (FYNSP), integrated into the President's FY2007-2011 Budget Request, reflects the out-year estimates for all NNSA programs at a single "target" funding scenario. NNSA provides program-by-program out-year projections to meet national security priorities to DOE, and then to the Administration as part of the OMB Budget Request.

The Above Target Scenario uses the FY2008 through FY2011 out-year targets as the baseline and show the programmatic impacts if additional resources were provided above the target. In total, over the four-year period from FY2008-2011, the Above Target Scenario shows the effects of an additional $6.8 billion for such programs as the Global Nuclear Energy Partnership, Yucca Mountain's spent nuclear fuel and high level waste disposal activities, and the Clean Coal Power Initiative.

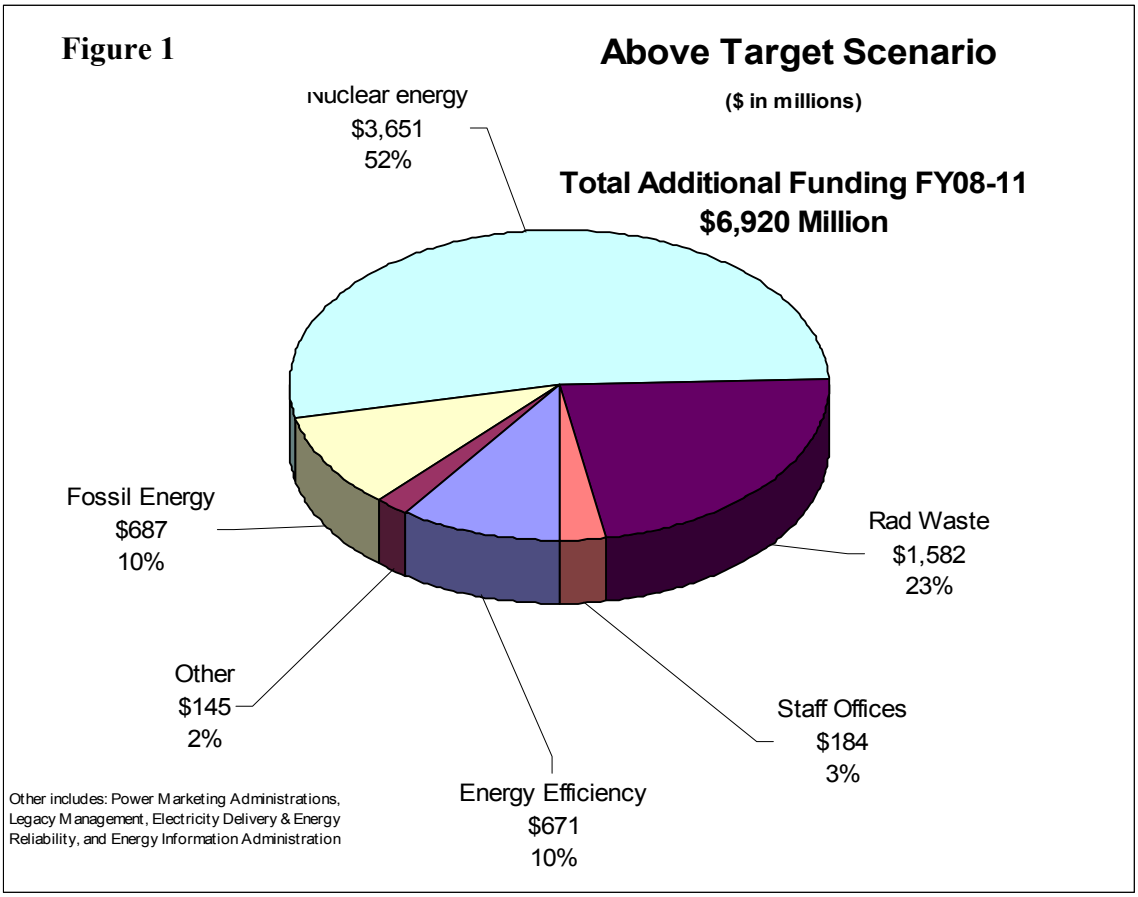
Table 1. ***Five Year Plan Funding Summary*** provides a crosswalk from the target level funding scenario to the Above-Target Scenario. The goals, activities, and priorities associated with these funding levels will serve to inform the detailed resource allocation decisions that occur annually during formulation of the President's Budget.

Table 1. Five Year Plan Funding Summary

($ in millions)	FY 2008	FY 2009	FY 2010	FY 2011	FY08-11
Current DOE Target	$ 23,413	$ 23,769	$ 23,857	$ 24,572	$ 95,611
Nuclear Energy	$ 617	$ 818	$ 989	$ 1,227	$ 3,651
Radioactive Waste Management	$ 135	$ 440	$ 554	$ 453	$ 1,582
Fossil Energy	$ 148	$ 136	$ 226	$ 177	$ 687
Energy Efficiency	$ 111	$ 162	$ 203	$ 195	$ 671
Other Programs	$ 46	$ 41	$ 42	$ 16	$ 145
Staff Offices	$ 35	$ 39	$ 51	$ 59	$ 184
Revised Over Target Funding	$ 24,505	$ 25,405	$ 25,922	$ 26,699	$ 102,531
Delta (current plus priorities)	$ 1,092	$ 1,636	$ 2,065	$ 2,127	$ 6,920

Figure 1. Above Target Scenario, shows the incremental funding above-target by Departmental element. These planning estimates are the most recent forecast for additional spending options within the planning horizon. The total above-target increment for the FY2008 – FY2011 timeframe is $6.8 billion, an average of roughly $1.7 billion per year. The majority of this increase (75%) would enhance or accelerate our efforts to promote clean, safe, nuclear energy and the development of the repository for nuclear waste.

Figure 1



Nearly $3.7 billion (52%) is for advanced research and development (R&D) programs including the Global Nuclear Energy Partnership (GNEP), a part of the Advanced Fuel Cycle Initiative; Generation IV (Gen IV); Nuclear Power 2010 (NP 2010); and infrastructure at the Idaho National Laboratory to support these programs. The additional funding for the Yucca Mountain repository, including the transportation infrastructure across the nation and within Nevada, is $1.6 billion (23%).

Other significant out-year funding increases within the Above-Target Scenario include: enhanced support for the Clean Coal Power Initiative (Fossil Energy); energy efficiency grants, technical assistance and outreach programs (Energy Efficiency and Renewable Energy); and a variety of enhancements to the nation's electricity supply and distribution infrastructure. Specific details are provided within the body of the report.

Embodied in the Five Year Plans are the integration of performance measures and the incorporation of sound business practices in the Department's operation to improve consistency with the President's Management Agenda. We also have established straightforward operating principles which set the tone for enhanced management of the Department. These principles are:

- Ensure safe, secure, and environmentally responsible operations

- Act with a sense of urgency
- Work together
- Treat people with dignity and respect
- Make the tough choices
- Keep our commitments
- Embrace innovation
- Always tell the truth
- Do the right thing

CONCLUSION

The Administration recognizes that energy is central to our economic and national security and has a significant impact on our quality of life and the health of our people and our environment. The enclosed Five Year Plans balance the need to address short-term challenges while planning for long-term actions, recognizing the importance of prioritization.

These plans illustrate the Department's commitment to meeting the nation's energy challenges. They provide a multi-year context and establish a consistent planning basis for allocating financial resources to our most compelling priorities.

BACKGROUND AND PROCESS

The Department's five-year planning initiative is designed to:

- Apply resources to priorities
- Improve departmental performance by increasing focus on the mission critical activities required to meet the Department's strategic goals and objectives

The first enclosure is the Department's integrated Five Year Plans (FYP) for all programs and staff offices. The Department developed the FYPs using two funding scenarios. The first scenario, called "Target," builds upon the mechanistic out-year funding profiles, and DOE's FYPs are consistent with the overall Federal discretionary estimates submitted in early February. The second scenario, called "Above-Target," outlines additional programmatic accomplishments that could be achieved with funding increments above the Target scenario in FY2008 and beyond. In both scenarios, choices were made based on priorities. To the most reasonable extent possible, key program activities were funded within the target levels.

The Department's FYPs include a narrative section that addresses: program mission, strategic goal, program priorities and assumptions, reallocations, and annual performance targets. There is explicit discussion on trade-offs and reallocations within the body of each individual Program FYPs.

The Department considers NNSA's Future Years Nuclear Security Program (FYNSP), which is incorporated into the Department's Congressional Budget Request, sufficiently addresses the requirements in the Report language for five-year budget plans. In addition, an addendum to the FYNSP has been included in the FYPs that present the NNSA process to integrate competing priorities into the final Departmental budget. It also discusses, in general terms, the funding tradeoffs and reallocations that were made to support these priorities.

The second enclosure is the Department's laboratory business plans for the Office of Science, Environmental Management, Fossil Energy, Energy Efficiency and Renewable Energy, Nuclear Energy, Science and Technology, and the National Nuclear Security Administration. The lab plans include a vision statement, description of the primary and secondary mission, core competencies/capabilities, major activities, and priorities. The lab plans outline the functions performed and provide an opportunity to help eliminate redundancy among the various labs.

ADDITIONAL DATA

Table 2. Target Level Funding Summary. The following table provides the breakdown of the Target level funding scenario by organization.

Funding By Organization	FY 2007 Congressional Request	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Nuclear, Energy, Science and Technology	$ 632,698	$ 612,769	$ 610,367	$ 603,091	$ 611,019
Civilian Radioactive Waste Management	$ 544,500	$ 526,000	$ 523,000	$ 516,000	$ 522,000
Fossil Energy	$ 648,876	$ 775,000	$ 624,000	$ 615,000	$ 623,000
Energy Efficiency and Renewable Energy	$ 1,176,421	$ 1,137,054	$ 1,130,938	$ 1,115,647	$ 1,129,103
Electricity Delivery & Energy Reliability	$ 124,928	$ 120,748	$ 120,098	$ 118,475	$ 119,903
Power Marketing Administrations	$ 251,975	$ 245,000	$ 243,000	$ 240,000	$ 243,000
Energy Information Administration	$ 89,769	$ 87,000	$ 87,000	$ 85,000	$ 86,000
Legacy Management	$ 200,990	$ 197,124	$ 198,121	$ 197,690	$ 201,577
Departmental Staff	$ 680,444	$ 669,305	$ 673,476	$ 674,097	$ 687,398
Science	$ 4,101,710	$ 4,366,000	$ 4,647,000	$ 4,947,000	$ 5,265,000
National Nuclear Security Administration	$ 9,315,811	$ 9,502,000	$ 9,692,000	$ 9,886,000	$ 10,084,000
Environmental Management	$ 5,828,038	$ 5,212,567	$ 5,257,129	$ 4,896,580	$ 5,036,548
Other Adjustments	$ (39,405)	$ (37,000)	$ (37,000)	$ (38,000)	$ (37,000)
Total, Target Level Funding	$ 23,556,755	$ 23,413,567	$ 23,769,129	$ 23,856,580	$ 24,571,548

***Other Adjustments (Colorado River Basins and Federal Energy Regulatory Commission)**

Office of Energy Efficiency and Renewable Energy
Five Year Plan
FY 2007 – FY 2011

OVERVIEW:

The mission of the Office of Energy Efficiency and Renewable Energy (EERE) is to strengthen America's energy security, environmental quality, and economic vitality through public-private partnerships that promote energy efficiency and productivity, bring clean, reliable, and affordable energy technologies to the marketplace, and make a difference in the everyday lives of Americans by enhancing their energy choices and quality of life.

The Department of Energy seeks to add significant value to national and economic security by providing increased energy security and a healthy environment. Technologies developed by EERE provide a diverse supply of reliable, affordable, and environmentally sound energy through investment, development, and partnership in a focused and prioritized portfolio of energy conservation technologies and clean, renewable domestic energy resources. Research advancing these energy technologies provides consumers choices they can use to make their homes, schools, businesses, factories and vehicles more productive. Developing renewable sources of energy can enhance the Nation's energy security and economic growth by harnessing abundant, naturally occurring, domestic sources of energy that expand our energy resource base and have less impact on the environment than conventional sources. The balanced and focused portfolio of research, development, demonstration and deployment programs supported by EERE is an important contributor to the development and use of applied energy science and R&D to achieve energy solutions. The ability to make and effect sound energy policy depends on productive investment in a diverse technology portfolio that will efficiently and effectively address the complex requirements for simultaneously improving national energy security, providing for a cleaner environment, and ensuring continued economic growth. Energy pathway choices the United States makes today will have lasting implications for decades to come. Thus, developing advanced, efficient and affordable clean energy technologies now are critical for this and future generations—the EERE portfolio approach is at the forefront of those efforts. In this Five Year Plan, EERE continues to refine its program portfolio to accelerate and expand contributions to those critical national objectives, developing renewable energy and efficiency technologies and processes with the energy use and partnering community to enable use in homes, schools, businesses, factories and vehicles.

[1]Office of Energy Efficiency and Renewable Energy Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	1,148,443	1,176,421	1,137,054	1,130,938	1,115,647	1,129,103
Above Target (FY 2007 -2011)	1,148,443	1,176,421	1,247,799	1,292,919	1,319,087	1,324,304

1The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

HYDROGEN TECHNOLOGY

Mission and Goals

The mission of the Hydrogen Technology Program (HT) in DOE's Office of Energy Efficiency and Renewable Energy is to research, develop, and validate fuel cell and hydrogen production, delivery, and storage technologies. The program aims to have hydrogen from diverse domestic resources used in a clean, safe, reliable, and affordable manner in fuel cell vehicles and stationary power applications. The key Hydrogen Technology contribution to General Goal 4, Energy Security, is domestic energy supply and energy efficiency through:

- Hydrogen production and delivery R&D for market-based technologies that will reduce the cost of producing hydrogen from renewables (in a distributed system) from $6.20/ gallon of gasoline equivalent (gge) in 2003 to $2.85/gge untaxed, delivered (at 5000 psi) by 2010; and Hydrogen production and delivery R&D for market-based technologies that will reduce the cost of producing hydrogen from natural gas (distributed) from $5.00/gge in FY 2003 to $2.50/gge (at 5,000 psi) in FY 2010 untaxed at the station with high equipment manufacturing volumes (i.e.500 units/year);
- Hydrogen storage R&D to develop and demonstrate commercially-viable hydrogen storage technology that enables greater than 300-mile vehicle driving range, while meeting vehicular packaging, cost and performance requirements. Specifically, develop and demonstrate by 2010 a hydrogen storage technology with capacity of 2.0 kWh/kg (6% by weight), compared to 0.5-1.3 kWh/kg in 2003, and 1.5 kWh/l (kilowatt-hours per liter), compared to 0.5-0.6 kWh/l in 2003;
- Transportation Systems/Fuel Cell Stack Component R&D will improve fuel cell durability and performance while reducing cost. The manufacturing cost of hydrogen-fueled fuel cell power systems will be reduced from $275/kW in 2002 for a 50 kW system to $45/kW in 2010 for an 80 kW system at production levels of 500,000 units per year (projected cost);
- Distributed Energy Systems/Fuel Processor R&D will increase the electrical efficiency of 5-250 kW stationary fuel cell systems operating on natural gas or propane from 29 percent in 2002 to 40 percent in 2011;
- Technology Validation will verify under real world conditions: hydrogen fuel cell vehicle performance and 2,000 hour durability; and hydrogen infrastructure technologies with a cost of $3.00 per gge with 68 percent well-to-pump efficiency in 2009;
- Education activities will increase the understanding of the hydrogen economy and hydrogen technologies among key target audience groups including local and state governments, safety and code officials, potential end-users, local communities, and students and teachers. By 2011, the program expects to significantly increase the subject knowledge among these target audiences, relative to 2004 baseline survey results, and thereby facilitate the success of near-term hydrogen technology demonstrations as well as accelerate the market adoption of hydrogen technologies over the long-term; and
- Underlying research for safety and codes and standards that will enable preparation of a global technical regulation (GTR) for hydrogen fuel cell vehicles and infrastructure (GTR

expected to be submitted in draft in 2008; approval anticipated in 2010). Global consistency in standards will ensure that different technologies need not be developed for each region of the world.

Hydrogen Technology Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	155,627	195,801	226,000	258,000	293,000	323,000

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

The President's Hydrogen Fuel Initiative (HFI) commits $1.2 billion over FY 2004 – FY 2008 for hydrogen and fuel cell research to reverse America's dependence on oil and improve the environment. That commitment represents a $720 million increase over FY 2004 baseline budget assumptions, accelerating hydrogen and fuel cell R&D to enable an industry commercialization decision by 2015 and leading to vehicles in the showroom by 2020. The out-year table above shows the initial estimates of the funding needed in FY 2008-2011 for the Hydrogen Technology portion of HFI (EERE) to reach the 2015 and 2020 program goals in the Energy Policy Act of 2005 and to achieve the President's vision. These funding estimates are within the authorized appropriations in the Energy Policy Act of 2005.

The relative funding levels shown in the table may change to a degree as a result of further cost analysis, future appropriations and R&D results. The out-year funding totals are fully supportive of Title VIII of the Energy Policy Act of 2005 and are also responsive to the recommendations of the National Academies and the National Research Council.[1]

The HFI makes extensive use of peer review and advisory committees for input into the development of R&D investments, identification of priorities, and in the selection of competitively awarded projects. In addition to the Annual Peer Review process and reviews by the National Academies, HFI is currently establishing a Hydrogen Technical Advisory Committee (HTAC), as required by section 807 of the Energy Policy Act of 2005.

PRIORITIES:

The increases in out-year budget plans support a prioritized research and development effort focused on critical path technologies in fuel cells, hydrogen storage, hydrogen production, and safety, as well as data collection and testing of hydrogen fuel cell vehicles through the national "Learning Demonstration" project. The funding of these critical path technologies is necessary to achieve major 2010 technical targets and keep the 2015 commercialization decision on schedule:

1 As documented in the February 2004 National Academies' report, "The Hydrogen Economy: Opportunities, Cost, Barriers and R&D Needs (National Academies Press, Washington, DC) and in the August 2005 National Research Council report "Review of the Research Program of the FreedomCAR and Fuel Partnership: First Report."

- Fuel Cell Technology – Cost reduction and improvements to durability are emphasized to ensure fuel cell vehicles will be competitive with conventional and hybrid vehicle technology.
- Hydrogen Storage – Improvements in the amount of hydrogen that can be safely stored onboard the vehicle is required to allow for a competitive driving range, at least 300 miles. Current compressed gas technology limits range to 150-200 miles.
- Hydrogen Production – Displacing imported petroleum with hydrogen without transferring dependency to another feedstock depends on the ability to economically produce hydrogen from multiple feedstocks. The Hydrogen Technology Program is focusing hydrogen production R&D on renewable, domestic pathways such as photoelectrochemical, solar thermochemical and biological processes.
- Safety – For consumers to adopt hydrogen technology, it must be as safe as currently used fuels such as gasoline and natural gas. The Hydrogen Technology Program is facilitating the development of the codes and standards required for consumer use and through the development of "best practices" that will ensure safe introduction of this fuel.
- Learning Demonstrations – The Technology Validation program element is focusing on conducting learning demonstrations that emphasize co-development and integration of hydrogen refueling infrastructure in parallel with hydrogen fuel cell vehicles. Testing and validation of these technologies produce the data required to refocus R&D as appropriate.

Reallocations to Support EERE Priorities:

EERE has made reductions and close-outs within its portfolio to support greater investments in advanced R&D to address critical national priorities such as dependence on oil, accelerating the development of clean electricity supply options, and developing highly efficient new technologies for buildings.

Changes to overall requested funding levels and shifts between and within subprograms are possible. The shifts will be based on results achieved towards meeting established goals and technical targets.

HYDROGEN TECHNOLOGY

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.01.00.00 (Hydrogen Technology)				
Hydrogen Production and Delivery R&D: Renewable				
Complete lab-scale electrolyzer, test to determine whether it achieves 64% energy efficiency and evaluate systems capability to meet $5.50/gge hydrogen cost target, untaxed at the station, and with large equipment production volumes [e.g., 500 units/year].	Decision to go or not to go forward with high temperature electrolysis technology R&D based on a complete technoeconomic analysis and laboratory-scale research results.	Down-select biomass-to-hydrogen reforming, water-gas-shift and separation technologies with potential to meet a cost of $3.60/gge in 2009.	Complete research using biomass feedstock to combine reforming, water-gas shift, separations and purification with gasification/pyrolysis processes and delivery technologies to achieve a cost of $3.60/gge at the station.	Verify biomass combined reforming, water-gas shift, separations and purification with gasification/pyrolysis processes and delivery technologies to achieve a cost of $3.60/gge at the station.
Hydrogen Production and Delivery R&D: Non-Renewable				
Complete preliminary lab scale tests to identify technologies that produce 5,000 psi hydrogen from natural gas for $2.50/gge, untaxed at the station and with large equipment production volumes [e.g., 500 units/year].	Complete preliminary research and development to produce 5,000 psi hydrogen from natural gas for $2.50 per gallon of gasoline equivalent, untaxed at the station, and with large equipment production volumes [e.g., 500 units/year].	Develop a laboratory-scale distributed natural gas-to-hydrogen production and dispensing system that can produce up to 5,000 psi hydrogen for $2.50/gge.	Verify laboratory-scale distributed natural gas-to-hydrogen production and dispensing system that can produce 5,000 psi hydrogen for $2.50/gge.	Begin preliminary lab scale tests to identify technologies that produce 10,000 psi hydrogen from natural gas for $2.00 / gge untaxed at the station, and with large equipment production volumes [e.g., 500 units/year].
Hydrogen Storage R&D: Materials-based				
Complete baseline on-board storage systems analyses, down select materials, and evaluate against 2007 targets of 1.5 kWh/kg (4.5% by weight) and 1.2 kWh/L.	Demonstrate chemical hydrogen storage regeneration process at laboratory-scale, determine efficiency and projected costs; and evaluate potential to meet 2010 cost target of $4/kWh.	Complete chemical hydrogen storage life cycle analyses and down select storage approaches with potential to meet 2010 targets of 2.0 kWh/kg (6% by weight) and 1.5 kWh/l.	Complete fabrication of hydrogen storage system prototype and evaluate against 2010 targets of 2.0 kWh/kg (6% by weight) and 1.5 kWh/l.	Complete testing of hydrogen storage system prototype and verify hydrogen storage capacities at independent test laboratory, evaluating against targets of 2.0 kWh/kg (6% by weight) and 1.5 kWh/l.
Technology Validation				
Validate achievement of a refueling time of 5 minutes or less for 5 kg of hydrogen at 5,000 psi through the use of advanced sensor, control, and interface technologies.	Fuel Cell vehicle(s) demonstrate the ability to achieve 250 mile range without impacting cargo or passenger compartments.	Operate fuel cell vehicle fleets to determine if 2,000 hour vehicle fuel cell durability, using fuel cell degradation data, was achieved by industry.	Demonstrate the ability to produce 5,000 psi hydrogen from natural gas for $2.50 per gallon of gasoline equivalent, untaxed at the station, and with large equipment production volumes [e.g., 100 units/year].	Validate Cold start capability at -20 C in 30 seconds and -40 C survivability.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Transportation Fuel Cell Systems and Fuel Cell Stack Component R&D				
DOE-sponsored laboratory scale research will reduce the modeled technology cost to $90/kW for a hydrogen-fueled 80kW fuel cell power system.	DOE-sponsored research will reduce the modeled technology cost of a hydrogen-fueled 80kW fuel cell power system to $70/kW.	DOE-sponsored research will reduce the modeled technology cost of a hydrogen-fueled 80kW fuel cell power system to $60/kW.	DOE-sponsored research will reduce the modeled technology cost of a hydrogen-fueled 80kW fuel cell power system to $45/kW.	DOE-sponsored research will reduce the modeled technology cost of a hydrogen-fueled 80kW fuel cell power system to $42/kW.
Distributed Energy Systems and Fuel Processor R&D				
DOE-sponsored research will improve electrical efficiency to 34 percent at full power for a natural gas or propane fueled 5-250 kW stationary fuel cell power system verified by a prototype (5-50 kW system).	DOE-sponsored research will improve electrical efficiency to 35 percent at full power for a natural gas or propane fueled 5-250 kW stationary fuel cell power system verified by a prototype (5-50 kW system).	DOE-sponsored research will improve electrical efficiency to 36 percent at full power for a natural gas or propane fueled 5-250 kW stationary fuel cell power system verified by a prototype (5-50 kW system).	DOE-sponsored research will improve electrical efficiency to 38 percent at full power for a natural gas or propane fueled 5-250 kW stationary fuel cell power system verified by a prototype (5-50 kW system).	DOE-sponsored research will improve electrical efficiency to 40 percent at full power for a natural gas or propane fueled 5-250 kW stationary fuel cell power system verified by a prototype (5-50 kW system).
Education				
N/A	Complete Hydrogen Education Survey to demonstrate an increase in technical knowledge of hydrogen technologies among key target audiences.[1]	N/A	N/A	Complete Hydrogen Education Survey to demonstrate an increase in technical knowledge of hydrogen technologies among key target audiences.
Safety and Codes and Standards				
N/A	Hydrogen materials technical reference completed which reports on embrittlement issues for hydrogen usage up to 10,000 psi delivered. Publish a Best Practices Manual describing hydrogen safety guidelines and lessons learned.	Final draft standard available for balloting for portable fuel cell technology.	A Global Technical Regulation for hydrogen vehicles has been drafted and available for adoption by the United Nations Economic Commission for Europe (ECE-WP29/GRPE).	Final hydrogen fuel quality standard available for adoption by the International Standards Organization.
Systems Analysis				
N/A	N/A	Complete feedstock, capital, capacity and utility sensitivity analyses on the cost of delivered hydrogen of 6 pathways using the Macro-System Model.	Complete well-to-wheels greenhouse gas emissions analysis of 6 pathways with the Macro-System Model at various vehicle penetration levels. Complete hydrogen quality impact study of the components of 6 pathways.	Complete 5 transitional analyses of 6 pathways using the Macro-System Model to provide feedstock, optimum infrastructure requirements and hydrogen delivery volumes at various vehicle penetration levels.

1 The Hydrogen Baseline Knowledge Assessment conducted in 2004 surveyed four target audiences' understanding of a hydrogen economy and hydrogen technologies. Target audiences include state and local governments, the general public, end-users, and students. Increases in technical knowledge are measured according to responses to 11 technical questions in each assessment.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.

BIOMASS AND BIOREFINERY SYSTEMS R&D

Mission and Goals

The mission of the Biomass and Biorefinery Systems R&D Program ("Biomass Program") is to reduce our dependence on imported oil by funding research and development on advanced technologies that will convert our Nation's biomass[1] resources into affordable industrial products (including energy and higher value chemicals and materials) through the development of multi-product, high efficiency, high through-put, biorefineries.[2] An analogy to this approach is the petroleum refinery that refines crude oil into a broad range of industrial products.

The program directly supports General Goal 4, Energy Security principally by increasing the production of biomass-based substitutes for petroleum-derived fuels, chemicals, materials, and heat and power, and thereby diversifying and expanding energy supply. It also addresses the goals and recommendations of the Biomass R&D Act of 2000, the Farm Security and Rural Investment Act of 2002, and the Energy Policy Act of 2005 (EPAct 2005). In support of these goals, the President's Biofuels Initiative will accelerate development of advanced technologies for conversion of a variety of lignocellulosic feedstocks to biofuels and products resulting in an ethanol cost of $1.07 by 2012 and production of 60 billion gallons of biofuels by 2030.

In order to increase the probability of success, the program funds key technology pathways that contribute to the achievement of this goal:

Feedstock Infrastructure contribution:

- Reduce biomass harvesting and storage costs so that the delivered cost will be reduced from $53 per dry ton in 2003 to $35 per dry ton by 2012. Indicators of progress toward that goal include developing a conceptual, novel harvesting system, pre-processing assembly system and testing a wet storage system by 2009.

Platforms Research and Development contribution:

- The program will continue to focus biochemical conversion R&D towards reducing the cost of producing mixed, dilute sugars to enable biorefinery pathways. The overarching barrier in the biochemical conversion platform is the recalcitrance of biomass (i.e., when compared to starch, cellulose is not easily broken down into sugars). The program will accelerate reductions in the cost of mixed sugars by integrating its enzyme cost reduction accomplishments with advances in other process steps. The program will orient thermochemical R&D towards developing technologies for biorefinery pathways that convert process residues in biochemical biorefineries, forest resources, and pulping liquors into clean syngas and bio-oils for further synthesis into fuels and chemicals. The mid- and long-term goals are the use of the maximum variety of feedstocks to produce fuels, power, and chemicals in stand alone facilities or incorporated with other conversion technologies into biorefineries.
- The Biochemical Platform R&D effort is targeted to reduce the estimated cost for production of a mixed, dilute sugar stream suitable for fermentation to ethanol from agricultural residues, forestry residues, and perennial crop pathways. For agricultural

1 Biomass means any organic matter that is available on a renewable or recurring basis, including agricultural crops and trees, wood and wood wastes and residues, plants, grasses, residues, fibers and animal wastes, municipal solid wastes, and other waste materials.

2 Biorefineries are processing facilities that extract carbohydrates, oils, lignin, and other materials from biomass, convert them into multiple products such as transportation fuels, power, and products.

residues, with a base of 15 cents/lb in FY 2003 (corresponding to $2.75 per gallon of ethanol at $53 per dry ton of corn stover), the goal is to reduce costs to 6.4 cents/lb by FY 2012 (corresponding to $1.07 per gallon of ethanol at $35 per dry ton of corn stover). Indicators of progress will be bench-scale data (FY 2007) and economic and technological validation (FY 2012) to support and enable the commercialization of the technologies. The continued progress will not only enable additional pathways to be developed, but will also drive the economics to the ultimate goal of greenfield lignocellulosic conversion facilities.

- The Thermochemical Platform R&D will initially focus on the utilization of non-fermentable process residues in biorefineries (off-spec feedstock, low quality biomass, and lignin-rich residues) to provide clean syngas, in support of 60 billion gallons of biofuels production by 2030. With a base of $7.25 per million Btus in FY 2005 (corresponding to 6.86 cents per kWh of electricity), the goal is to reduce syngas cost to $5.25 per million Btus (corresponding to 6.18 cents per kWh of electricity) in FY 2011.

Utilization of Platform Outputs R&D contribution:

- In view of the integrated biorefinery emphasis, the current budget request focuses on the conversion of sugars and syngas, the biorefinery intermediate products, into transportation fuels (including ethanol from residual starch and cellulose), heat, power, and various chemicals. For the near term biorefinery pathways (wet mills, dry mills, and oilseeds), validation will be pursued through the commercial-scale projects scheduled to be initiated in FY 2007. In accordance with the EPAct 05, Section 932, selected proposals from a solicitation for the demonstration of advanced biorefineries using lignocellulosic feedstocks will be funded. Products development work consists of cost shared development and demonstration of high value chemicals and materials from biomass, including corn starch and agricultural residues. Additional, accelerated efforts in fermentation microorganism development through public/private partnerships will be conducted.

An indicator of progress toward achieving those benefits includes:

- In FY 2008, complete a preliminary engineering design package, market analysis, and financial projections for at least 2 industrial-scale projects for additional agricultural pathways (corn wet mill, corn dry mill, oilseed, forest residues, etc.) to produce 1 to 5 million gallons of biofuels per year using advanced production techniques, cellulosic feedstock conversion, and/or featuring the production of co-products in addition to biofuels. The intent is to provide proof that the resultant industrial scale biorefineries could commercially produce and market biofuels at prices competitive (on an integrated systems basis) with petroleum fuels produced from $50 per barrel oil.

Biomass and Biorefinery Systems R&D Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	90,718	149,687	182,000	193,000	182,000	165,000

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

In managing its programs, the Office of the Biomass Program makes extensive use of peer review and federal advisory committees to develop the general Vision for achieving the President's Goal for oil dependency reduction and general directions for research investments. In addition, the Office of the Biomass Program uses industry experts to review the technical progress of project and uses the industry developed Stage-Gate process to validate stage of technology development and if continued funding is appropriate.

As the President's Biofuels Initiative, beginning in FY 2007, EERE proposes a refined program investment portfolio to accelerate program contributions to the critical national objectives of improving national energy security, providing for a cleaner environment, and ensuring continued domestic energy and economic growth and development. Through its strategic portfolio investments, EERE will help the Nation meet these objectives sooner. As part of this effort, EERE is accelerating its Biomass and Biorefinery Systems R&D in order to diversify the Nation's energy supply options, reduce the need for imported oil, and improve the environment. As a result of the President's Biofuels Initiative, the Biomass Program will begin in FY 2007 to establish the baseline for other feedstocks beyond corn stover, investigate the conversion of a much broader number of possible feedstocks, develop regional feedstock partnerships to identify local opportunities for feedstock production and ethanol production, re-emphasize the thermo-chemical conversion technology as a second possible pathway to success, begin the development of new fermentation organisms to improve ethanol yield, and accelerate research to achieve the ethanol target of $1.07 gal production cost by 2012.

To help reduce our dependence on oil, the President's Biofuels Initiative will accelerate research, development and demonstration aimed at bringing approximately 60 billion gallons of domestically produced biofuels to the market by 2030. Through public/private partnerships aimed at technology validation and demonstration, DOE will significantly reduce technological and financial risks and overcome institutional barriers associated with next-generation technologies.

The program's strategy focuses on: (a) enabling biorefineries that can use a variety of feedstocks to produce transportation fuels and high-value co-products appropriate for regional markets; and, (b) expanding the Nation's biomass supply potential such that the biorefineries will have access to a maximum quantity of potential feedstocks at reasonable prices, in as many regions as possible. Bio-based products, including higher quality animal feed products, chemicals and/or materials, can help improve biorefinery economics and increase flexibility.

In FY 2005, the program began to implement a biorefinery pathway strategy based on different biomass feedstocks. This strategy aims at industrial-scale validations by FY 2009 for a near-term pathway, and additional validations in FY 2011 and beyond for mid-term and longer-term pathways. Near-term pathways will be based on grains and oilseed whereas mid-term and long-term pathways will be based on residues from pulp and paper mills, other forest biomass, and future bioenergy crops.

The biorefinery pathways are based on the integration of the technologies developed in the Biochemical and Thermochemical Platform R&D, coupled with Products Development, which converts the platform outputs to fuels, chemical, materials, and energy. The USDA/DOE *Billion Ton Study*[1] provides the foundation for an expanded effort with USDA and land-grant universities for biomass feedstock development partnerships. These feedstock development partnerships include development activities supporting a future infrastructure for the pathways.

PRIORITIES:

Producing ethanol not just from corn, but from wood chips and stalks, or switch grass

What the Initiative provides starting in FY 2007:

- Baseline for other feedstock beyond corn harvest residue (stover)
- Investigate the conversion of a much broader number of possible feedstocks in support of 60 billion gallons by 2030
- Develop regional feedstock partnerships to identify local opportunities for feedstock production and ethanol production
- Reestablish the thermo-chemical conversion technology as a second possible pathway supporting 60 billion gallons by 2030

Research in cutting-edge methods of producing ethanol

What the Initiative provides starting in FY 2007:

- Fermentation organism development
- Accelerated research on all major hurdles to $1.07 gal production cost
- Leverage the results in converting corn stover to the broad variety of feedstocks

Reallocations to Support EERE Priorities:

EERE has made reductions and close-outs within its portfolio to support greater investments in advanced R&D to address critical national priorities such as dependence on oil, accelerating the development of clean electricity supply options, and developing highly efficient new technologies for buildings.

1 DOE and USDA, Biomass as Feedstock for a Bioenergy and Bioproducts Industry: The Technical Feasibility of a Billion-Ton Annual Supply (Billion Ton Study), February 2005.

The Initiative results in acceleration and an augmentation of the research funded by the Biomass Program in earlier years. The acceleration to our cost goals for stover conversion, the expansion of the number and types of feedstocks that will be targeted for conversion, and the augmentation of the types of conversion technologies used for ethanol production as well as their validation and demonstration at industrial-scale when appropriate is all part of this initiative.

BIOMASS AND BIOREFINERY SYSTEMS R&D

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.08.00.00 (Biomass and Biorefinery Systems R&D)				
Feedstock Infrastructure				
Complete a core R&D engineering design and techno-economic assessment of an integrated wet storage - biomass field pre-processing assembly system with a pretreatment process that could potentially be scaled up to produce feedstocks to achieve a reduction to $35 per ton by 2012 from $53 per ton as of 2003.	Establish three regional feedstock development centers in conjunction with USDA and land grant universities with the goal of producing feedstocks at $35per ton by 2012.	Establish an additional two regional feedstock development centers in conjunction with USDA and land grant universities with the goal of producing feedstocks at $35 per ton by 2012.	Complete a core R&D engineering design on a multi-crop feedstock depot system than can receive multiple biomass resources and preprocess those resources into a commodity cellulosic feedstock for less than $35 per dry ton delivered to biorefineries.	Complete and validate a multi-crop feedstock depot system for less than $35 per dry ton delivered to biorefineries.
Platforms Research and Development				

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Complete integrated tests of pretreatment and enzymatic hydrolysis in conjunction with existing fermentation organisms at bench-scale on com stover that validate $0.125 per pound sugars on the pathway to achieving $0.064 per pound in 2012. Demonstrate conversion of 50% of non-methane (C2+ higher) hydrocarbons that result in a syngas cost of $7.15/MBtu in 2007 (equivalent electricity cost of 6.83 cents/KWh).	From a detailed understanding of the structure and function of plant cell walls formulate improved enzyme mixtures and pretreatments that could have the potential of achieving $0.11 per pound of sugars on the pathway to $0.064 per pound. Make available information and recommendations to stakeholders. Demonstrate at pilot-scale technology capable of economically converting biomass residues (lignin), pulping liquors or waste fats and greases to synthesis gas or bio-oils that are suitable for fuels and chemicals production. The target is $6.88/MBtu in 2008 (equivalent electricity cost of 6.73 cents/KWh).	Demonstrate alternative pretreatment technologies at bench-scale using advanced cellulase enzymes and integrated technologies that have the potential of achieving $0.095per pound of sugars on the pathway to $0. 064 per pound by 2012. Validate technology capable of economically converting biomass residues, pulping liquors or waste fats and greases to synthesis gas or bio-oils that are suitable for fuels and chemicals production. The target is $5.81/MBtu in 2009 (equivalent electricity cost of 6.37 cents/KWh).	Achieve 80% xylan to xylose conversion with chemical and/or enzymatic hydrolysis that will further reduce the cost of sugars to $0.080 per pound and begin pilot testing to validate $0.064 per pound in 2012. Validate and demonstrate technology for the cost-effective clean-up of biomass synthesis gas leading to syngas costs of $5.40/MBtu in 2010 (equivalent electricity cost of 6.23 cents/KWh).	Complete integrated runs of pretreatment and enzymatic hydrolysis at pilot-scale to validate that an integrated biorefinery potentially could produce mixed, dilute biomass sugars at $0.064 per pound by 2012. Demonstrate the conversion of synthesis gas or bio-oils, derived from biomass residues, pulping liquors or waste fats and greases, to chemicals or transportation fuels. The target is $5.25/MBtu in 2011 (equivalent electricity cost of 6.18 cents/KWh).
		Utilization of Platform Outputs R&D		
Complete a preliminary engineering design package, market analysis, and financial projections for at least one commercial-scale projects for near term agricultural pathways (corn wet mill, corn dry mill, oilseed) to produce a minimum of 15 million gallons of biofuels per year (as mandated by EPAct 05).	In FY 2008 initiate construction of at least one commercial-scale project (initiated in FY 2007 as mandated by EPAct 05) for a near term lignocellulosic pathway (corn wet mill, corn dry mill, oilseed) to produce a minimum of 15 million gallons of biofuels per year.	In FY 2009, complete the start-up and preliminary operation of the commercial-scale biorefinery project awarded in FY 2007 as required by EPAct 05. In FY 2009, complete engineering design package, market analysis and financial projections for at least one industrial-scale project for a longer term pathway (pulp and paper , forest products, etc) capable of producing 1- 5 million gallons of biofuels per year in support of $1.07 per gallon ethanol by 2012.	In FY 2010, complete operation and data collection of the commercial-scale biorefinery project and validate the production cost of ethanol from near term lignocellulosic pathways (corn wet mill, corn dry mill, oilseed) as mandated by EPAct 05. Complete construction of at least one industrial-scale project for a longer term pathway (pulp and paper mill, forest product, etc.) to produce 1- 5 million gallons of biofuels per year in support of $1.07 per gallon ethanol by 2012.	In FY 2011 complete validation of at least one industrial-scale project for longer term agricultural pathways (pulp and paper, forest products, etc.), intended is to show that the facility can produce 1-5 million gallons of biofuels in support of $1.07 per gallon of ethanol by 2012.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

SOLAR ENERGY

Mission and Goals

The mission of the Solar Energy Program ("Solar Program") is to accelerate widespread commercialization of solar energy technologies across America by 2015, diversifying the Nation's electricity supply options, while increasing national security and improving the environment. In managing its programs, the Solar Program makes extensive use of peer reviews to develop general directions for research investments, to identify priorities, and to determine the best technologies to pursue.

The key Solar Program contributions to the Department's General Goal 4, Energy Security, is increased production of electricity and diversification of energy supply. The Solar Program works to improve the performance of next-generation solar energy technologies which reduce system, manufacturing, and installation costs to levels competitive with conventional energy sources. When Federal solar energy research increased in the 1970s in response to oil price shocks, the cost of electricity from solar resources was about $2.00 per kilowatt-hour (kWh). Technological advances over the last two decades have reduced solar electricity costs by more than 90 percent. Today, in areas with favorable conditions, solar electricity can be produced at costs as low as $0.12/kWh for CSP and as low as $0.18/kWh for PV applications.

The Solar Program goal of achieving cost-competitive solar electricity translates to a range of costs based on specific markets. For PV, the estimated cost ranges for market-specific cost-competitive electricity are:

- $0.05/kWh - $0.07/kWh for utility power markets,
- $0.06/kWh - $0.08/kWh for commercial markets, and
- $0.08/kWh - $0.10/kWh for residential markets.

The long-term cost goal for centralized CSP systems is currently $0.04/kWh - $0.06/kWh.

Key technology pathways to the goal include (detailed annual performance progress indicators are presented in their respective benefits sections):

- By 2010, reduce the 30-year user cost for PV electric energy to $0.11 - $0.18/kWh from $0.18 - $0.23/kWh in 2005.
- By 2010, reduce the cost of large-scale CSP power plants in the Southwest to $0.10 - $0.12/kWh from $0.12 - $0.14/kWh in 2005.

Solar Energy Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	83,113	148,372	143,000	143,000	143,000	133,000

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

Beginning in FY 2007, EERE proposes a refined program investment portfolio to accelerate program contributions to the critical national objectives of improving the national energy security, providing for a cleaner environment, and ensuring continued domestic energy and economic growth and development. Through its strategic portfolio investments, EERE will help the Nation meet these objectives sooner. As part of this effort, EERE is accelerating its Solar Energy R&D in order to diversify the Nation's electric supply options, reduce the need for new natural gas-fired power plants, and improve the environment. This new effort, focused on photovoltaic (PV) technologies, is called the Solar America Initiative (SAI). As a result, the Solar Program is undergoing a major realignment of research tasks starting in FY 2007 to accelerate PV technology and manufacturing R&D that will result in significant cost reductions and substantially greater system deployment.

SAI focuses on PV technology pathways that have the greatest potential to reach cost competitiveness by 2015. New industry-led partnerships, known as "Technology Pathway Partnerships," will be funded to aggressively address the issues of cost, performance, and reliability associated with each pathway. Under SAI, the Solar Program anticipates substantial work on PV modules, the heart of PV systems, as well as other "balance-of-system" (BOS) components and engineering practices. In addition to PV industry members, potential partners within the Technology Pathway Partnerships include universities, National Laboratories, states, and/or other governmental entities. Aggressive milestones and metrics will be used in a stage-gate process to monitor and accelerate progress, including periodic downselects to focus only on pathways with the best outlook for success. The Solar Program will work with the Office of Science, the Buildings Technologies Program and the Federal Energy Management Program (EERE) on SAI activities.

Reallocations to Support EERE Priorities:

EERE has made reductions and close-outs within its portfolio to support greater investments in advanced R&D to address critical national priorities such as dependence on oil, accelerating the development of clean electricity supply options, and developing highly efficient new technologies for buildings.

The Solar Program's activities presented in the FY 2007 budget request are part of the President's Solar America Initiative, which supports the President's Advanced Energy Initiative. These activities are focused on advances in how we power our homes and businesses. Funding for the Solar Program will primarily be used to achieve the goal of enabling photovoltaics to achieve cost competitiveness by 2015. Therefore, funding for the FY 2008 – FY 2011 budgets will not be reallocated to other priorities until this goal is achieved.

SOLAR ENERGY

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
		Program Goal 04.03.00.00 (Solar Energy)		
		Photovoltaic Energy Systems		
Verify, using standard laboratory measurements, a conversion efficiency of 14.5 percent of U.S.-made, commercial crystalline silicon PV modules. Production cost of such modules is expected to be $1.80 per Watt.	Verify, using standard laboratory measurements, a conversion efficiency of 15.5 percent of U.S.-made, commercial crystalline silicon PV modules. Production cost of such modules is expected to be $1.70 per Watt.	Verify, using standard laboratory measurements, a conversion efficiency of 16.0 percent of U.S.-made, commercial crystalline silicon PV modules. Production cost of such modules is expected to be $1.60 per Watt.	Verify, using standard laboratory measurements, a conversion efficiency of 16.5percent of U.S.-made, commercial crystalline silicon PV modules. Production cost of such modules is expected to be $1.50 per Watt.	Verify, using standard laboratory measurements, a conversion efficiency of 17.0 percent of U.S.-made, commercial crystalline silicon PV modules. Production cost of such modules is expected to be $1.40 per Watt.
Develop thin-film PV modules with an 11.8 percent conversion efficiency that are capable of commercial production in the U.S.	Develop thin-film PV modules with a 12.3-percent conversion efficiency that are capable of commercial production in the U.S.	Develop thin-film PV modules with a 12.7-percent conversion efficiency that are capable of commercial production in the U.S.	Develop thin-film PV modules with an 13.0-percent conversion efficiency that are capable of commercial production in the U.S.	Develop thin-film PV modules with a 13.3-percent conversion efficiency that are capable of commercial production in the U.S.
		Concentrating Solar Power		
Develop CSP trough collector and receiver technologies that enable a system conversion efficiency of 13.1%. The levelized cost of energy from such a system is expected to be in the range of $0.11-$0.13/kWh.	Develop CSP trough collector and receiver technologies that enable a system conversion efficiency of 13.4%. The levelized cost of energy from such a system is expected to be in the range of $0.11-$0.13/kWh.	Develop CSP trough collector and receiver technologies that enable a system conversion efficiency of 13.7%. The levelized cost of energy from such a system is expected to be in the range of $0.10-$0.12/kWh.	Develop CSP trough collector and receiver technologies that enable a system conversion efficiency of 14.0%. The levelized cost of energy from such a system is expected to be in the range of $0.10-$0.12/kWh.	Develop CSP trough collector and receiver technologies that enable a system conversion efficiency of 14.2%. The levelized cost of energy from such a system is expected to be in the range of $0.09-$0.11/kWh.
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

WIND ENERGY

Mission and Goals

The mission of the Wind Energy Program is to lead the Nation's research and development efforts to improve wind energy technology through public/private partnerships that enhance domestic economic benefit from development, and to address barriers to the use of wind energy in coordination with stakeholders, resulting in greater energy security through more diverse, clean, reliable, affordable and secure domestic supply.

The Wind Energy Program's key contribution to General Goal 4, Energy Security, is through supply growth and diversification. The Wind Energy Program focuses on developing new, cost-effective technologies through research and development with competitively selected public/private partnerships and by facilitating the installation of wind systems by providing supporting research in power systems integration, technology acceptance and other analytical and engineering support. Key technology pathways that contribute to achievement of these benefits include (annual performance indicators are provided in the individual technology benefits narrative):

- Low Wind Speed Technology (LWST):
  - By 2012, reduce the cost of electricity from large wind systems in Class 4 winds to 3.6 cents/kWh for onshore systems (from a baseline of 5.5 cents/kWh in 2002);
  - By 2014, reduce the cost of electricity from large wind systems in Class 6 winds to 5 cents/kWh for shallow water (depths up to 30 meters) offshore systems (from a baseline of 9.5 cents in FY 2005); and
  - By 2016, reduce the cost of electricity from large wind systems in Class 6 Winds to 5 cents/kWh for transitional (depths up to 60 meters) offshore systems (from a baseline of 12 cents in FY 2006).
- Distributed Wind Technology (DWT)[1]: By 2007, reduce the cost of electricity from distributed wind systems to 10-15 cents/kWh in Class 3 wind resources, from a baseline of 17-22 cents/kWh in 2002. [Note: a range of cost performance targets are most appropriate for distributed wind systems, which require an approach based on relative improvement within scale, application, and market segments. The 10 cent/kWh target corresponds to a 50-100 kW turbine that is typical for large farms, small to mid-size commercial and/or remote village applications. The 15 cent/kWh target corresponds to a 3-10 kW turbine for residential applications.]
- Technology Acceptance: By 2010, facilitate the installation of at least 100 MW of wind in at least 30 States from a baseline of 8 States in 2002.

1 Goals using Cost of Energy are tracked to a fixed technology baseline that reflects a set of standard financial and technology assumptions for each technology (Onshore, Offshore and Distributed Wind Technologies). Cost of energy targets differ from actual market conditions, as baseline technology assumptions do not include such factors as the on and off nature of the Production Tax Credit that leads to turbine demand spikes; varying financial variables; fluctuating commodity prices and currency exchange rates; and changes in expected equipment life.

Wind Energy Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	38,857	43,819	43,819	43,819	43,819	43,819

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

The Wind Program combines industry input, technical assessment, and peer review to support its planning process. The program's technical assessment process monitors the status of wind technology in achieving program cost goals, reducing acceptance barriers, identifying marketplace needs, and clarifying the technological pathways that will lead to successful marketplace competition. The program also uses a formal peer review process to benefit from the guidance of industry and the research community and to provide an outside view of the program. Both the technical assessment and peer review processes provide inputs that the program management team considers in making decisions about strategic program directions and funding priorities.

PRIORITIES:

Technology Viability

- A third phase Low Wind Speed Technology solicitation will be issued in fiscal year 2007 to engage industry partners in addressing the issues associated with developing low wind speed technologies for land-based applications and provide the last phase of partnerships to meet the program's 2012 cost of energy goal. The focus of the solicitation will address the improvement of existing turbine systems and component technologies to enhance likelihood of success in reaching the goal with reliable, verified technology. Supporting research and testing as well as partnership design review and analysis will be undertaken over the length of the contract terms, generally three to four years.
- The five year plan for shallow and transitional offshore wind technologies includes the development of a research baseline which will be used to direct further technology development partnerships and research requirements. The initial baseline technology assessment falls into two areas, concept studies and design basis development, both of which are being initiated in fiscal year 2006 and will continue in a staged process over the next few years. The first of the concept studies will investigate technology improvement opportunities for transitional depths through partnerships with experienced offshore and wind energy companies. Design basis development will obtain and analyze data from existing and planned offshore wind systems in an effort to better understand the offshore environment and its impact on designing wind technologies. In fiscal year 2008, the program will initiate the second stage of shallow water offshore private public partnerships, informed by the results of the baseline technology assessments. The initial phase of industry partnerships for transitional depth technologies are expected to be initiated by 2010.

- The small wind turbine R&D industry partnerships under Distributed Wind Technology will be completed in 2007. The program will assist industry in transitioning results of this effort to commercial applications, and evaluate needs and opportunities for future R&D support for the distributed wind technology segment of the industry.

Technology Application

- The five year plan for Systems Integration is to continue to assist regional electric system planning and operations personnel to make informed decisions about the integration of wind energy into their systems. Through coordinated outreach and supported engineering and analysis, the program has identified three areas which will receive continued focus; (1) technology characterization and data collection; (2) tools and methods development; and (3) application and implementation. There will be an orderly and progressive approach to resolving these issues in seven to ten regions. In each region there will be several decisions required to reach the goal set by the program. As wind penetration increases, some regions will need to be convinced to expand transmission and delivery system access. Program personnel will work with organizations such as independent system operators, regional transmission organizations, the Federal Energy Regulatory Commission, and state and local utility planners to ensure wind is considered in their deliberations and rulemaking proceedings in a fair and equitable manner. As future markets and applications are considered, the program will integrate these organizations' needs into the activities conducted in target regions identified through an annually-assessed market maturity index.
- Technology Acceptance will continue to work towards completing its current goal of supporting 100 megawatts of installed capacity for land-based wind generation in 30 states. At that stage of development, state and local stakeholders will have become knowledgeable about wind resources, benefits and challenges to wind development. The program will continue to build on efforts, and, as appropriate, shift emphasis for outreach and technical assistance to utility owners and regulators, state and local agencies and officials, Tribal and agricultural sectors, and others. As is the case with wind grid integration, future markets and applications will be considered and the program will integrate these organizations' needs into the activities conducted in target regions identified through an annually-assessed market maturity index. Key program changes anticipated over the next five-year period include:
- Shift to cost-shared regionally-based program;
- Enhanced focus on resource assessment and completing mapping;
- Refocused support for utility based outreach and technical assistance;
- Shift from land-based to offshore wind support.

Reallocations to Support EERE Priorities:

EERE has made reductions and close-outs within its portfolio to support greater investments in advanced R&D to address critical national priorities such as dependence on oil, accelerating the development of clean electricity supply options, and developing highly efficient new technologies for buildings.

WIND ENERGY

Performance Targets (Funding Scenario I –Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.05.00.00 (Wind Energy)				
Technology Viability/Low Wind Speed Technology				
Low Wind Speed Technology (LWST) Annual COE target: 4.1 cents per kWh in onshore Class 4 winds; 8.8 cents per kWh for shallow water offshore systems in Class 6 winds; and 11.8 cents per kWh for transitional offshore systems in Class 6 winds.	LWST COE Annual Target: 4.0 cents per kWh in onshore Class 4; 8.2 cents per kWh for shallow offshore systems; 11.5 cents per kWh for transitional offshore systems	LWST COE Annual Target: 3.9 cents per kWh in onshore Class 4; 7.5 cents per kWh for shallow offshore systems; 10.8 cents per kWh for transitional offshore systems	LWST COE Annual Target: 3.8 cents per kWh in onshore Class 4; 6.9 cents per kWh for shallow offshore systems; 9.5 cents per kWh for transitional offshore systems	LWST COE Annual Target: 3.7 cents per kWh in onshore Class 4; 6.3 cents per kWh for shallow offshore systems; 8.3 cents per kWh for transitional offshore systems
Technology Viability/Distributed Wind Technology				
Distributed Wind Technology COE Target: 10-15 cents per kWh in Class 3 winds.				
Technology Application/Technology Acceptance				
Technology Acceptance: 22 States with over 100 MW wind installed.	25 States with over 100 MW wind installed.	27 States with over 100 MW wind installed.	30 States with over 100 MW wind installed.	
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

GEOTHERMAL TECHNOLOGY

Mission and Goal

The mission of the Geothermal Technology Program ("Geothermal Program") was to work in partnership with U.S. industry to establish geothermal energy as an economically competitive contributor to the U.S. energy supply. The Department plans to closeout the Geothermal Program in FY 2007 and transfer results of its research and development work related to geothermal technology to industry and the public sector.

With the completion of final reporting on funded projects, the Geothermal Program's goal is to closeout this program and to effectively transition remaining program activities and information (e.g., R&D results, technical data and findings) to private/public sector programs.

Geothermal Technology Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	23,066	0	0	0	0	0

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

The program has achieved its key technical objectives. Geothermal is now a mature energy technology. New geothermal projects in the US are planned for California, Nevada, Idaho, Alaska, Hawaii, Utah, and Arizona. There are 483 megawatts of new power purchase agreements signed in California, Nevada, Idaho and Arizona. Projects under construction, or which have both Power Purchase Agreements and are undergoing production drilling, amount to 547 megawatts in the seven Western States. The Western Governors Association geothermal task force recently identified over 100 sites with an estimated 13,000 MWe of power with near-term development potential. The highest priority of the geothermal industry has been the attainment of the production tax credit, which it accomplished with the passage of the Energy Policy Act of 2005. In addition, the Energy Policy Act streamlined geothermal leasing. Together they will spur geothermal development without the Department's Geothermal Program.

The Geothermal Program has substantial unspent balances (i.e., uncosted carryover) from previous years, including funds from two large projects that were terminated. Since the Program does not have extensive field and laboratory facilities that would require major decommissioning efforts, these available funds are adequate to complete all closeout activities.

GEOTHERMAL TECHNOLOGY

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
		Program Goal 04.07.00.00 (Geothermal Technology)		
		Technology Development/Systems Development		
Report on completion of program activities and previous year funded projects. Complete closeout of Geothermal Technology Program.	N/A	N/A	N/A	N/A
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	N/A	N/A	N/A	N/A

HYDROPOWER

Mission and Goal

The mission of the Hydropower Program has been to lead the Nation's efforts to improve the technical, societal, and environmental benefits of hydropower, and develop cost-competitive technologies that enable the development of new and incremental hydropower capacity, adding to the diversity of the Nation's energy supply. The Department plans to closeout the Hydropower Program in FY 2006 and transfer results of its research and development related to testing of fish-friendly large turbines to industry. No funding is requested in FY 2007.

With the completion of testing on new turbine technologies and consistent with previous congressional direction, the Hydropower Program's goal is to closeout this program and effectively transition remaining program activities and information (e.g., R&D results, technical data and findings) to private/public sector programs.

Hydropower Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	495	0	0	0	0	0

Funding Scenario I – Target

Efforts in Hydropower in FY 2006 will focus on closing out contracts at sites where technology has been implemented. No program activity will take place in FY 2007.

HYDROPOWER

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.06.00.00 (Hydropower)				
Technology Validation, Technology Application				
N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A

VEHICLE TECHNOLOGIES

Mission and Goals

The mission of the Vehicle Technologies Program is to develop more energy-efficient and environmentally friendly highway transportation technologies (for both cars and trucks) that will enable America to use significantly less petroleum. The long-term aim is to develop "leapfrog" technologies that, through significant improvements in vehicle energy efficiency, will provide Americans with continuing freedom of mobility and greater energy security, at lower costs and with lower impacts on the environment than current vehicles. The program focuses its research and development investments specifically on potential technology improvements that have uncertain or long-term outcomes, yet have the potential for significant public benefit. The high risks associated with these projects make it unlikely that they would be pursued by industry alone.

The key program contribution to General Goal 4, Energy Security, is the direct reduction of petroleum use. The VT Program supports an R&D portfolio focused on developing technologies that can enable dramatic improvements in the energy efficiency of passenger vehicles (e.g., cars, light trucks, and SUV's) and commercial vehicles (heavy trucks, buses, etc.). In addition, the program R&D will focus on reducing the cost and overcoming technical barriers to volume manufacturing of advanced vehicle technologies.

The program's performance measures presented below demonstrate key technology pathways that contribute to achievement of this goal. Some performance measures have been expanded to provide more comprehensive coverage of the program activities as is recommended in the President's Management Agenda.

- Hybrid and Electric Propulsion subprogram: By 2010, develop an integrated electric propulsion system that costs no more than $12/kW peak ($660 per system compared to the cost of $1,900 in 1998) and can deliver at least 55 kW of power for 18 seconds and 30 kW of continuous power. Additionally, the propulsion system will have an operational lifetime of 15 years.
- Hybrid and Electric Propulsion subprogram: Hybrid and Electric Propulsion R&D activities will reduce the production cost of a high power 25 kW battery for use in passenger vehicles from $3,000 in 1998 to $500 by 2010 (with an intermediate goal of $750 in 2006), enabling cost competitive market entry of hybrid vehicles.
- Advanced Combustion Engine R&D subprogram and Fuel Technology subprogram: Improve the efficiency of internal combustion engines from 30 percent (2002 baseline) to 45 percent by 2010 for passenger vehicles and from 40 percent (2002 baseline) to 55 percent by 2013 for commercial vehicle applications while utilizing an advanced fuel formulation that incorporates a non-petroleum based blending agent to reduce petroleum dependence and enhance combustion efficiency.
- By 2010, develop material and manufacturing technologies which, if implemented in high volume, could cost-effectively reduce the weight of passenger vehicle body and chassis systems by 50 percent with safety, performance, and recyclability comparable to 2002 vehicles.

Vehicle Technologies Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	182,104	166,024	166,024	166,024	166,024	166,024

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

The Vehicle Technologies Program addresses our most pressing national energy need – reducing oil dependence. The program focuses its technology research and development investments specifically on areas that would not be pursued by industry alone due to high risks and uncertain or long-term outcomes. Program activities include research, development, demonstration, testing, technology validation, technology transfer, and education. These activities are aimed at developing technologies that could achieve: 1) significant improvements in vehicle fuel efficiency and 2) displacement of oil by other fuels which ultimately can be produced domestically in a clean and cost competitive manner.

Most of the Program's work supports and is planned with two government-industry partnerships: the FreedomCAR and Fuel Partnership and the 21st Century Truck Partnership. In addition, Clean Cities partnerships with state and local governments serve as deployment mechanisms to promote the use of alternative fuels and petroleum-displacement technologies.

For passenger vehicles, the long-term strategy is to perfect the technologies that will enable a timely transition to a transportation hydrogen economy. The interim strategy is to develop and deploy technologies that can rapidly be integrated into current and future vehicles with little or no infrastructure changes. These include lightweight materials, advanced combustion engines, improved hybrid batteries, and cleaner fuels. The program is also extending the battery and hybrid systems R&D to provide an emphasis on the development and introduction of "plug-in" hybrids that could allow most local driving to be powered entirely by batteries that are charged at night, while allowing normal fuel operation for longer trips.

The Vehicle Technologies Program and our commercial vehicle industry partners have developed a common vision: "that our Nation's trucks and buses will safely and cost-effectively move larger volumes of freight and greater numbers of passengers while emitting little or no pollution and dramatically reducing the dependence on oil." Ultimately, the 21st Century Truck Partnership seeks safe, secure, and environmentally friendly trucks.

PRIORITIES:

Passenger Vehicles

The key areas of emphasis for passenger (light-duty) vehicles and the FreedomCAR and Fuel Partnership will be electric propulsion systems, advanced internal combustion engines based on novel

combustion regimes, advanced batteries for electric energy storage, lightweight materials – particularly composites –, and advanced fuels – both advanced petroleum-based fuels and non-petroleum-based fuels and lubricants.

Commercial Vehicles

The program's research emphasis is on improved, more efficient combustion engines that can also meet stringent 2011 EPA emissions targets, and technologies to reduce "parasitic losses" in the engine, drive-train, and ancillary vehicle systems.

Reallocations to Support EERE Priorities:

EERE has made reductions and close-outs within its portfolio to support greater investments in advanced R&D to address critical national priorities such as dependence on oil, accelerating the development of clean electricity supply options, and developing highly efficient new technologies for buildings.

- A particular emphasis begun in FY 2007 and continuing in the outyears is on developing advanced batteries and other system technologies to support plug-in hybrid-electric vehicles (PHEVs), which offer owners the option of recharging the batteries overnight and then doing daily commuting or errands with a minimal use of petroleum.
- We anticipate shifts in funding between and within subprograms not depicted in the above table. The shifts will be based on benchmarking and on the achievement of 2010 goals established to assess progress of the FreedomCAR activity. The attainment of these progress goals may not signal the completion of these activities as there could be opportunities for significant gains beyond those represented by the current goal set.
- Shifts also will occur from providing greater emphasis to R&D currently in the very early stages of development such as the opportunities represented by waste heat recovery from efficient, low cost thermoelectric devices, and to specialized applications of hybrid technologies currently being developed. We are currently examining possible shifts in emphasis over the next five-year planning horizon as part of our multi-year planning process.

VEHICLE TECHNOLOGIES

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.02.00.00 (Vehicle Technologies)				
Hybrid and Electric Propulsion/Advanced Power Electronics				
Demonstrate in the laboratory a motor with a specific power of 1.0 kW/kg, power density of 3.0 kW/liter, projected cost of $9/kW peak, and efficiency of 90%.	Demonstrate in the laboratory a combined inverter/motor with a specific power of 1.2 kW/kg, power density of 3.2 kW/liter, cost of $14/kW peak, and efficiency of 90% for a speed range between 35% and 100% speed.	Demonstrate in the laboratory a combined inverter/motor with a specific power of 1.2 kW/kg, power density of 3.5 kW/liter, cost of $14/kW peak, and efficiency of 90% for a speed range between 35% and 100% speed.	Validate a combined inverter/motor that demonstrates a specific power of 1.2 kW/kg, a power density of 3.5 kW/liter, a cost of $12/kW peak, and an efficiency of 90%.	Demonstrate in the laboratory a combined inverter/motor with a specific power of 1.5 kW/kg, power density of 4 kW/liter, and an estimated production cost of $10/kW peak.
Hybrid and Electric Propulsion/Energy Storage				
Reduce high power, 25 kW, passenger vehicle, lithium ion battery cost to $700 per battery system.	Reduce high power, 25 kW, passenger vehicle, lithium ion battery cost to $625 per battery system.	Reduce high power, 25 kW, passenger vehicle, lithium ion battery cost to $550 per battery system.	Develop electric drive train energy storage with a 15-year life at 300 Wh with a discharge power of 25 kW for 18 seconds and $500 battery system cost.	Reduce the production cost of a high-energy battery system (light vehicle) to $300/kWh for "plug-in" hybrid vehicle applications.
Advanced Combustion Engine R&D/Combustion and Emission Control and Heavy Truck Engine; Fuels Technology				
In the laboratory, demonstrate passenger vehicle combustion engines with a 42 percent brake thermal efficiency.	In the laboratory, demonstrate passenger vehicle combustion engines with a 43 percent brake thermal efficiency.	In the laboratory, demonstrate passenger vehicle combustion engines with a 44 percent brake thermal efficiency and commercial vehicle combustion engines with 51 percent efficiency while meeting EPA 2010 emission standards (0.2 g/hp-hr NO_x).	In the laboratory, demonstrate passenger vehicle combustion engines with a 45 percent brake thermal efficiency and commercial vehicle combustion engines with a 52 percent efficiency while meeting EPA 2010 emission standards (0.2 g/hp-hr NO_x).	In the laboratory, demonstrate passenger vehicle combustion engines with a 45 percent brake thermal efficiency and commercial vehicle combustion engines with a 53 percent efficiency while meeting EPA 2010 emission standards (0.2 g/hp-hr NO_x).
Materials Technology/Lightweight Materials Technology				
Develop technologies which, if implemented in high volume, could reduce the weight of body and chassis components by 10%.	Develop technologies that if implemented in high volume could reduce the weight of body and chassis components by 25%.	Develop technologies that if implemented in high volume could reduce the weight of body and chassis components by 40%.	Develop technologies that if implemented in high volume could reduce the weight of body and chassis components by 50%.	Demonstrate the technologies that are needed to reduce vehicle body and chassis weight by 50%.
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

BUILDING TECHNOLOGIES

Mission and Goals

The mission of the Building Technologies Program (BT) is to develop technologies, techniques and tools for making residential and commercial buildings more energy efficient, productive, and affordable. The portfolio of activities includes efforts to improve the energy efficiency of building components and equipment, and their effective integration using whole-building-system-design techniques, the development of building codes and equipment standards, and integration of renewable energy systems into building design and operation.

The principal Building Technologies Program contributions to General Goal 4, Energy Security, are improving energy efficiency and incorporating productive power technologies into the whole building infrastructure. Key technology pathways that contribute to achievement of the goal include:

- Residential Buildings Integration R&D Activities: Provide the energy technologies and solutions that will catalyze 70 percent reduction in energy use of new prototype residential buildings that when combined with onsite energy technologies result in zero energy homes (ZEH)[1] by 2020 and when adapted, result in a reduction in energy use of existing homes. By 2010, develop, document and disseminate five technology packages that achieve an average of 40 to 50 percent reduction in whole house energy use. Performance indicators include the number of: subsystem technological solutions developed, researched, and evaluated; technology package research reports developed, researched, and evaluated against the Building America benchmark[2] for homes; builder best practices manuals developed and number of existing homes retrofitted to achieve 20 percent or more improvement in energy efficiency; project and demonstration homes developed in the Building America (BA) Program.
- Commercial Buildings Integration R&D Activities: By 2010, develop, document and disseminate 3 to 5 technology packages that can achieve 30 to 50 percent reduction in the purchased energy use in new, small commercial buildings relative to ASHRAE 90.1-2004. Performance indicators include the number of: technology packages developed, researched, and evaluated on their demonstrated potential to contribute to the target reduction of energy use in new buildings.
- Emerging Technologies (ET) Activities: Accelerate the introduction of highly-efficient technologies and practices for both residential and commercial buildings. The emerging technologies activities support the BT goal through research and development of advanced lighting, building envelope, windows, space conditioning, water heating and appliance technologies. Without advanced components and subsystems developed in the Emerging Technologies activities, the goal of zero energy buildings will not be met. The performance indicators include the number of potentially market viable technologies demonstrated.

1 The zero energy building (ZEB) (referred to as zero energy homes (ZEH) in the residential sector) research initiative is bringing a new concept to homebuilders across the United States. A zero energy home combines state-of-the-art, energy efficient construction and appliances with commercially available renewable energy systems such as solar water heating and solar electricity. This combination can result in a net zero energy consumption. A ZEH, like most houses, is connected to the utility grid, but can be designed and constructed to produce as much energy as it consumes on an annual basis. With its reduced energy needs and renewable energy systems, a ZEH can, over the course of a year, give back as much energy to the utility as it takes.

2 Building America Benchmark, Version 3.1, November 2003, National Renewable Energy Laboratory

- Equipment Standards and Analysis: Increase minimum efficiency levels of buildings and equipment through codes, standards, and guidelines that are technologically feasible, economically justified, and save significant energy. By 2010, issue 13 formal proposals, consistent with enacted law, for enhanced product standards and test procedures. Performance indicators include: product standards and test procedures proposed/issued; and analyses completed for labeling and ENERGY STAR® update and expansion to include new products.
- Technology Validation and Market Introduction: Accelerates the adoption of clean, efficient, and domestic energy technologies through such activities as Rebuild America and ENERGY STAR®. By 2010, increase the market penetration of ENERGY STAR® labeled windows to 57 percent (41 percent, 2001 baseline), and maintain 30 percent market share for ENERGY STAR® appliances. ENERGY STAR® activities will work to remove technical, financial and institutional barriers to the widespread awareness, availability, and purchase of highly efficient appliances, compact fluorescent lighting products, and windows. Rebuild America activities will work to remove technical, financial and institutional barriers to the widespread awareness, availability and application of highly efficient commercial building design, construction, retrofit and operations practices.

Building Technologies Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	69,266	77,329	75,329	75,329	75,329	75,329
Above Target (FY 2007–2011)	69,266	77,329	77,329	77,329	77,329	77,329

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

The imbalance between energy supply and energy demand in this Nation is not limited to petroleum for transportation, but also extends to electricity and natural gas needed for our homes and offices. The building sector is responsible for 72% of the demand for electricity and 54% of natural gas. The development and introduction of energy efficient building technologies could help moderate the Nation's energy demand and help facilitate the introduction of cost-effective renewable technologies. Such improvements have the potential to reduce susceptibility to energy price fluctuations, moderate energy bills; reduce criteria and other pollutants; and provide greater energy security and reliability.

The Building Technologies Program has undertaken a multi-year planning effort that focuses on the development of technical pathways and the integration of the systems and component research to achieve Zero Energy Buildings. The multi-year plan makes extensive use of external market and technical assessments to assess opportunities for new technologies, evaluate the potential outcomes, and redirect or reprioritize when appropriate.

PRIORITIES:

The multi-year program plan includes base funding to continue strong efforts in all program areas. Additional resources have been added to the following high-priority areas:

- Solid State Lighting: Lighting is the most significant energy user in commercial buildings at about 4 quadrillion Btu per year. Development of Solid State Lighting technologies that can reduce commercial building lighting electricity consumption by at least 50 percent is a top priority. These technologies promise to revolutionize the energy efficiency, appearance, visual comfort, and quality of lighting.
- Appliance Efficiency Standards: Improving appliance efficiency reduces energy demand and saves consumers money. The Department is committed to clearing the backlog of rulemakings and meeting all of its new Energy Policy Act of 2005 (EPAct) requirements. The multi-year budget request supports the Department's planned schedules which are firm and achievable and will enable the Department to produce at least one new or amended standard for all products in the backlog no later than June 2011, while also meeting EPAct 2005 requirements.
- Residential Buildings R&D Integration: Residential buildings account for 55% of energy demand in the building sector. With over 2 million new homes constructed annually; improving the energy efficiency of new residential building is a top priority. Efficient residential buildings are also a key platform for introduction of cost-effective solar energy technologies.

Reallocations to Support EERE Priorities:

EERE has made reductions and close-outs within its portfolio to support greater investments in advanced R&D to address critical national priorities such as dependence on oil, accelerating the development of clean electricity supply options, and developing highly efficient new technologies for buildings.

- The Buildings Technologies Program supports EERE priorities to improve energy security by: facilitating the use of a diverse supply of reliable, affordable and environmentally sound energy; exploring advanced technologies that make a fundamental improvement in our mix of energy options; and improving energy efficiency.
- Research and development on technologies to support Zero Energy Buildings strongly supports the President's Advanced Energy Initiative by providing residential and commercial foundations for the integration of clean renewable energy systems.

Funding Scenario II - Above Target

The above target scenario is identical to the target scenario with an increase of $2 million in FY 2008-2011. The targets will be identical for both scenarios. In the above target scenario, Building Technologies Program will allocate additional resources in FY 2008-2011 to the Residential Buildings R&D Integration sub-program to reduce risk in achievement of the Zero Energy Buildings target in all climatic zones and support the President's Advanced Energy Initiative through accelerated integration of cost-effective solar energy technologies.

BUILDING TECHNOLOGIES

Performance Targets (Funding Scenario I – Target and Funding Scenario II – Above Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.04.00.00 (Building Technologies)				
Residential Buildings Integration				
Document in Technology Package Research Reports research results for production ready new residential buildings that are 30% more efficient in 1 climate zone and 40% more efficient in 1 climate zone than the whole-house Building America benchmark.	Complete research for production ready new residential buildings in 2 climate zones that are 40% more efficient than the whole-house Building America benchmark and document in two technology package research reports.	Complete research for production ready new residential buildings in 1 climate zone that is 40% more efficient than the whole-house Building America benchmark and document in a technology package research report.	Complete research for production ready new residential buildings in 1 climate zone that is 40% more efficient than the whole-house Building America benchmark and document in a technology package research report.	Complete research for production ready new residential buildings in 1 climate zone that is 50% more efficient than the whole-house Building America benchmark and document in a technology package research report.
Commercial Buildings Integration				
Complete the development of one new design technology package for a second small to medium sized commercial building type to achieve 30 percent energy savings over ASHRAE 90.1-2004.	Complete the development of final two new design technology packages for a small to medium sized commercial building type to achieve 30 percent energy savings over ASHRAE 90.1-2004. Complete updates to optimization analysis technique required to achieve 50% or greater energy savings compared to ASHRAE 90.1-2004.	Complete 1 design technology package for small to medium sized commercial buildings to achieve 50% energy reduction compared to ASHRAE 90.1-2004.	Complete 2 design technology packages including 1 additional package for small commercial buildings and 1 for medium-sized commercial buildings for 50% energy reduction compared to ASHRAE 90.1-2004.	Complete 3 design technology packages including 1 additional package for small commercial buildings and 2 for medium sized commercial buildings for 50% energy reduction compared to ASHRAE 90.1-2004.
Emerging Technologies				
Achieve at least 72 lumens per Watt (in a laboratory device) of white light from solid state devices based on cost-shared research which is competitively selected.	Solid State Lighting: Conduct selected competitively cost-shared research on technology to achieve ≥ 79 1m/W (in a laboratory device) of white light from solid state devices with industry, National Laboratories, and universities.	Conduct selected competitively cost-shared research on technology to achieve ≥ 87 1m/W (in a laboratory device) of white light from solid state devices with industry, National Laboratories, and universities.	Conduct selected competitively cost-shared research on technology to achieve ≥ 95 1m/W (in a laboratory device) of white light from solid state devices with industry, National Laboratories, and universities.	Conduct selected competitively cost-shared research on technology to achieve ≥ 103 1m/W (in a laboratory device) of white light from solid state devices with industry, National Laboratories, and universities.
Equipment Standards and Analysis				
Final rules will be issued for 3-5 product categories, consistent with enacted law, to amend appliance standards and test procedures that are economically justified and will result in significant energy savings. This	Complete analytical and regulatory steps necessary for rulemaking activities for 13-15 product categories. Final rules will be issued for 1-2 of these product categories, consistent with enacted law, to amend appliance	Complete analytical and regulatory steps necessary for rulemaking activities for 14-16 product categories. Final rules will be issued for 7-9 of these product categories, consistent with enacted law, to amend appliance	Complete analytical and regulatory steps necessary for rulemaking activities for 7-9 product categories. Final rules will be issued for 2-3 of these product categories, consistent with enacted law, to amend appliance	Complete analytical and regulatory steps necessary for rulemaking activities for 11-13 product categories. Final rules will be issued for 4-6 of these product categories, consistent with enacted law, to amend appliance

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
includes final rules for distribution transformers and residential furnaces and boilers.	standards and test procedures that are economically justified and will result in significant energy savings.	standards and test procedures that are economically justified and will result in significant energy savings.	standards and test procedures that are economically justified and will result in significant energy savings.	standards and test procedures that are economically justified and will result in significant energy savings.
Technology Validation and Market Introduction/ ENERGY STAR®				
Increase market penetration of appliances to 30 to 32% (baseline 30% calendar year 2003), to 2.5 to 4% for CFLs (baseline 2% calendar year 2003) and 45 to 50% for windows (baseline 40% for calendar year 2003). Estimated energy savings will be 0.032 quads and $671 million in consumer utility bill savings.	The market penetration target for appliances is 32 percent (baseline 30%, calendar year 2003), 2.5 percent for CFLs (baseline 2%, calendar year 2003), and 51 percent for windows (baseline 40%, calendar year 2003). Estimated energy savings will be 0.8 quads.	The market penetration target for appliances is 34 percent (baseline 30%, calendar year 2003), 3.0 percent for CFLs (baseline 2%, calendar year 2003), and 54 percent for (baseline 40%, calendar year 2003). Estimated energy savings will be 0.97 quads.	The market penetration target for appliances is 30 percent (baseline 30%, calendar year 2003), 3.25 percent for CFLs (baseline 2%, calendar year 2003), and 57 percent for windows (baseline 40%, calendar year 2003). Estimated energy savings will be 1.1 quads.	The market penetration target for appliances is 31 percent (baseline 30%, calendar year 2003), 3.5 percent for CFLs (baseline 2%, calendar year 2003), and 60 percent for windows (baseline 40%, calendar year 2003). Estimated energy savings will be 1.1 quads.
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

INDUSTRIAL TECHNOLOGIES

Mission and Goals

The mission of the Industrial Technologies Program (ITP) is to reduce the energy intensity of the U.S. industrial sector through a coordinated program of research and development, validation, and dissemination of energy-efficiency technologies and operating practices.

The Industrial Technologies Program goal is to partner with our most energy-intensive industries in strategic planning and specific RD&D to develop the technologies needed to use energy efficiently in their industrial processes and cost-effectively generate much of the energy they consume. The result of these activities will save feedstock and process energy, improve the environmental performance of industry, and help America's economic competitiveness.

The Industries of the Future Technology Program's key contribution to energy security is through improving energy efficiency and directly reducing the demand for oil, natural gas, and electricity.

The production improvements and direct reduction in both total industrial energy use and the use of fossil fuels could contribute to the Administration goal of an 18 percent reduction between 2002 and 2012 in the greenhouse gas intensity, or total greenhouse gas emissions per unit of Gross Domestic Product, of the U.S. economy.

According to an EIA report[1], the industrial end-use sector decreased its emissions of carbon dioxide from 2002 to 2003. Industrial production rose by 0.2 percent in 2003, while industrial emissions of carbon dioxide fell by 0.3 percent, for a total carbon intensity reduction of 0.5 percent. Overall, from 2002 to 2003, carbon dioxide emissions throughout the economy grew by 0.8 percent, or 45.5 million metric tons, attributable both to economic growth and a cold winter. In 2003, ITP estimates that technologies it developed and activities it undertook saved over 24 million metric tons of carbon dioxide, or 6.6 million metric tons of carbon equivalent.[2]

1 See EIA Report Emissions of Greenhouse Gasses in the United States 2003 at http://www.eia.doe.gov/oiaf/1605/cdrom/pdf/ggrpt/057303.pdf.

2 See 2005 Impacts Report at http://www.pnl.gov/impacts/

Industrial Technologies Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	56,855	45,563	0	0	0	0
Above Target (FY 2007-2011)	56,855	45,563	45,563	45,563	45,563	45,563

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

While industry remains a major energy end-use sector of the Nation's economy, significant gains in efficiency have already been achieved (output since the 1970's has more than doubled for essentially the same energy consumption). Since significant economic incentives now exist for industry to continue on its own to invest in new, more efficient technologies, the Industrial Technologies Program will close out all program activities by FY 2008, and transfer R&D results, findings, and technical data tools to the private and public sectors.

PRIORITIES:

- ITP will shift its priorities toward short-term outcomes for its most promising energy efficiency R&D programs.

Reallocations to Support EERE Priorities:

- Since the Industrial Technologies Program is being phased out with termination in FY 2007, the program is shifting its focus toward using the convening power of government to encourage future industrial cooperation.
- Less productive activities will be terminated first.
- Research and development results will be transferred to industry.
- In FY 2007, ITP will fully fund the deployment of Energy Savings teams to heavy industrial energy users, to support the recent Secretary of Energy's "Easy Ways to Save Energy" initiative.
- While Industry remains a major component of this Nation's energy infrastructure, EERE is reallocating its portfolio to focus on current priorities and technology shifts to more broadly applicable and highest priority petroleum fuel savings and clean domestic fuel, end use systems and generation such as the President's Hydrogen Initiative, Solar America Initiative, and Biofuels Initiative.

FUNDING SCENARIO II - ABOVE TARGET

Priorities and Assumptions:

Industry remains a major component of this Nation's energy infrastructure, even as some of the Department's current priorities and technology R&D shift to more broadly applicable and highest priority petroleum fuel savings and clean domestic fuel, end use systems and generation. In FY 2007-2011, the Industrial Technologies Program will use the convening power of government to form working groups for future industrial cooperation in the areas of Transforming Manufacturing Technologies and Industrial Fuels and Feedstock Flexibility. Work in these areas will begin in 2007, creating industry-government partnerships for evaluation of past efforts and preliminary research. The focus on these areas will continue in 2008-2011, creating more targeted research agendas to reduce natural gas and petroleum consumption.

Between 2002 and 2011, industrial technologies will contribute to a 10.6 percent reduction in energy intensity (Btu per unit of industrial output as compared to 2002) in the energy-intensive Industries of the Future (a potential savings of 0.8 quads above projected baseline efficiency improvements); between 2004 and 2011, target industries and RD&D partners will commercialize over 25 energy efficiency technologies developed through the ITP partnerships.

PRIORITIES:

- The program is shifting its focus toward using the convening power of government to encourage future industrial cooperation.
- Emphasis will be placed on research and analysis to reduce natural gas and petroleum use in the industrial sector.

Reallocations to Support EERE Priorities:

- The Program will shift toward more crosscutting and transformation research development activities, providing the foundation for the next generation of manufacturing processes to dramatically improve the energy efficiency and environmental performance of the energy-intensive and waste-intensive industries.
- Technical Assistance will continue at a reduced level. The program will explore better technology validation and delivery strategies to increase the adoption of energy-efficiency technologies and operating practices. The Best Practices program will continue to conduct energy savings assessments to reduce manufacturing plant natural gas consumption in support of the Secretary of Energy's "Easy Ways to Save Energy" campaign.

INDUSTRIAL TECHNOLOGIES

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
		Program Goal 04.60.00.00 (Industrial Technologies)		
		Industries of the Future (Specific)		
Commercialize 3 new technologies in partnership with the most energy-intensive industries that improve energy efficiency of an industrial process or product by at least 10 percent.	N/A	N/A	N/A	N/A
		Industries of the Future (Crosscutting)		
An estimated 100 trillion Btus saved by an additional 800 energy intensive U.S. plants applying EERE technologies and services.	N/A	N/A	N/A	N/A
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	N/A	N/A	N/A	N/A

INDUSTRIAL TECHNOLOGIES

Performance Targets (Funding Scenario II – Above Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.60.00.00 (Industrial Technologies)				
Industries of the Future (Specific)				
Commercialize 3 new technologies in partnership with the most energy-intensive industries that improve energy efficiency of an industrial process or product by at least 10 percent.	Commercialize 3 new technologies in partnership with the most energy-intensive industries that improve energy efficiency of an industrial process or product by at least 10 percent.	Commercialize 3 new technologies in partnership with the most energy-intensive industries that improve energy efficiency of an industrial process or product by at least 10 percent.	Commercialize 3 new technologies in partnership with the most energy-intensive industries that improve energy efficiency of an industrial process or product by at least 10 percent.	Commercialize 3 new technologies in partnership with the most energy-intensive industries that improve energy efficiency of an industrial process or product by at least 10 percent.
Industries of the Future (Crosscutting)				
An estimated 100 trillion Btus saved by an additional 800 energy intensive U.S. plants applying EERE technologies and services.	An estimated 100 trillion Btus saved by an additional 800 energy-intensive U.S. plants applying EERE technologies and services.	An estimated 100 trillion Btus saved by an additional 800 energy-intensive U.S. plants applying EERE technologies and services.	An estimated 100 trillion Btus saved by an additional 800 energy-intensive U.S. plants applying EERE technologies and services.	An estimated 100 trillion Btus saved by an additional 800 energy-intensive U.S. plants applying EERE technologies and services.
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

FEDERAL ENERGY MANAGEMENT PROGRAM (FEMP)

Mission and Goals

The mission of the Federal Energy Management Program (FEMP) is to promote energy security, environmental stewardship and cost reduction through energy efficiency and water conservation, report progress toward the Executive Order goals at Federal sites and support energy management activities of the Department of Energy.

The Federal Energy Management Program goal is to provide technical and financial assistance to Federal agencies and thereby lead the Nation by example in the use of energy efficiency and renewable energy. Through the Federal Government's own actions, FEMP's target is to facilitate energy efficiency and renewable energy investments in FY 2007 that will result in lifecycle energy savings of 17.1 trillion Btus. Renewable energy investments are accounted for in this target as displaced conventional energy usage. This target includes only those investments at Federal agencies that can be quantified and directly related to FEMP activities.

These energy savings will help agencies reach the goals set by Executive Order and legislation. In addition to these FEMP-assisted efforts, agencies make additional energy savings investments without direct FEMP assistance and are expected to continue to do so. Federal agencies will need to make significant investments beyond the projects assisted by FEMP to meet the goals set forth by Executive Order 13123 and the Energy Policy Act of 2005 as summarized below:

- Executive Order 13123 establishes that the goal for all Federal agencies is to reduce energy intensity in Federal buildings by 35 percent by 2010 (relative to the 1985 baseline level of 138,610 Btu per gross square foot).
- The Energy Policy of 2005 sets forth the following goals for Federal agencies (including the Department of Energy):
    - Reduce energy consumption per square foot by 20 percent by 2015 compared to the baseline year of FY 2003 at a rate of 2 percent per year.
    - Ensure that at least 3 percent of Federal electricity consumption be generated by renewables in the years FY 2007 through FY 2009; 5 percent in the years FY 2010 through FY 2012; and 7.5 percent in FY 2013 and each fiscal year thereafter.

FEMP employs a variety of approaches to assist agencies in realizing energy, environmental and cost savings potentials, including: direct technical assistance, and assistance in accessing alternative private sector funding. Success occurs when FEMP and its agency and private sector partners enable Federal energy managers to make better energy management choices that result in a more efficient, effective and energy secure government.

FEMP coordinates DOE energy management activities by establishing Departmental policy and guidance and reporting on progress toward Departmental and Executive Order goals. E.O. 13123 and DOE Order 430.2A have established goals for DOE in the areas of energy efficiency, renewable energy, greenhouse gas emissions, water management and energy audits.

Federal Energy Management Program (FEMP) Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007-2011)	18,974	16,906	14,091	14,091	14,091	14,091
Above Target (FY 2007-2011)	18,974	16,906	16,906	16,906	16,906	16,906

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

In managing its programs, the Federal Energy Management Program uses multi-year program planning, peer review and the Federal Energy Management Advisory Committee to identify priorities for program activities. In addition, FEMP leads the Federal Interagency Energy Management Task Force to address energy issues affecting Federal facilities and operations and provide in-depth analysis and recommendations concerning current and pending legislation, technical issues, and coordinated implementation of Federal activities.

In FY 2008 and beyond, direct funding for energy retrofit projects under the Departmental Energy Management Program will be discontinued, although DOE facilities managed by contractors will continue to support energy efficiency improvements through their operating funds. Energy management at the Department of Energy will be integrated with FEMP, taking advantage of the full range of services offered by FEMP, including alternative financing and technical assistance. FEMP will provide policy, guidance and reporting for DOE facilities.

With the passage of the Energy Policy Act of 2005, FEMP is responsible for carrying out a number of activities, including reporting progress toward new goals, and issuing guidance on metering, the procurement of energy efficient products, new construction, and other energy related building topics. FEMP will continue to carry out these responsibilities in the outyears.

PRIORITIES:

Alternative Financing

- In order meet the EPAct 2005 energy savings and renewable energy goals, Energy Savings Performance Contracts (ESPC) help agencies finance energy saving improvements without the need for direct appropriations.

Technical Assistance

- The New Technology Demonstration program introduces recently commercialized energy efficiency and renewable energy technology to the Federal marketplace which can accelerate the adoption of these technologies.

- FEMP provides design assistance on advanced energy efficiency and renewable energy technologies to assist Federal energy managers with new construction and energy retrofit projects.
- FEMP helps agencies acquire the most energy efficient products through FEMP-designated products and bulk purchasing.

Planning, Reporting and Evaluation

- FEMP centralizes data collection, verification and reporting for the Federal agencies and publishes an Annual Report to Congress.
- With the Office of Management and Budget, the Program is developing a new White House energy scorecard which highlights the progress of the Federal agencies.
- Outreach and policy guidance helps agencies meet their goals in an efficacious and consistent manner.

Reallocations to Support EERE PRIORITIES:

In order to meet higher priority goals within EERE, in FY 2008 and beyond, direct funding for energy retrofit projects under the Departmental Energy Management Program will be discontinued. Energy management at the Department of Energy will be integrated with FEMP, taking advantage of the full range of services offered by FEMP, including alternative financing and technical assistance. FEMP will provide policy, guidance and reporting for DOE facilities.

Further streamlining in management, training and communication among other FEMP programs allows for a further reduction in the FEMP budget. In those areas, FEMP expects to be able to achieve the same, or better, results.

FUNDING SCENARIO II – ABOVE TARGET

- The above target is nearly identical to the target scenario. The additional $2.8 million will allow FEMP to institutionalize Energy Savings Efficiency Teams (ESET) to reduce the near-term impact of energy fuel shortages and/or regional market fluctuations by lowering demand at Federal sites. Absent such situations, ESETs will be redeployed at past sites using a broader systems approach to reduce long-term energy demand.

FEDERAL ENERGY MANAGEMENT PROGRAM

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.13.00.00 (Departmental Energy Management Program/Federal Energy Management Program)				
Project Financing/Technical Guidance and Assistance/Departmental Energy Management				
Complete ESPC and UESC contract awards, fund DOE retrofit projects and provide technical assistance that will result in lifecycle Btu savings of 17.1 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 16.8 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 16.8 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 16.8 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 16.8 trillion.
Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

FEDERAL ENERGY MANAGEMENT PROGRAM

Performance Targets (Funding Scenario II – Above Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.13.00.00 (Departmental Energy Management Program/Federal Energy Management Program)				
Project Financing/Technical Guidance and Assistance/Departmental Energy Management				
Complete ESPC and UESC contract awards, fund DOE retrofit projects and provide technical assistance that will result in lifecycle Btu savings of 17.1 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 17.1 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 17.1 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 17.1 trillion.	Complete ESPC and UESC contract awards and provide technical assistance that will result in lifecycle Btu savings of 17.1 trillion.
Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

WEATHERIZATION AND INTERGOVERNMENTAL ACTIVITIES

Mission and Goals

The mission of the Weatherization and Intergovernmental Program (WIP) is to develop, promote, and accelerate the adoption of energy efficiency, renewable energy, and oil displacement technologies and practices by a wide range of stakeholders. These include state and local governments, weatherization agencies, communities, companies, fleet managers, building code officials, and Native American tribal Governments.

- Weatherization Assistance Program Grants contribute to General Goal 4 by providing cost-effective energy efficiency improvements to low-income households through the weatherization of 64,084 low-income homes with DOE funds in FY 2007. Priority is given to the elderly, persons with disabilities, families with children, and households that spend a disproportionate amount of their income on energy bills or have high energy usage (fuel bills consume an average of about 13 percent of household income for low income families, compared to 3.5 percent or less for all other Americans).[1]
- The State Energy Program contributes to General Goal 4 by supporting states' promotion of energy efficiency and renewable energy technologies. The State Energy Program, among other activities, funds the development and maintenance of energy emergency planning at the state and local levels, a critical security benefit. SEP also assists States in developing strategic planning and logic modeling to target individual state energy priorities and increase energy security through diversification.
- The Intergovernmental Activities contribute to General Goal 4 by providing high leveraged technical assistance in targeted communities that accelerates the adoption of clean cost-effective EERE technologies. These activities benefit the public by improving energy productivity, reducing demand, and lessening the burden of energy costs on the disadvantaged. This could lead to the installation of 1000 MW of renewable generation globally by 2015 and 100 MW of generation in Indian country by 2010. Additionally, it is estimated that REPI qualified facilities will generate 16 billion KWh by 2010.

1 Data source: DOE EIA Residential Energy Consumption Survey (RECS).

Weatherization and Intergovernmental Activities Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Weatherization Assistance	242,550	164,198	160,478	109,348	67,998	76,348
State Energy Programs	35,640	49,457	0	0	0	0
State Energy Activities	495	0	0	0	0	0
Gateway Deployment	25,400	0	0	0	0	0
IREP	3,871	2,473	0	0	0	0
Tribal	3,960	3,957	3,957	3,957	3,957	3,957
REPI	4,950	4,946	4,946	4,946	4,946	4,946
Target (FY 2007–2011)	**316,866**	**225,031**	**169,381**	**118,251**	**76,901**	**85,251**
Weatherization Assistance	242,550	164,198	164,198	164,198	164,198	164,198
State Energy Programs	35,640	49,457	49,457	49,457	49,457	49,457
State Energy Activities	495	0				
Gateway Deployment	25,400	0				
IREP	3,871	2,473	2,473	2,473	2,473	2,473
Tribal	3,960	3,957	3,957	3,957	3,957	3,957
REPI	4,950	4,946	4,946	4,946	4,946	4,946
Above Target (FY 2007-2011)	**316,866**	**225,031**	**225,031**	**225,031**	**225,031**	**225,031**

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

EERE continues to refine its program portfolio to accelerate and expand contributions to high priority activities for technology development, which are critical national objectives. We concluded that reducing America's growing dependence on oil is the highest priority for the Office of Energy Efficiency and Renewable Energy. As a result, resources are being shifted from the Weatherization and Intergovernmental Program to other higher priority technology development programs.

- The Weatherization Assistance subprogram will maintain emphasis on maximum production of homes weatherized, the Weatherization evaluation and providing the core infrastructure that attracts and enables leveraged funding that expands the program's services significantly.
- The State Energy subprogram federal funding request will end in FY 2008. Over the last 10 years, DOE has facilitated the development of an extraordinary network of States that are engaged in developing and delivering meaningful and effective energy programs tailored to meet unique state needs. The lessons learned and state models developed have provided sufficient

knowledge, case studies, and tools that would enable any interested State with the resources to support successful state energy programs. In FY 2007 DOE will work with States to consolidate and transfer the results of the energy program investments into a central and readily accessible state managed repository.

- The International Renewable Energy subprogram (IREP) federal funding request will end in FY 2008. Resources are being shifted to focus on domestic energy challenges.
- The Tribal Energy and Renewable Energy Production subprograms have level funding profiles through FY 2011.
- The Gateway subprogram activities have been realigned, locating them where they directly impact a specific technology (e.g., Rebuild America to Building Technologies and Clean Cities to Vehicle Technologies). This refocusing of our deployment activities reinforces the systems approach to technology development.

Reallocations to Support EERE Priorities:

- The reduction in Weatherization and Intergovernmental funding will enable greater investments in advanced R&D within the EERE portfolio that can address critical national priorities: reducing dependence on oil; accelerating the development of clean electricity supply options; and developing highly efficient new technologies and products for our homes and buildings. This reduction is part of our shift to advance research and development to promote more fundamental and substantial breakthroughs that can benefit all Americans, including the low-income population.
- The Weatherization Program will continue to provide State formula grants to enable the weatherization of low-income homes, which internal program estimates suggest could save $1.48 in energy costs for every dollar invested over the life of the measures (based on current EIA energy price data).
- The elimination of the International Renewable Energy subprogram will result in a shift to domestic advanced research and development.

FUNDING SCENARIO II - ABOVE TARGET

Priorities and Assumptions:

EERE continues to refine its program portfolio to accelerate and expand contributions to high priority activities for technology development, which are critical national objectives. We concluded that reducing America's growing dependence on oil is the highest priority for the Office of Energy Efficiency and Renewable Energy. In a growth scenario, Weatherization and Intergovernmental activities would be funded to support energy efficiency and renewable energy activities.

- The Weatherization Assistance subprogram has a level funding profile through FY 2011.
- The State Energy subprogram has a level funding profile through FY 2011. Continued funding of the State Energy subprogram will support State Energy Offices that rely on Federal funding to pay for staffing. It will also support short and medium range deployment of alternative fuels, solar, biomass, buildings and industrial technologies in states.

- The Tribal Energy subprogram has a level funding profile through FY 2011.
- The Renewable Energy Production Incentive subprogram has a level funding profile through FY 2011.
- The International Renewable Energy subprogram has a level funding profile through FY 2011.

WEATHERIZATION AND INTERGOVERNMENTAL ACTIVITIES

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.09.00.00 (Weatherization)				
Weatherization Assistance Grants				
Weatherize 64,084 homes with DOE funds.	Weatherize 61,159 homes, with DOE funds.	Weatherize 40,082 homes, with DOE funds.	Weatherize 24,750 homes, with DOE funds.	Weatherize 27,534 homes, with DOE funds.
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

WEATHERIZATION AND INTERGOVERNMENTAL ACTIVITIES

Performance Targets (Funding Scenario II – Above Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.09.00.00 (Weatherization)				
Weatherization Assistance Grants				
Weatherize 64,084 homes with DOE funds.	Weatherize 62,687 homes, with DOE funds.	Weatherize 61,761 homes, with DOE funds.	Weatherize 61,619 homes, with DOE funds.	Weatherize 60,709 homes, with DOE funds.
Program Goal 04.10.00.00 (State Energy Program Grants)				
State Energy Program Grants				
Achieve an average annual energy savings of 12-14 trillion source Btus (an estimated $72-78 million in annual energy cost savings) with DOE funds.	Achieve an average annual energy savings of 12-14 trillion source Btus (an estimated $72-78 million in annual energy cost savings) with DOE funds.	Achieve an average annual energy savings of 12-14 trillion source Btus (an estimated $72-78 million in annual energy cost savings) with DOE funds.	Achieve an average annual energy savings of 12-14 trillion source Btus (an estimated $72-78 million in annual energy cost savings) with DOE funds.	Achieve an average annual energy savings of 12-14 trillion source Btus (an estimated $72-78 million in annual energy cost savings) with DOE funds.
Maintain total administrative overhead costs (defined as program direction and program support excluding earmarks) in relation to total program costs of less than 12 percent.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.	Maintain total Program Direction costs in relation to total program costs in the range of 8% - 12% to demonstrate efficient and effective EERE-wide business and technical support to mission direct programs.

Office of Electricity Delivery and Energy Reliability (OE)
Five Year Plan
FY 2007 – FY 2011

OVERVIEW:

Disruptions to the Nation's energy supplies—most commonly in the form of electricity disruptions—cost the United States billions of dollars each year and can jeopardize the safety and well-being of millions of Americans and U.S. industry. The 2003 Northeast blackout and the devastation to the Gulf Coast due to Hurricane Katrina serve as grim reminder of this fact. Disruptions and congestion underscore the importance of managing supply and demand. Adequate base-load and peak electricity generation must be balanced with base-load and peaking demand and adequate transmission and delivery systems. The Office of Electricity Delivery and Energy Reliability (OE) is at the forefront of efforts to modernize the Nation's electric grid, enhance security and reliability of the energy infrastructure, and facilitate recovery from disruptions to the energy supply. These endeavors will help ensure that the Nation will have adequate and reliable energy supplied from the President's initiatives for nuclear, biomass, solar, and clean coal energy supply.

OE uses the Administration's Research and Development (R&D) investment criteria to plan and assess programs and projects. The criteria were developed in 2001 and further refined with input from agencies, Congressional staff, the National Academy of Sciences, and numerous private sector and nonprofit stakeholders.

The chief elements of the R&D investment criteria are quality, relevance, and performance. Programs must demonstrate how they meet the requirements of each criterion. For example, to demonstrate relevance, programs are expected to have complete annual and multi-year plans with clear goals and priorities. To demonstrate quality, programs are expected to commission periodic, independent expert reviews. Criteria in these reviews include relevance to overall program objectives, approach to performing the research and development, partnerships, collaborations, project management, technical accomplishments, and technology transfer.

Additional criteria were used by OE to assess and balance R&D activities to ensure relevance to industry needs and the appropriateness of the federal role. Key elements of the criteria include: the appropriateness and need for Federal assistance; relevance to the industry and the marketplace; identification of a transition point to industry commercialization (or of an off-ramp if progress does not meet expectations); risk; and the potential public benefits, compared to alternative investments that may accrue if the technology is successfully deployed.

OE's R&D subprogram was recently evaluated with respect to portfolio balance. The portfolio assessment included the R&D criteria mentioned above and this five-year plan incorporates the results of that assessment.

[1]Office of Electricity Delivery and Energy Reliability Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	161,878	124,928	120,748	120,098	118,475	119,903
Above Target (FY 2007-2011)	0	0	154,748	154,098	152,475	123,903

Mission and Goals:

The mission of the OE is to lead national efforts to modernize the electric grid, enhance security and reliability of the energy infrastructure, and facilitate recovery from disruptions to the energy supply. Electricity Delivery and Energy Reliability has the following goals:

- Energy Strategic Goal - to protect our national and economic security by reducing imports and promoting a diverse supply of reliable, affordable, and environmentally sound energy;

- General Goal Energy Security - improve energy security by developing technologies that foster a diverse supply of affordable and environmentally sound energy by providing for reliable delivery of energy, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency; and

- Program Goal - lead national efforts to modernize the electric grid, enhance security and reliability of the energy infrastructure, and facilitate recovery from disruptions to the energy supply.

The Office of Electricity Delivery and Energy Reliability executes its mission through the activities of the two subprograms, Research and Development and Operations and Analysis. R&D subprogram contributes to the goals by improving the resiliency, as well as the system efficiency of the electric delivery system, including an increase in the utilization of transmission and distribution assets to reduce congestion. Assets include advanced cables and on-site generation, storage and load management technologies.

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1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

Operation and Analysis contributes by focusing on 1) implementing the mandatory electricity grid modernization requirements for DOE in the Energy Policy Act of 2005; working with States and regions to improve their electricity-related laws, regulations, and policies; and permitting of cross-border electricity trade all of which to help achieve "modernizing the electric grid" and "enhancing reliability of the energy infrastructure"; and 2) carrying out Departmental responsibilities under the Homeland Security Presidential Directives Seven "Critical Infrastructure Identification, Prioritization and Protection" and Eight "National Preparedness", and the National Response Plan implementing the Robert T. Stafford Act, to protect critical energy infrastructure and to help restore it during energy disruptions.

OE Research and Development:

The mission of the Research and Development subprogram is to improve resiliency, facilitate recovery, reduce congestion, and better manage supply and demand of the nation's electric grid through the development of advanced power systems for electric grid applications. The Subprogram's R&D efforts in Visualization and Controls, High Temperature Superconductivity, Distributed Energy and Storage and Power Electronics are needed to provide the electric power industry with new technologies to improve the reliability, energy efficiency, system efficiency and security of the Nation's electricity delivery system. R&D activities will: 1) harden the energy infrastructure so it can detect, prevent and mitigate external disruptions in energy supplies; 2) strengthen grid stability and reduce the frequency and duration of operational disturbances and power outages; 3) increase the efficiency and flexibility of the electric delivery system; and 4) find new ways to reduce peak demands; 5) increase asset utilization (capacity factor for transmission and distribution); and 6) improve access to markets for a variety of generation sources that may be located far from load centers.

Specifically, Visualization and Controls R&D will focus on transmission and distribution operations [EPACT 925(F)]. Activities will provide information systems and control devices will reduce the decision time required to react to disturbances on the grid, improve communications among system operators across jurisdictional boundaries, improve security, and improve recovery (through standard control technologies including, for example, transformers, sensors, communications equipment, and fault current limiters).

The R&D activities will focus on two paths for managing electricity supply and demand as well as reducing congestion. High Temperature Superconductivity R&D will advance the science of superconducting materials and accomplish applied research for second generation superconducting wires. Distributed Energy and Storage R&D will demonstrate the ability to manage electricity supply and demand locally through the application of distributed energy and storage technologies involving integrated configurations to optimize system efficiency. The activities will demonstrate reduction in peak load, greater system efficiency, and higher levels of asset utilization. Additionally, load isolation procedures for critical facilities and communities will be developed.

Power Electronics and Materials R&D will involve applied science activities to explore lower cost technologies of power electronics and advanced materials for devices capable of operating efficiently at higher temperatures, as well as for thermal management, storage, and dielectrics.

Research and Development Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	136,289	95,636	91,877	91,300	89,585	91,126
Above Target (FY 2007-2011)	136,289	95,636	121,877	121,300	119,585	91,126

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

The priorities for the R&D program are based upon improving the resiliency of the grid and reducing congestion. Strategic planning activities and peer reviews with stakeholders nationally and internationally, Federal Energy Regulatory Commission, North American Electric Reliability Council provided guidance to the Office on focusing its research on activities that:

1. Facilitate common visualization and control technologies that allow Regional Transmission Organizations and Independent Electricity System Operator organizations to understand system behavior across jurisdictions to prevent future cascading failures and improve response times during recovery. No other research organization supports technology development for global monitoring of the transmission system. Information on the health of the system is vital to economic stability of markets.

    - The long-term goal for this activity is as follows: By 2014, develop an automatic, smart, switchable network for transmission system operations that fully monitors and controls major regions of the grid.

2. Conduct applied research in power electronics and superconducting materials to spur innovation. New insulation materials and dielectrics could also catalyze modernization.

    - The long-term goal for this activity is as follows: Demonstrate a prototype power conditioning system with a 30% reduction in commercial cost and twice the power density of a same-size conventional system by 2015.

3. Increase power density and manage loads. There are solutions for improving power system efficiencies, reliability, and security at the local level. Cost-effective solutions can often be implemented at or near the load or the location where additional line capacity is required. Whether provided remotely or locally, electricity supply must be matched with demand.

The long-term vision for this activity is as follows:

- By 2015, demonstrate a microgrid system that reduces by 20% the need for generation, transmission, and distribution capacity upgrades/additions at an equal or lower cost for both existing feeder and "greenfield" locations. Microgrid options for achieving this include, but are not limited to, operational strategies such as dynamic pricing and load management, capacitor banks, energy storage devices, distributed generation systems, loss reductions, and phase balancing.

4. Support development of second generation (2G) high temperature superconducting wires for widespread use in advanced electric power equipment. For HTS, the long-term goal is as follows:

   - By 2016, using High Temperature Superconductivity wire (when produced in large quantities), achieve 100 times the current capacity of copper wires in 1,000 meter lengths at a cost comparable to copper wire.

Reallocations to Support Priorities:

In FY 2008 The R&D program would discontinue the following activities at the Target level:

- Individual market sector demonstrations of high efficiency cooling heating and power systems,
- large-scale energy storage systems,
- thermal energy technology systems,
- MRI and other non-utility related technologies,
- Advanced fuel flexible combustion systems, and
- Grid friendly appliance control technologies.

FUNDING SCENARIO II - ABOVE TARGET:

Under the above target scenario, the R&D program supports development of superconducting power delivery equipment specifically targeted to relieve grid congestion and improve reliability. These activities will utilize the technology base for superconducting power lines and other superconducting power equipment resulting from the initial prototype development through FY 2007, but will take the next step by proving the groundbreaking power/efficiency improvements already established can be reliably used to modernize the nation's electricity system.

Priorities and Assumptions:

The priority for the program focuses on innovation in advanced materials for the power industry and increasing the power density of power lines using high temperature superconductors.

Reallocations to Support Priorities:

There are no reallocations to support priorities for this scenario.

Operations and Analysis Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	0	12,009	11,484	11,413	11,232	11,390
Above Target (FY 2007-2011)	0	16,009	15,484	15,413	15,232	15,390

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

The priorities for the Operations and Analysis subprogram are to provide the Department of Homeland Security with energy sector expertise needed in preparing the energy component of the National Infrastructure Protection Plan and to respond to single catastrophic events (such as hurricanes, earthquakes, terrorist acts, etc.) and help Federal, State, local and industry entities restore energy during disruptions. The main assumptions behind this scenario are 1) DOE continues to be the Sector Specific Agency for the energy sector; 2) energy assets continue to be owned and operated primarily by the private sector; and 3) State governors continue to have primary authority within their jurisdictions concerning such issues as fuel allocations and power restoration prioritization.

These activities include continued monitoring of implementation of the recommendations from the U.S. Canada Investigation into the 2003 Blackout to make sure preventive measures are actually implemented; and technical assistance to states and regions on improving their electricity related laws, regulations, and policies. While a major theme of the Energy Policy Act of 2005 is grid modernization, the Federal Power Act reserves many major grid responsibilities to the states. Thus achieving grid modernization can not occur with just DOE and FERC implementation of the Energy Policy Act of 2005, and must also include the active involvement of the states, and states working together as regions, which is the reason for DOE to seek to continue its technical assistance efforts with them on state electric policies.

In order to better implement the National Infrastructure Protection Plan and National Response Plan, Operations has identified the following priorities:

- Clarify ESF-12 POC for information requests and disseminate to external sources.
  - ESF-12 is engaging in a “lessons learned” activity to streamline reporting and communications. We have established liaison with our partner agencies, and have established POCs at the local and state level. Our long-term goal is to remove friction and

overlap among and between various jurisdictions with our partners. Our short –term goal is to have POC info disseminated by June 30, 2006

- Develop inventory of available DOE resources for emergency energy restoration.
  - Decision memo to Secretary for conducting inventory with DOE offices completed by March 31, 2006.
  - First draft library of key energy infrastructure facilities and assets completed by June 30, 2006.
- Ensure that deployed teams are adequately provisioned with a standardized suite of equipment
  - Establish a deployment kit, delivered to train prevention and response team members by June 2006
  - Long-term – Identify standard suite of electronic, communications and deployment equipment; establish standardized computer desktop at all Ops Centers.
- Determine personnel requirements to meet NRP obligations.
  - Increase the number of DOE responders by 5% to increase coverage and productivity, utilizing trained volunteers from across the DOE complex

Reallocations to Support Priorities:

For the Permitting, Siting, and Analysis function of Operations and Analysis, while of priority, activities to encourage states, regions, and the electric industry to modernize the electric grid and improve its reliability, are not mandatory by law and thus are of necessity of lower priority than legally mandated work. Funding for this work is reduced to make room for higher priority newly legally mandated work from the Energy Policy Act of 2005 as well as from other existing laws governing cross-border permitting of electricity trade. For example, technical assistance is not proposed for many states and regions that request it, even though grid modernization called for by the Energy Policy Act of 2005 can not occur without active involvement of states and states working together as regions. Nor is funding proposed for monitoring of implementation of the recommendations to prevent future blackouts that came out of the U.S. –Canadian Joint Investigation of the Blackout Report of 2004.

FUNDING SCENARIO II- ABOVE TARGET:

Operations and Analysis would focus on, 1) increasing by one third technical assistance and analytical support to States and regions for policies, market mechanisms, and activities that facilitate competitive, reliable, environmentally sensitive and customer-friendly wholesale and retail electric markets; 2) better issuing timely processing of permits for cross-border electricity trade and coordination of federal transmission permit applications, 3) restoring work on electricity reliability that was put aside due to enactment of mandatory Energy Policy Act of 2005 provisions, such as issuing a report card on industry and government compliance with recommendations stemming from the U.S.–Canadian Investigation into the 2003 blackout; and 4) improving communications and data manipulation capabilities by office personnel responding to energy disruptions and updates to the systems used to predict and display the results of specific natural disasters and terrorist acts.

Priorities and Assumptions:

The priorities and assumptions for Operations and Analysis are unchanged from Scenario I.

Reallocations to Support Priorities:

There are no reallocations to support priorities for this scenario.

OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Targets
Program Goal: Improve the resiliency of the electric grid				
Demonstrate the automatic control of reactive power on a utility grid using real time data from a phasor measurement-based system and publish a report on the findings.	Produce "tool kit" version 1.0 with software to assess and quantify the benefits on a common basis of vendor-developed state estimator upgrades incorporating real-time phase angle measurements.	Produce "tool kit" version 1.1 with software to establish a baseline for normal operating conditions and limits for grid operations by analyzing real-time measurements in preparation for setting alarms for out-of-limit operations. Implement measurement systems across 40% ISO/RTOs	Produce "tool kit" version 1.2 with software to provide a Dynamic Security Assessment (voltage) tool that dynamically assesses the security margins across key transmission lines/corridors in real time that is available from one or more vendors.	Produce "tool kit" version 1.3 with software application that detects transient stability (power flow instability) over a region of the grid and enables a dynamic response to control against the evolution of large grid disturbances that is available to grid operators. Demonstrate adaptive islanding on a region of the grid that intentionally separates the grid into self-sustaining islands to prevent wide-area blackouts.
	Design a next generation power conditioning system (PCS) with a 5% reduction in benchmark cost and 10% increase in power density. Initiate new materials initiative and investigate nano-structured materials for PCS.	Design a next generation PCS with a 10% reduction in benchmark cost and 30% increase in power density. Design new components resulting from new materials initiative.	Prototype next generation PCS with a 10% reduction in benchmark commercial cost and 30% increase in power density. Develop prototype components resulting from new materials initiative.	Design a next generation PCS with a 15% reduction in benchmark cost and 50% increase in power density, incorporating lessons learned from prototype components and system.
Program Goal: Reduce Congestion in defined congested corridors				
Complete data collection and monitoring on four pioneering energy storage systems in collaboration with the California Energy Commission and the New York State Energy Research and Development Authority. Develop second packaged CHP system which operates at 70+% efficiency.	Complete simulation analysis and integrated resource modeling on three congested circuits to validate 20% reduction in capacity upgrades at equal or less costs.	**Down-select** the most promising projects and demonstrate a **10%** increase in load factor on a congested distribution circuit at a cost less then the estimated capital cost of infrastructure needed to meet the additional load growth through traditional infrastructure expansion	Complete simulation analysis and integrated resource modeling on a greenfield microgrid area to demonstrate cost-effective asset management and capacity utilization.	**Down-select** the most promising projects and demonstrate a **20%** increase in load factor on a congested distribution circuit at a cost less then the estimated capital cost of infrastructure needed to meet the additional load growth through traditional infrastructure expansion

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Targets
Complete six months operation of superconducting cable operating on the grid at greater than 10 kilovolts.	Produce 250 meters of wire with the current carrying capacity of 30 times that of copper. FY 2008 → 30% of target	Produce 500 meters of wire with the current carrying capacity of 40 times that of copper. FY 2009 → 40% of target	Produce 750 meters of wire with the current carrying capacity of 60 times that of copper. FY 2010 → 60% of target	Produce 1,000 meter length of superconducting wire that can carry 80 times the current of copper and is cost competitive with conventional copper wires. Demonstrate a small-scale power equipment components. FY 2011 → 80% of target
		Electricity Delivery and Energy Reliability		
Maintain total Research and Development Program Direction costs in relation to total Research and Development costs of less than 12%	Maintain total Research and Development Program Direction costs in relation to total Research and Development costs of less than 12%	Maintain total Research and Development Program Direction costs in relation to total Research and Development costs of less than 12%	Maintain total Research and Development Program Direction costs in relation to total Research and Development costs of less than 12%	Maintained total Research and Development Program Direction costs in relation to total Research and Development costs of less than 12%.[1]
		Program Goal: Permitting, Siting, and Analysis		
Meet all statutory deadlines associated with all Presidential permitting requests.	Meet all statutory deadlines associated with all Presidential permitting requests.	Meet all statutory deadlines associated with all Presidential permitting requests.	Meet all statutory deadlines associated with all Presidential permitting requests.	Meet all statutory deadlines associated with all Presidential permitting requests.
		Program Goal: Infrastructure Security and Energy Restoration		
Conduct energy emergency responder training prior to June 1. Revise the energy emergency concepts of operation plan to incorporate lessons learned from previous hurricane seasons by May 15.	Conduct energy emergency responder training prior to June 1. Revise the energy emergency concepts of operation plan to incorporate lessons learned from previous hurricane seasons by May 15.	Conduct energy emergency responder training prior to June 1. Revise the energy emergency concepts of operation plan to incorporate lessons learned from previous hurricane seasons by May 15.	Conduct energy emergency responder training prior to June 1. Revise the energy emergency concepts of operation plan to incorporate lessons learned from previous hurricane seasons by May 15.	Conduct energy emergency responder training prior to June 1. Revise the energy emergency concepts of operation plan to incorporate lessons learned from previous hurricane seasons by May 15.

1The baseline for administrative overhead rate is currently being validated.

Performance Targets (Funding Scenario II – Above Target).

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
	Program Goal: Power Delivery Research Initiative.			
	Design and develop a test bed to certify superconducting equipment able to withstand high fault current conditions while maintaining grid reliability.	Complete test performance of power equipment in voltage and voltage impulse at cryogenic conditions.	Develop at least one modeling tool to assess reliability and functional behavior of grid-connected superconducting equipment.	
	Develop power lines for operation at 138 kV 574 MW.	Develop equipment to operate at 150 kV and 590 MW.	Develop equipment to operate at 161 kV and 600 MW.	
	FY 2008 → 30% of target	FY 2009 → 45% of target	FY 2010 → 55% of target	
	PSA Program Goal: Enactment of state and regional electric policies, and implementing DOE-relevant legal mandates, that enable grid modernization that improves reliability, fuel diversity, cleanliness, and consumer cost			
Increase by 1/3 states and regions that receive technical assistance on electric policies	Increase by 1/3 states and regions that receive technical assistance on electric policies	Increase by 1/3 states and regions that receive technical assistance on electric policies	increase by 1/3 states and regions that receive technical assistance on electric policies	Increase by 1/3 states and regions that receive technical assistance on electric policies
Report on implementation by electric industry, the new Electricity Reliability Organization , government agencies of recommendations in U.S. – Canadian Blackout Investigation of August 2003 Blackout	Develop analytical capabilities (modeling, data, tools) to respond to requests for evaluation of alternative electricity policy proposals			

Energy Information Administration
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

At a time of growing public and policy attention to energy issues, the Energy Information Administration (EIA) is increasingly called upon to provide timely energy information and analysis to promote the efficient functioning of energy markets, assist the Administration and Congress in their deliberations regarding national and international energy policy, markets, and investments, and inform the public. EIA is the Nation's premier source of objective energy information, analysis, and forecasting.

As domestic and global energy markets restructure and become increasingly more complex and interdependent, EIA must update, refocus, and improve its energy data collection and analysis capabilities to maintain the quality, timeliness and relevance of its products to meet the critical customer needs.

EIA continually reassesses and prioritizes its activities to assure the best use of available resources. In 2002, EIA was asked to initiate the *Weekly Natural Gas Storage Survey* to keep critical close-to-real-time information flowing to natural gas markets after the American Gas Association stopped its own storage survey due to concerns over potential liability. In 2005, EIA began its monthly natural gas production survey to meet the pressing need for more accurate and timely data on natural gas production in an era of tight markets and high volatility in natural gas prices. EIA has eliminated other programs to focus resources on its most critical priorities. In 2005, EIA terminated the collection of data from municipal and public electric utilities (EIA-412) and in 2006 it is terminating two oil surveys. EIA's FY 2007 budget proposes to stop collecting data on power plant emissions and emissions control equipment, shifting resources towards maintenance of its core analysis capabilities and improving international oil and gas data, a key recommendation of the June 2005 G-8 summit. EIA is also increasing the use of Internet data collection to improve the timeliness and quality of its energy survey programs while increasing their efficiency.

[1] Energy Information Administration Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	85,314	89,769	87,000	87,000	85,000	86,000
Above Target (FY 2007-2011)	85,314	89,769	93,578	96,572	99,662	102,852

Mission and Goals:

The mission of the Energy Information Administration is to be a leader in providing high-quality, policy-neutral energy information to meet the requirements of Congress, the Federal Government, industry, and the public in a manner that promotes sound policymaking, efficient markets, and public understanding. At the Above Target targets, the following FY 2007 indicators establish specific long term goals that the EIA program is committed to, and progress can be measured against:

- Timeliness of EIA Information Products: 90 percent of selected EIA recurring products meet their release date targets.

- Quality of EIA Information Products: 90 percent or more of customers are satisfied or very satisfied with the quality of EIA information.

- Efficiency Measure: Actual costs for a specific set of surveys, released on schedule, will be less than the baseline adjusted for inflation.

The size of EIA's budget and its continual efforts to improve efficiency set the bounds for tradeoffs that must be made among the three key dimensions of EIA's energy information program: timeliness, quality, and comprehensiveness. Under alternative scenarios of available resources, adjustments are generally made across all three dimensions, as illustrated in the two funding scenarios presented herein.

One challenge EIA faces is that roughly 60 percent of its budget is used to pay or directly support Federal Staff. The cost of salary and benefits and space rental are not directly under EIA management's control, and as recent history has shown, these costs have escalated at a faster rate than assumed. Given the high share of personnel-related costs in EIA's budget, stagnant or falling budgets in nominal dollars imply a diminution of services over time, even after efficiency gains are taken into account.

1The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

GPRA Unit Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	85,314	89,769	87,000	87,000	85,000	86,000
Above Target (FY 2007-2011)	85,314	89,769	93,578	96,572	99,662	102,852

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

EIA's priority is to maintain high quality, core energy data programs and forecasting methods essential to providing timely energy information, analysis, and forecasts. Accurate and timely data drives investment and trade decisions, and contributes to market efficiency and stability.

The expectation Congress will continue to legislate the level of pay increases for Federal employees whose salaries and benefits are the dominant component of EIA's budget together with the reduction in nominal dollar budgets in the Target Scenario (Scenario I) implies that EIA services would necessarily diminish from their FY 2007 level despite ongoing efficiency improvements. EIA would continue to collect, analyze, and disseminate energy information, and provide analyses and forecasts to Congressional and Administration energy policymakers, and the public. EIA would accomplish its mission through the use of surveys, expert analyses, and various information collection and dissemination techniques, most notably the Internet.

Reallocations to Support Priorities:

At the FY 2008 $87.0 million target, EIA would make the following changes:

- Cancel the scoping activities and potential redesign and replacement of the outdated, 15-year old National Energy Modeling System (NEMS) proposed in the Administration's FY 2007 budget request. EIA would forgo: 1) improvements in model structure and technology data needed to address new policies and technologies; 2) changes to allow the use of advanced solution methods, resulting in improved accuracy, stable solutions, and reduced time for simulations; 3) more accurate modeling of unconventional natural gas, which is an increasingly important component of overall natural gas supply affecting both overall deliverability and price; and 4) more explicit representation of hydrogen production and distribution to allow for rigorous assessments of the potential role and implications of hydrogen as a major energy carrier. Cancellation of this project, which addresses the deferred maintenance backlog of a key analytical tool that is relied upon by Congress, the Administration, and the private sector, would significantly degrade EIA's ability to inform policymakers and the public about the Nation's mid-term energy outlook and the potential implications of alternative policy proposals.

- Terminate the international oil and gas data activities proposed in FY 2007 that would improve global oil and gas data and modeling capabilities and provide the basis for an enhanced global

dialogue on the development and use of these key energy resources as envisioned in the 2005 G-8 Summit Declaration. Specifically, EIA would:

- Terminate efforts to evaluate the potential oil and gas supply capabilities of the major hydrocarbon provinces of the world working in partnership with the U.S. Geological Survey.
- Cancel planned updates to the tools used for analysis of global competition for stranded natural gas resources, which can be used as a source of liquefied natural gas (LNG) supply or as feedstock in a gas-to-liquids plant. These improvements are essential to assess the role of LNG in the U.S. energy market, since EIA's existing LNG model is no longer reliable given fundamental changes in technologies and world energy market conditions.
- Curtail petroleum and natural gas data security, reliability, and quality assurance activities that would analyze the statistical design of selected petroleum and natural gas surveys and review and maintain the survey frames which are reaching the end of their life-cycle. Without these activities, data quality will degrade as EIA will be less able to resolve data discrepancies, keep abreast of changes in the energy industry, and select statistical samples and methods that produce accurate statistics, reports, and analyses.

- The FY 2008 EIA staff level would be reduced to 357 full time equivalents (FTEs), a decrease of 18 FTEs compared to the level proposed in FY 2007 and 12 FTEs compared to FY 2006.

At the FY 2009 $87.0 million target level, EIA would need to make additional adjustments that would further degrade the timeliness, quality, and comprehensiveness of its energy information program. EIA would continue to protect the availability and quality of critical petroleum, natural gas, and coal supply data by focusing cutbacks in other areas, including petroleum marketing and voluntary greenhouse gas reductions reporting. Specifically, EIA would:

- End activities associated with the Voluntary Reporting of Greenhouse Gases, which supports the President's Climate Change Initiative. This activity collects information from entities regarding actions taken to reduce their greenhouse gas emissions. Without this activity, EIA would no longer produce the only consistent and comprehensive annual report that quantifies total voluntary emissions reductions.

- Terminate the operation of two major petroleum marketing surveys, the *Resellers'/Retailers' Monthly Petroleum Product Sales Report* (EIA-782B) and the *Monthly Report of Prime Supplier Sales of Petroleum Products Sold to Local Consumption* (EIA-782C). The EIA-782B, which collects and reports monthly petroleum product sales price and volume data at the State level for gasoline, distillate fuel oil, propane, and residual fuel, is used by State energy programs, Federal agencies including the Federal Highway Administration and Federal Trade Commission, and in the evaluation of Low Income Housing Energy Assistance Program (LIHEAP) and the Weatherization program. The EIA-782C collects and reports monthly prime supplier (refiners, gas plant operators, importers, petroleum product resellers, and petroleum product retailers) sales of selected petroleum products into the local markets of ultimate consumption. The States depend on this information to formulate energy policies and develop energy emergency contingency plans. With the termination of these activities, the critical information and support provided to these Federal and State programs would also be terminated.

- The FY 2009 EIA staff level would be reduced by an additional 2 FTEs to 355 FTEs.

At the FY 2010 $85.0 million target level, further cutbacks would be necessary. Three additional surveys in the petroleum marketing program would be eliminated to avoid cuts or quality degradation in petroleum supply data. The single most expensive energy end-use consumption survey, which covers commercial buildings, would be eliminated to conserve the remaining EIA resources to continue operating the manufacturing and residential end-use consumption surveys that are of immediate interest to policymakers concerned with home energy costs and the impacts of energy price changes on industrial competitiveness. Specifically, EIA would:

- Terminate the operation of the *Commercial Buildings Energy Consumption Survey* (CBECS), which is the Nation's definitive, Congressionally-mandated national survey of commercial building energy use in conjunction with characteristics of buildings and their occupants. CBECS, which receives some co-funding from states and EERE programs, provides an understanding of factors driving energy use in the commercial sector, which accounts for one-third of the Nation's electricity use, and provides the information necessary for increased energy efficiency in that sector. Without CBECS data, EIA and other users would be unable to track the effectiveness of energy efficiency standards in the commercial sector. Projections of commercial sector energy use by EIA and non-government analysts would be less reliable without baseline data. Not operating CBECS would free up the 4 FTE positions associated with this survey and $1.7 million in annual support services resources used to conduct the survey.

- Terminate three additional petroleum marketing surveys, the *Refiners' Monthly Cost Report* (EIA-14), the *Refiners'/Gas Plant Operators' Monthly Petroleum Product Sales Report* (EIA-782A), and the *Annual Fuel Oil and Kerosene Sales Report* (EIA-821).

    - Loss of the EIA-14, which collects net acquisition costs and volumes of crude oil, both domestic and imported, from all U.S. refineries on a corporate national and regional basis, would preclude the reliable estimation of average feedstock costs to refining that is needed to project refinery sector profitability and petroleum product costs. Since the bulk of oil acquired and refined is obtained under long term contracts for which there are no sources on volumes and prices other than the EIA-14, reliance on spot market price data would significantly reduce the quality of estimates.
    - Loss of the EIA-782A, which collects State-level information on price, supply, and market distribution from refiners on an end-use-sector basis for fourteen petroleum products would affect the same customers hurt by the termination of the EIA-782B and 782C in the prior fiscal year. In addition, the Defense Fuel Supply Center would not have the data to perform market price analysis in support of their fuel procurements, likely resulting in higher fuel acquisition costs.
    - Termination of the EIA-821, which collects information on the sales of distillate, residual fuel oils and kerosene by end use and State of destination, reported by a sample of fuel oil dealers in the 50 States and the District of Columbia, would result in the loss of the data critical to determining the allocation of $1.2 billion of funds for the LIHEAP. In addition, the Internal Revenue Service (IRS) would no longer have this data to determine taxes on products such as diesel fuel and kerosene, leaving the IRS with the need to develop their own data collection process.

- EIA would also make reductions in its Web management team, which would impact design, functionality, and access, and degrade adherence to DOE and Government-wide standards. EIA's FY 2010 staff level would be further reduced to 351 FTEs.

At the FY 2011 $86.0 million target level, while protecting surveys having the most immediate market impact, EIA would terminate several additional energy analysis and quality assurance activities, allowing for degradation in additional products which have historically been viewed as critical to the understanding of the energy industry and markets, and further reduce EIA energy information dissemination services. EIA would:

- Significantly curtail natural gas analysis and quality assurance activities which address issues arising from industry and regulatory changes and new requirements. The activity would no longer produce the *Natural Gas Weekly Update* and the *Retail Restructuring Report*, which support the scope and frame for the *Natural Gas Marketers Survey* (EIA-910). EIA would no longer have the ability to report on the development and updating of the wellhead gas price series that is critical to understanding the role of marketers and others in natural gas market transactions. In addition, EIA would no longer provide support for the updating and maintenance of the GasTran database system, a transmission and storage information system essential for numerous analytical issues, especially quick turnaround assessments of significant disruptions of supplies caused by events affecting critical infrastructure. The Nation would lose critical information and systems that were heavily relied upon in the wake of the 2005 hurricanes, reducing the capability to understand and manage major disruptions in the Nation's natural gas supply system.

- Curtail oil and natural gas reserves and production analyses activities which operate, update, and maintain data systems supporting frames for the reserves and production surveys, *Annual Oil and Gas Reserves Survey* (EIA-23A) and *Monthly Natural Gas Production Survey* (EIA-914). It includes the purchase of commercial well, reservoir, and production information. With the elimination of these resources, EIA would no longer develop estimates for non-sampled operators, resulting in incomplete reserves estimates for the EIA-23A as required by law. The quality of EIA-23A and EIA-914 surveys would deteriorate making data on proved reserves of oil and natural gas and natural gas production less reliable.

- Virtually eliminate the collection, review, and implementation of improvements in EIA products and their dissemination as suggested by EIA's customers.

- EIA anticipates a FY 2011 staff level of 349 FTEs, a seven percent reduction from that proposed in FY 2007.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

The Above Target Scenario for EIA's FY 2008 through FY 2011 program assumes operations and activities are maintained at a level consistent with the $85.3 million FY 2006 appropriation and the $89.8 million FY 2007 request. EIA would continue to operate 61 energy surveys, maintain the National Energy Information Center, produce short and medium-term energy forecasts, and analyze impacts of proposed energy program and policies.

The Above Target Scenario targets deferred maintenance needs that must be addressed to maintain the quality of existing and critical EIA data and analysis products. EIA would focus on data reliability and quality, its top priority; continue to improve international oil and gas markets data to promote efficient and less volatile energy markets; and implement a replacement National Energy Model (NEM) that would reflects energy market changes and could better respond to emerging energy questions.

These activities directly support EIA's mission to be a leader in providing high-quality, policy-neutral energy information to meet the requirements of Congress, the Federal Government, industry, and the public.

Reallocations to Support Priorities:

EIA's priority in the Above Target Scenario is on improving data quality, reliability, and security while providing timely, high-quality data and analysis to inform Congress, the Administration, and the public. The Above Target Scenario allows EIA to begin to tackle the deferred maintenance backlog for its energy models and survey systems and allows EIA programs to keep pace with changes in energy markets and technologies. Effectively, the Constrained Scenario allows EIA to provide a "current services" level of service to its customers while addressing some of the most critical cyber security challenges and other weaknesses in its existing program. However, no new initiatives are proposed in FY 2008 through FY 2011, EIA has scaled back its energy data coverage, analysis and modeling, and EIA has only funded the highest priority data quality and security needs.

The Above Target Scenario would preclude EIA from having to implement the reductions in the comprehensiveness, timeliness, and quality of its energy information program required over FY 2008 through FY 2011 under the Target Scenario and described in detail in the previous section, allowing EIA to maintain service comparable to that envisioned in the Administration's FY 2007 budget proposal. However, the Above Target Scenario reflects continued spending restraint for EIA.

Also, no funding is requested to increase the frequency of the Consumption Surveys ($1.2M) per the House FY 2006 Report Language; restore the *Transportation Energy Consumption Survey* ($0.5M) that was discontinued in the mid 1990s; or conduct External Expert Reviews ($0.9M) as directed in EIA's Program Assessment Rating Tool (PART) evaluation performed in conjunction with the FY 2006 Budget process.

ENERGY INFORMATION ADMINISTRATION
Performance Targets (Funding Scenario I - Target)

With a 7% reduction in FY 2008 escalating to a 16% reduction by FY 2011 as compared to the Above Target Scenario, EIA would cancel NEM, terminate several petroleum marketing surveys and resource analyses, terminate commercial sector energy use assessments, curtail data and cyber security upgrades, and reduce FTEs by 7%, which would have the following impact on EIA's FY 2008 – FY 2011 performance measures.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.61.00.00 EIA's information program is relevant, reliable and consistent with changing industry structures, and EIA's products are accurate and timely.				
Timeliness of EIA Information Products: 90 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 85 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 80 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 80 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 80 percent of EIA recurring products meeting their release date targets.
Quality of EIA Information Products: 90 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information.	Quality of EIA Information Products: 85 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information, not counting dissatisfaction with reduced comprehensiveness of information program	Quality of EIA Information Products: 80 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information, not counting dissatisfaction with reduced comprehensiveness of information program.	Quality of EIA Information Products: 80 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information, not counting dissatisfaction with reduced comprehensiveness of information program.	Quality of EIA Information Products: 80 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information, not counting dissatisfaction with reduced comprehensiveness of information program.
Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost is less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost is less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost is less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost is less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost is less than the baseline adjusted for inflation.

ENERGY INFORMATION ADMINISTRATION

Performance Targets (Funding Scenario II – Above Target)

In the Above Target Scenario based on the FY 2007 Request, EIA would continue 61 energy data surveys, operate the National Energy Information Center, produce short and mid-term energy forecasts, analyze proposed energy policies, and continue development and implementation of NEM. EIA proposes no new initiatives from FY 2008 through FY 2011 and nearly $12 million of identified EIA requirements were not included in the Administration's FY 2007 request and would remain unfunded through the five-year planning horizon.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.61.00.00 EIA's information program is relevant, reliable and consistent with changing industry structures, and EIA's products are accurate and timely.				
Timeliness of EIA Information Products: 90 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 95 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 95 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 95 percent of EIA recurring products meeting their release date targets.	Timeliness of EIA Information Products: 95 percent of EIA recurring products meeting their release date targets.
Quality of EIA Information Products: 90 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information.	Quality of EIA Information Products: 90 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information.	Quality of EIA Information Products: 90 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information.	Quality of EIA Information Products: 90 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information.	Quality of EIA Information Products: 90 percent or more of customers rate themselves in customer surveys as satisfied or very satisfied with the quality of EIA information.
Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost will be less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost will be less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost will be less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost will be less than the baseline adjusted for inflation.	Efficiency Measure: Cost savings realized from a subset of surveys, released on schedule. Target: Actual cost will be less than the baseline adjusted for inflation.

Corporate Management
Five Year Plan
FY 2007 – FY 2011

OVERVIEW:

The Department's mission and strategic goals can only be accomplished through the support provided to the major program offices by the many corporate staff offices. The Corporate Management section highlights the functions, priorities and resource requirements associated with the staff office support in achieving the Department's mission. The staff offices include: Office of the Chief Information Officer; Office of Management; Office of the Chief Financial Officer; Office of Inspector General; Office of General Counsel; Office of Environment, Safety and Health; Office of Security and Safety Performance Assurance; Office of Human Capital Management; Office of the Secretary; Office of Hearings and Appeals; Office of Policy and International Affairs; Office of Economic Impact and Diversity; Board of Contract Appeals; Public Affairs, and Congressional and Intergovernmental Affairs. Discussed below are few examples of the functions performed by the DOE staff offices and how they support the Department.

The **Office of the Chief Information Officer** (OCIO) manages the Department-wide Cyber Security programs and provides assistance and guidance in these areas to all DOE entities. The OCIO also provides advice and assistance to the Secretary of Energy and other senior managers to ensure that Information Technology (IT) is acquired and information resources are managed in a manner that complies with the policies and procedures of Federal legislation, including the Federal Information Security Management Act (FISMA), the E-Government Act, the Clinger-Cohen Act, and the priorities established by the Secretary.

The **Office of Management** (MA) provides centralized direction and oversight for the full range of management, procurement and administrative support and services. MA performs important functions which directly support the mission of the Department in the areas of engineering and construction management, procurement and assistance, administrative services, competitive sourcing, aviation management, executive secretariat support and scheduling and advance activities.

The **Office of the Chief Financial Officer** (CF) assures the effective management and financial integrity of programs, activities, and resources by developing, implementing and monitoring Department-wide policies and systems in the areas of budget administration, program analysis and evaluation, finance and accounting, internal controls, corporate financial systems, and strategic planning.

The **Office of Inspector General** (IG) promotes the effective operation of the Department of Energy and all its components, including the National Nuclear Security Administration and the Federal Energy

Regulatory Commission. This is accomplished through audits, investigations, and inspections designed to detect and prevent fraud, waste, abuse, and violations of law.

The **Office of General Counsel** (GC) is responsible for providing comprehensive legal services to the Secretary and the Department. GC performs important functions that directly support the mission of the Department. These functions include legal counsel with respect to every program and function of the Department, except those relating to the Federal Energy Regulatory Commission. GC assures that the Department operates in compliance with applicable laws and regulations.

The **Office of Environment, Safety and Health** (EH) is committed to ensuring that the safety and health of the Department of Energy workforce and members of the public and the protection of the environment are integrated into all Departmental activities. EH advises the Secretary of Energy on the status of the health and safety of DOE workers, the public, and the environment near DOE facilities. By statute, DOE assumes direct regulatory authority for the safety and health of workers at its facilities, and EH plays an important role by conducting independent reviews of environment, safety, and health performance and providing technical services, resources, and information sharing. DOE is externally regulated by applicable environmental laws administered by other government agencies and EH serves as DOE's advocate to assure that departmental interests are reflected in the formulation of environmental requirements proposed by such agencies. EH develops environment, safety, and health directives and regulations to ensure that DOE's work is conducted efficiently and in a manner that protects workers, the public and the environment. EH also performs Price-Anderson enforcement and funds radiation health studies.

The **Office of Security and Safety Performance Assurance** (SSA) is responsible for the development, promulgation, and evaluation of security programs, and the independent oversight of security: cyber security, emergency management, and environment, safety, and health programs throughout the Department. SSA develops and assists in the implementation of strategies, policies, and technology pertaining to the protection of national security and other critical asset entrusted to the Department; and provides information and analysis regarding the effectiveness, vulnerabilities, and trends of the Department's security, safety, and other programs and functions of interest to departmental senior management and other stakeholders. SSA also provides administrative support to the Office of the Departmental Representative to the Defense Nuclear Facilities Safety Board.

The **Office of Human Capital Management** (HR) performs important functions that directly support the mission of the Department, including: providing leadership and advice to the Department regarding the impact and use of human resource management policies, proposals, programs, and partnership agreements; coordinating programs and developing standards necessary to ensure that Departmental employees maintain the technical qualifications necessary to safely operate DOE facilities; and providing leadership and direction in dealings with Federal and non-Federal organizations regarding the Department's human resources programs and policies.

[1]Corporate Management Target Funding Plan

($ in 000) Corporate Management	FY 2007 Congressional Request	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Office of the Secretary	$ 5,539	$ 5,504	$ 5,528	$ 5,543	$ 5,617
Competitive Sourcing	$ 2,982	$ 2,963	$ 2,976	$ 2,984	$ 3,024
Chief Information Officer	$ 108,822	$ 108,133	$ 108,615	$ 108,908	$ 110,356
Chief Financial Officer	$ 36,790	$ 36,557	$ 36,720	$ 36,819	$ 37,309
Management	$ 55,237	$ 54,887	$ 55,132	$ 55,281	$ 56,016
Human Capital Management	$ 22,029	$ 21,889	$ 21,987	$ 22,046	$ 22,340
Board of Contract Appeals	$ 147	$ 146	$ 147	$ 147	$ 149
Hearings and Appeals	$ 4,422	$ 4,349	$ 4,380	$ 4,380	$ 4,473
Congressional and Intergovernmental Affairs	$ 4,866	$ 4,835	$ 4,857	$ 4,870	$ 4,935
Public Affairs	$ 4,419	$ 4,391	$ 4,411	$ 4,422	$ 4,481
General Counsel	$ 24,725	$ 24,568	$ 24,678	$ 24,745	$ 25,074
Policy and International Affairs	$ 19,876	$ 19,750	$ 19,838	$ 19,891	$ 20,156
Economic Impact and Diversity	$ 5,969	$ 5,931	$ 5,957	$ 5,974	$ 6,054
Inspector General	$ 45,507	$ 44,000	$ 44,000	$ 44,000	$ 44,000
Security and Safety Performance Assurance	$ 298,497	$ 293,595	$ 295,675	$ 295,675	$ 301,911
Environment, Safety and Health	$ 109,935	$ 107,634	$ 108,045	$ 107,666	$ 109,689
Cost of Work and Revenues	$ -69,318	$ -69,827	$ -69,470	$ -69,254	$ -68,186
Total Corporate Management	**$ 680,444**	**$ 669,305**	**$ 673,476**	**$ 674,097**	**$ 687,398**

FUNDING SCENARIO I - TARGET

As stated in the Departmental Strategic Plan, DOE's Strategic and General Goals will be accomplished not only through the efforts of the major program offices in the Department but with additional effort from offices which support the programs in carrying out the mission. DOE staff offices perform important functions that directly support the mission of the Department. The out-year funding profiles for the staff offices remain fairly level as DOE staff offices absorb inflation and pay raises.

DOE continues to do more with less by pursuing efficiency and effectiveness in the Department's internal business practices. Efforts include developing standardized and comprehensive processes, formulating clear and concise policies, instilling solid internal controls, and utilizing electronic government, competitive sourcing, strategic management of human capital, budget and performance integration, and the President's Management Agenda.

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

FUNDING SCENARIO II – ABOVE TARGET

($ in 000)	FY 2008	FY 2009	FY 2010	FY 2011
Corporate Management	Above Target Increment	Above Target Increment	Above Target Increment	Above Target Increment
Chief Information Officer	$ 4,504	$ 7,058	$ 9,886	$ 11,646
Management	$ 3,118	$ 3,199	$ 3,263	$ 3,336
Human Capital Management	$ 17,429	$ 15,446	$ 18,797	$ 22,620
General Counsel	$ 1,101	$ 1,813	$ 2,594	$ 3,140
Economic Impact and Diversity	$ 861	$ 865	$ 867	$ 879
Policy and International Affairs	$ 1,051	$ 1,930	$ 2,890	$ 3,686
Inspector General	$ 3,260	$ 4,484	$ 6,020	$ 7,084
Environment, Safety and Health	$ 3,585	$ 4,595	$ 6,383	$ 6,394
Total	$ 34,909	$ 39,390	$ 50,700	$ 58,785

The above target scenario for the corporate management offices represents the funding levels in the out-years that would provide enhanced support for high priority activities contained in the FY 2007 Congressional Budget request.

Highlights of major initiatives which drive the above target scenario are listed below:

- HUMAN CAPITAL MANAGEMENT- Development and implementation of the Strategic Management of Human Capital and Expanded Electronic Government Human Capital initiatives which directly support the President's Management Agenda. These initiatives will ensure that changing workforce requirements are accurately identified to permit effective workforce planning and eliminate critical skill gaps that may prevent the Department from achieving its mission. These initiatives will leverage the latest technologies to create an efficient corporate solution.

- CHIEF INFORMATION OFFICER - Implementation of the Office of Cyber Security's critical protection programs: Corporate Asset Management; Policy, Planning, and Awareness; and Incident Management and Compliance programs. These programs are designed to ensure that the Department's information and information systems remain secure against evolving threats and that the Department meets its statutory requirements of FISMA.

- ENVIRONMENT SAFETY AND HEALTH – Facilitation of increased focus on crosscutting safety functions for DOE and its stakeholders through the Corporate Safety subprogram, while maintaining the remaining activities such as RESL, ONSR and the Analytical Service Program at target levels.

- INSPECTOR GENERAL – Acquisition of personnel with specialized skill sets (e.g., Certified Public Accountants, Technology Crime Investigators, Certified Fraud Examiners) in order to

expertly address sophisticated departmental challenges. In order to retain highly qualified employees, the OIG would pay for certifications and credentials (consistent with the Inspector General community).

- MANAGEMENT – Filling the contract management skill gap that currently exists within the Department. This function has been identified by the Government Accountability Office as a high risk area. These additional FTEs (~10) would support part of a comprehensive strategy to improve our stature in this functional area.

Office of Nuclear Energy, Science and Technology (NE)
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

The Office of Nuclear Energy, Science and Technology (NE) leads the Government's efforts to develop new nuclear energy generation technologies to meet energy and climate goals, to develop advanced, proliferation-resistant nuclear fuel cycle technologies that maximize energy from nuclear fuel, and to maintain and enhance the national nuclear technology infrastructure. NE aims to serve the present and future energy needs of the Nation by managing the safe operation and maintenance of the DOE nuclear infrastructure that provides nuclear technology goods and services.

With respect to performance measures, the Office of Nuclear Energy is currently in the process of developing meaningful, measurable outcome-based performance metrics. Several of the performance measures presented below represent placeholders and will be revised in the near future.

Develop New Nuclear Generation Technologies

Mission and Program Goal

The mission of the Office of Nuclear Energy, Science and Technology is to lead the DOE investment in the development and exploration of advanced nuclear science and technology. NE leads the Government's efforts to develop new nuclear energy generation technologies; to develop advanced, proliferation-resistant nuclear fuel cycle technologies that maximize energy from nuclear fuel; and to maintain and enhance the national nuclear technology infrastructure.

To support this mission, NE works to develop new nuclear generation technologies that foster the diversity of the domestic energy supply through public-private partnerships that are aimed in the near-term (2015) at the deployment of advanced, proliferation-resistant light water reactor and fuel cycle technologies and in the longer-term (2025) at the development and deployment of next-generation advanced reactors and fuel cycles.

[1]Develop New Nuclear Generation Technologies Funding Plan

(dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007-2011)	246,124	372,147	351,542	347,422	338,904	344,026
Above Target (FY 2007-2011)	246,124	372,147	905,780	1,113,091	1,271,181	1,512,982

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

NE uses various means and strategies to achieve its program goals, including partnering with public and private organizations and conducting international cost-shared R&D activities in its key research areas. Collaborative activities with other organizations and countries contribute to achieving NE's goals. Under the target scenario, the NP 2010 program is funded using offsets from the Advanced Fuel Cycle Initiative program.

PRIORITIES:

Nuclear Power 2010

- Power companies make a decision to build a new nuclear power plant and establish plant construction contract in FY 2010.
  - Complete the Early Site Permit (ESP) Demonstration Projects, culminating with the issuance by the NRC of three ESPs.
  - Complete preparation and submittal of two combined Construction and Operating License (COL) applications to the Nuclear Regulatory Commission (NRC) with NRC-approved COLs expected to be issued to Dominion and NuStart in FY 2011.
  - Complete development of criteria under which the Department would accept and approve applications for agreements between the Department and project sponsors that will convert to standby support contracts once plant construction has commenced and other conditions are satisfied.

Advanced Fuel Cycle Initiative (AFCI)

- The Global Nuclear Energy Partnership will initiate construction of the UREX+ Engineering Scale Demonstration, while continuing conceptual design activities on two additional projects.
  - Design and initiate construction of the UREX+ Engineering Scale Demonstration (initial operation scheduled for about 2013-2015).
  - Continue conceptual design of the Advanced Fuel Cycle Facility (initial operation scheduled for about 2018-2020).
  - Continue conceptual design of a demonstration Advanced Burner Reactor (initial operation scheduled for about 2016-2018).
  - Pursue international cooperation and cost-share on GNEP demonstration projects and associated advanced separations and fuels development, particularly with France and Japan; complete commitment to France on fast reactor transmutation fuel irradiations in the Phenix reactor.
  - Evaluate data collected up until 2008 and use this information to help direct future GNEP activities.
  - Continue U.S. advanced fuel cycle research and development in support of GNEP.
  - Provide technical input to Secretarial recommendation on need for a second geologic repository.
  - Continue treatment of EBR-II reactor spent driver fuel using pyroprocessing.

Generation IV Energy Systems Initiative

- Address fundamental research and development issues necessary to establish the viability of next-generations nuclear energy system concepts.
  - Continue Next Generation Nuclear Plant research and development in reactor fuels, high temperature materials, analytic codes and methods, and collaborate with the U.S. Nuclear Regulatory Commission to develop a licensing strategy.
  - Continue participation in research and development activities on the Generation IV reactor concepts, particularly the Sodium Fast Reactor concept.
  - Continue monitoring of the Generation IV International Forum reactor concept research and development.

Nuclear Hydrogen Initiative

- Select most promising hydrogen production technologies in the 2011 pilot-plant decision.
  - Design, build and operate integrated laboratory-scale experiments for high-temperature thermochemical, electrolytic, and hybrid hydrogen production technologies to determine the feasibility and potential of each technology.
  - Characterize the operating conditions of each technology, including temperature input requirements, overall efficiency, capital cost, and materials lifetimes.
  - Develop supporting technologies to allow the broadest operational conditions, improve process operation, and overcome feasibility concerns for technologies demonstrated in the integrated laboratory-scale experiment.

Reallocations to Support NE Priorities:

Nuclear Power 2010

- This program is adequately funded thus there are no impacts.

Advanced Fuel Cycle Initiative

- AFCI R&D is focused on GNEP project support, with most lower priority, long-term R&D deferred.
- Delay completion of the GNEP demonstration phase by 2+ years. GNEP project funds are concentrated on the UREX+ Engineering Scale Demonstration.
- Reduce EBR-II spent driver fuel treatment to minimum necessary to complete work by 2035.

Generation IV Energy Systems Initiative

- This program is adequately funded thus there are no impacts.

Nuclear Hydrogen Initiative

- The program is adequately funded thus there are no impacts.

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.14.00.00 Develop New Nuclear Generation Technologies				
NP 2010				
Complete engineering and licensing demonstration activities necessary to implement the NP 2010 program in accordance with the principles of project management, to help ensure that program performance goals are achieved on schedule and within budget.	Submit two Construction and Operating License (COL) applications to the NRC.	Obtain NRC Final Design Approval for the Economic Simplified Boiling Water Reactor.	Complete the necessary COL project design finalization and risk analyses to support an industry decision to proceed with construction of a new nuclear power plant. Resolve outstanding regulatory issues to obtain first COL from the NRC. Issue design certification for the Economic Simplified Boiling Water Reactor.	Complete First-of-a-kind engineering for two standardized light water reactor designs.
Generation IV Energy Systems Initiative				
Complete Generation IV research and development plan to inform a design selection for the next generation nuclear power plant by FY 2011.	Issue reports on completion of Advanced Gas Reactor 1 (AGR-1) fuel specimen irradiation in the Advanced Test Reactor. Submit report to Congress on licensing strategy for Very-High-Temperature Reactor prepared jointly by DOE and NRC.	Complete assembly of the Advanced Gas Reactor 3 and 4 (AGR-3/4) fuel irradiation experiment for irradiation in the Advanced Test Reactor.	Approve NGNP Acquisition Strategy and prepare a request for proposals for a design competition for the NGNP Very-High-Temperature Reactor.	Issue reports on completion of Advanced Gas Reactor 3 and 4 (AGR-3/4) fuel specimen irradiation in the Advanced Test Reactor. Complete Phase One of the NGNP Complete NERAC review of NGNP Phase One Issue the NGNP Design Request for Proposals and make an award to not more than four design teams. Issue reports on completed graphite irradiation tests at high temperature.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
		Nuclear Hydrogen Initiative		
Complete NHI research and development activities that support the commercialization decision in 2015, as required in the Department's Hydrogen Posture Plan (a presidential initiative).	Begin testing of baseline thermochemical and high-temperature electrolysis integrated laboratory-scale experiments.	Begin optimization of baseline thermochemical and high-temperature electrolysis integrated laboratory-scale experiments.	Begin testing of promising alternative thermochemical cycle integrated laboratory-scale experiments.	Select technologies for pilot-scale hydrogen production experiments.
		Advanced Fuel Cycle Initiative		
Complete research and development activities that allow the AFCI program to support the Secretary of Energy's determination of the need for a second geologic repository for spent nuclear fuel by FY 2008.	Issue report on the completion of development and testing of a single-step purification and recovery process for transuranics. Initiate preliminary design of UREX+ Engineering Scale Demonstration.	Issue report on the completion of the Phenix fast reactor transmutation fuel irradiation tests. Complete preliminary design of UREX+ Engineering Scale Demonstration and issue report.	Initiate PIE on Phenix irradiation tests and issue report. Initiate construction of UREX+ Engineering Scale Demonstration.	Complete PIE on Phenix irradiation test advanced transmutation fuels and issue report. Continue construction of UREX+ Engineering Scale Demonstration.
		R&D Efficiency Measure		
Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

NE uses various means and strategies to achieve its program goals, including partnering with public and private organizations and conducting international cost-shared R&D activities in its key research areas. Collaborative activities with other organizations and countries contribute to achieving NE's goals. Above target assumes increases in FY 2008 through FY 2011 to support funding for the NP 2010 program and Global Nuclear Energy Partnership (GNEP) activities under the Advanced Fuel Cycle Initiative program.

PRIORITIES:

Nuclear Power 2010

- Power companies make a decision to build a new nuclear power plant and establish plant construction contract in FY 2010.
  - Complete the Early Site Permit (ESP) Demonstration Projects, culminating with the issuance by the NRC of three ESPs.
  - Complete preparation and submittal of two combined Construction and Operating License (COL) applications to the Nuclear Regulatory Commission (NRC) with NRC-approved COLs expected to be issued to Dominion and NuStart in FY 2011.
  - Complete development of criteria under which the Department would accept and approve applications for agreements between the Department and project sponsors that will convert to standby support contracts once plant construction has commenced and other conditions are satisfied.

Advanced Fuel Cycle Initiative

- The Global Nuclear Energy Partnership will complete construction and initiate operation of the UREX+ Engineering Scale Demonstration and will complete preliminary design activities on two additional projects.
  - Complete the design and construction and initiate operation of the UREX+ Engineering Scale Demonstration (initial operation scheduled for 2011).
  - Complete preliminary design and initiate final design of the first module of the Advanced Fuel Cycle Facility (initial operation scheduled for 2016).
  - Complete preliminary design of a demonstration Advanced Burner Reactor (initial operation scheduled for 2014).
  - Pursue international cooperation and cost-share on GNEP demonstration projects and associated advanced separations and fuels development, particularly with France and Japan; complete commitment to France on fast reactor transmutation fuel irradiations in the Phoenix reactor.
  - Evaluate data collected up until 2008 and use this information to help direct future GNEP activities.
  - Continue advanced fuel cycle R&D and other activities as discussed in the Target level priorities.

Generation IV Energy Systems Initiative

- Address fundamental research and development issues necessary to establish the viability of next-generations nuclear energy system concepts.
  - Continue Next Generation Nuclear Plant research and development in reactor fuels, high temperature materials, analytic codes and methods, and collaborate with the U.S. Nuclear Regulatory Commission to develop a licensing strategy.
  - Continued participation in research and development activities on the Generation IV reactor concepts, particularly the sodium Fast Reactor concept.
  - Continued monitoring of the Generation IV International Forum reactor concept research and development.

Nuclear Hydrogen Initiative

- Select most promising hydrogen production technologies in the 2011 pilot-plant decision.
  - Design, build and operate integrated laboratory-scale experiments for high-temperature thermochemical, electrolytic, and hybrid hydrogen production technologies to determine the feasibility and potential of each technology.
  - Characterize the operating conditions of each technology, including temperature input requirements, overall efficiency, capital cost, and materials lifetimes.
  - Develop supporting technologies to allow the broadest operational conditions, improve process operation, and overcome feasibility concerns for technologies demonstrated in the integrated laboratory-scale experiment.

Reallocations to Support NE Priorities:

Nuclear Power 2010

- This program is adequately funded thus there are no impacts.

Advanced Fuel Cycle Initiative

- AFCI R&D is focused on GNEP project support, with most lower priority, long-term R&D deferred.
- EBR-II driver fuel processing rate is reduced in order to provide more funds for GNEP-related activities while still completing work by 2035.

Generation IV Energy Systems Initiative

- Allows Generation IV R&D to continue forward, including international support on Sodium Fast Reactor research and development activities.

Nuclear Hydrogen Initiative

- This program is adequately funded and thus there are no impacts. Additional funding would be used to help support work that may increase the flexibility of operating conditions.

Performance Targets (Funding Scenario II – Above Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.14.00.00 Develop New Nuclear Generation Technologies				
NP 2010				
Complete engineering and licensing demonstration activities necessary to implement the NP 2010 program in accordance with the principles of project management, to help ensure that program performance goals are achieved on schedule and within budget.	Submit two Construction and Operating License (COL) applications to the NRC.	Obtain NRC Final Design Approval for the Economic Simplified Boiling Water Reactor.	Complete the necessary COL project design finalization and risk analyses to support an industry decision to proceed with construction of a new nuclear power plant. Resolve outstanding regulatory issues to obtain first COL from the NRC. Issue design certification for the Economic Simplified Boiling Water Reactor.	Complete First-of-a-kind engineering for two standardized light water reactor designs.
Generation IV Energy Systems Initiative				
Complete Generation IV research and development plan to inform a design selection for the next generation nuclear power plant by FY 2011.	Issue reports on completion of Advanced Gas Reactor 1 (AGR-1) fuel specimen irradiation in the Advanced Test Reactor. Submit report to Congress on licensing strategy for Very-High-Temperature Reactor prepared jointly by DOE and NRC.	Complete assembly of the Advanced Gas Reactor 3 and 4 (AGR-3/4) fuel irradiation experiment for irradiation in the Advanced Test Reactor.	Approve NGNP Acquisition Strategy and prepare a request for proposals for a design competition for the NGNP Very-High-Temperature Reactor.	Issue reports on completion of Advanced Gas Reactor 3 and 4 (AGR-3/4) fuel specimen irradiation in the Advanced Test Reactor. Complete Phase One of the NGNP Complete NERAC review of NGNP Phase One Issue the NGNP Design Request for Proposals and make an award to not more than four design teams. Issue reports on completed graphite irradiation tests at high temperature.

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
		Nuclear Hydrogen Initiative		
Complete NHI research and development activities that support the commercialization decision in 2015, as required in the Department's Hydrogen Posture Plan (a presidential initiative).	Begin testing of baseline thermochemical and high-temperature electrolysis integrated laboratory-scale experiments.	Begin optimization of baseline thermochemical and high-temperature electrolysis integrated laboratory-scale experiments.	Begin testing of promising alternative thermochemical cycle integrated laboratory-scale experiments.	Select technologies for pilot-scale hydrogen production experiments.
		Advanced Fuel Cycle Initiative		
Complete research and development activities that allow the AFCI program to support the Secretary of Energy's determination of the need for a second geologic repository for spent nuclear fuel by FY 2008.	Issue report on the completion of development and testing of a single-step purification and recovery process for transuranics. Complete preliminary design of UREX+ Engineering Scale Demonstration and issue report. Initiate preliminary design of Advanced Fuel Cycle Facility.	Issue report on the completion of the Phenix fast reactor transmutation fuel irradiation tests. Begin construction of UREX+ Engineering Scale Demonstration. Complete preliminary design of Advanced Fuel Cycle Facility and issue report. Initiate preliminary design of a demonstration Advanced Burner Reactor.	Initiate PIE on Phenix irradiation tests and issue report. Complete construction of UREX+ Engineering Scale Demonstration.	Complete PIE on Phenix irradiation test advanced transmutation fuels and issue report. Commence startup operations of UREX+ Engineering Scale Demonstration. Complete final design of first module of Advanced Fuel Cycle Facility. Complete preliminary design of a demonstration Advanced Burner Reactor.
		R&D Efficiency Measure		
Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.	Maintain total administrative overhead costs in relation to total program costs of less than 8 percent.

Maintain and Enhance the National Nuclear Infrastructure

Mission and Goal

The mission of the Office of Nuclear Energy, Science and Technology is to lead the DOE investment in the development and exploration of advanced nuclear science and technology. NE aims to serve the present and future energy needs of the Nation by managing the safe operation and maintenance of the DOE nuclear infrastructure that provides nuclear technology goods and services. NE manages research laboratories and radiological facilities and is the Lead Program Secretarial Officer for the Idaho National Laboratory.

To support this mission, NE works to maintain, enhance, and safeguard the Nation's nuclear infrastructure capability to help meet the Nation's energy, environmental, medical research, space exploration, and national security needs.

[1]Maintain and Enhance the National Nuclear Infrastructure Funding Plan

(dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I (Target)	289,536	260,551	261,227	262,945	264,187	266,993
Scenario II (Above Target)	289,536	260,551	324,149	315,317	320,528	324,992

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

To achieve this program goal, NE ensures that mission essential systems, resources, and services are identified, maintained, and operated in compliance with DOE, Federal, and State safety and environmental requirements in a secure and cost-effective manner. In addition, NE maintains isotope production facilities in a ready, safe and environmentally compliant condition and maintains the unique infrastructure and capability to deliver advanced radioisotope power systems for space and national security missions.

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

PRIORITIES:

Radiological Facilities Management

Space and Defense Infrastructure

- Maintain the Space and Defense infrastructure facilities at Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), and Oak Ridge National Laboratory ORNL) to meet existing high priority national security and space mission needs.

Medical Isotope Infrastructure

- Manage the planning, acquisition, operation, maintenance, and disposition of nuclear facilities and infrastructure to meet the demand for isotopes used in medicine, scientific research and homeland security.

- Operate isotope producing facilities located at Oak Ridge National Laboratory (ORNL), Brookhaven National Laboratory (BNL), and Los Alamos National Laboratory (LANL) to meet existing isotope needs.

Enrichment Facility Infrastructure

- Monitor Paducah GDP operation and maintenance baseline systems.
- Verify 10 percent of enrichment cells are being maintained in an operable condition.

Research Reactor Infrastructure

  - Maintain operability of university research reactors by providing for fuel fabrication for universities that have recurring fuel needs.
  - Schedule spent fuel shipments from universities to DOE storage locations on an as needed basis.
  - Order TRIGA fuel elements for universities that do not possess a lifetime fuel element.

Idaho Facilities Management

- Conduct minimum safe Base Operations for real property owned by the Office of Nuclear Energy, Science and Technology (NE) at the Idaho National Laboratory (INL).

- Conduct essential Routine Maintenance and Repair on nuclear and non-nuclear safety related and safety significant systems and components.

- Conduct the Advanced Test Reactor (ATR) Life Extension Program in accordance with planned program baseline.

Safeguards and Security

- Maintain the Safeguards and Security base program to meet the 2003 DBT. This includes the sub elements of a protective force, physical security systems, information security, personnel security, material control and accountability, program management and cyber security. Each of the sub elements is comprised of salaries, wages, benefits, materials, supplies, and equipment to execute specific activities.

- Increase security levels to begin to meet the 2005 DBT. This activity includes security system upgrades at various facilities and additional protective force personnel.

- Implement conversion of classified computer workstations to diskless requirements.

- Replace selected essential failed equipment.

Reallocations to Support NE Priorities:

Radiological Facilities Management

Space and Defense Infrastructure

- The Space and Defense infrastructure will have a decreasing capability to replace equipment or meet higher equipment maintenance costs resulting from the operation of obsolete equipment. Maintenance schedules will slip and maintenance backlogs will increase. This may increase the risk of not being able to meet customer needs.

- Some small reduction in infrastructure personnel may be required.

Medical Isotope Infrastructure

- Over the five year time frame, maintenance schedules for the medical isotope infrastructure would slip more than 15 percent and the maintenance backlog would increase. This may increase the possibility of interruptions in medical isotope production.

- Capital equipment upgrades required to support the infrastructure capability may be delayed.

Enrichment Facility Infrastructure

- Adequately funds monitoring of operations and maintenance baseline systems and includes activities to monitor systems in advance of plant shutdown in 2010.

Research Reactor Infrastructure

- No impacts

Idaho Facilities Management

- INL facilities and infrastructure Base Operations will be conducted as efficiently as possible to maximize support of programmatic goals while meeting environment, safety and health requirements.
- Minimum essential Routine Maintenance and Repair will be accomplished for nuclear and non-nuclear safety related and safety significant systems and components.

- The Routine Maintenance and Repair expenditure would be below the minimum 2% to 4% of Replacement Plant Value (RPV) guideline for Department of Energy (DOE) facilities.

- The Deferred Maintenance backlog will grow precluding the possibility of achieving a sustainable backlog of 5% RPV by 2010.

- The ATR Life Extension Program will be conducted in accordance with the program baseline.
- The ATR Gas Test Loop Line Item Construction Project (LICP) cannot be conducted.
- The Materials and Fuels Complex (MFC) Remote Treatment Project (RTP) LICP cannot be conducted.
- There will be limited conduct of the Idaho Facilities and Infrastructure Recapitalization Program (IFIRP) through General Plant Projects (GPP).
- There will be limited significant capital equipment purchases.
- The actual annual scope of work for Idaho Facilities Management will be reduced significantly from that established in the November 2005 INL Ten Year Site Plan (TYSP) that is required by the DOE Order 430.1B, *Real Property Asset Management*.

Safeguards and Security

- Plans will need to be revised and risks assessed to establish the best method of achieving partial implementation of 2005 DBT by FY 2008 deadline.
- Conversion of classified computer systems to diskless requirements cannot be implemented.
- Beginning in FY 2009 the base program will begin to be impacted. This will result in a reduction of equipment purchases. Vehicles will not be replaced, which may lead to mechanical failures and increased maintenance costs.
- By FY 2011, FTE reductions below FY 2010 staff levels would be required.

Performance Targets (Funding Scenario I – Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.17.00.00 Maintain and Enhance the National Nuclear Infrastructure				
Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.
Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.
N/A	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

Above Target assumes increases in FY 2008 through FY 2011 aimed at maintaining facility operations at an enhanced level from the FY 2007 request, and includes options for various upgrades to enhance the national nuclear infrastructure. In particular, Idaho Facilities Management is funded at a level that beings to minimally address identified maintenance and recapitalization requirements and deferred maintenance backups.

PRIORITIES:

Radiological Facilities Management

Space and Defense Infrastructure

- Maintain and operate the current Space and Defense Infrastructure at INL, LANL and ORNL to meet existing space and national security mission needs.

- Conduct limited enhancement of infrastructure equipment and capabilities to meet the changing needs of national security and space systems.

Medical Isotope Infrastructure

- Manage the planning, acquisition, operation, maintenance, and disposition of nuclear facilities and infrastructure to meet the demand for isotopes used in medicine, scientific research and homeland security.

- Operate isotope producing facilities located at Oak Ridge National Laboratory (ORNL), Brookhaven National Laboratory (BNL), and Los Alamos National Laboratory (LANL) to meet existing isotope needs.

- Invest in selected equipment replacements and upgrades to begin to address the anticipated growth in demand for isotopes.

Enrichment Facility Infrastructure

- Monitor Paducah GDP operation and maintenance systems baseline plus additional systems.
- Independently verify enrichment cells are being maintained in an operable condition.

Research Reactor Infrastructure

- Maintain operability of university research reactors by providing for fuel fabrication for universities that have recurring fuel needs.

- Schedule spent fuel shipments from universities to DOE storage locations on an as needed basis.
- Order TRIGA fuel elements for universities that do not possess a lifetime fuel element.

Idaho Facilities Management

- Conduct minimum safe Base Operations for real property owned by NE at the INL.
- Conduct essential Routine Maintenance and Repair on nuclear and non-nuclear safety related and safety significant systems and components.
- Conduct the ATR Life Extension Program in accordance with planned program baseline.
- Conduct the ATR Gas Test Loop Line Item Construction Project (LICP).
- Conduct the Material and Fuels Complex (MFC) Remote Treatment Project (RTP) LICP.
- Conduct Deferred Maintenance Reduction.
- Conduct IFIRP GPPs.
- Purchase Capital Equipment.

Safeguards and Security

- Maintain the Safeguards and Security Base program to meet the 2003 DBT. This includes the sub elements of a protective force, physical security systems, information security, personnel security, material control and accountability, program management and cyber security. Each of the sub elements is comprised of salaries, wages, benefits, materials, supplies, and equipment to execute specific activities.
- Increase security levels to possibly meet the 2005 DBT by 2011 through selected procurements.
- Implement conversion of classified computer workstations to diskless requirements.
- Upgrade and replace aged equipment.

Reallocations to Support NE Priorities:

Radiological Facilities Management

Space and Defense Infrastructure

- The Space and Defense infrastructure will selectively replace/update existing obsolete equipment and sufficient funds to maintain infrastructure personnel.

Medical Isotope Infrastructure

- Manage the planning, acquisition, operation, maintenance, and disposition of nuclear facilities and infrastructure to meet the existing demand for isotopes used in medicine, scientific research and homeland security and make upgrades in anticipation of demand growth.

- Operate isotope producing facilities located at Oak Ridge National Laboratory (ORNL), Brookhaven National Laboratory (BNL), and Los Alamos National Laboratory (LANL) to meet existing isotope needs.

- Invest in selected equipment replacements and upgrades to begin to address the anticipated growth in demand for isotopes.

Enrichment Facility Infrastructure

- Expand scope of independent verification and monitoring of operation and maintenance systems.

Research Reactor Infrastructure

- No impact

Idaho Facilities Management

- Conduct INL facilities and infrastructure Base Operations as efficiently as possible to maximize support of programmatic goals while meeting environment, safety and health requirements.

- Routine Maintenance and Repair would be accomplished in accordance with the "Budget Case" in the INL TYSP. However;

    - The Routine Maintenance and Repair expenditure would still remain below the minimum 2% to 4% of RPV guideline for DOE facilities.

- The ATR Life Extension Program would be conducted in accordance with the program baseline.

- The ATR Gas Test Loop LICP would be conducted in accordance with the planned baseline.

- MFC RTP LICP would be conducted on a revised, extended baseline.

- Limited Deferred Maintenance Reduction would be conducted.

- IFIRP GPPs would be conducted in accordance with the "Budget Case" in the INL TYSP.

- There would be capital equipment purchases in accordance with the "Budget Case" in the INL TYSP.

- The overall annual scope of work for Idaho Facilities Management would conform with the "Budget Case" scenario established in the November 2005 INL TYSP that is required by the DOE Order 430.1B, *Real Property Asset Management*.

Safeguards and Security

- Achieve partial implementation of 2005 DBT. Plans will need to be revised and risks assessed to establish the best method of achieving partial implementation of 2005 DBT by FY 2008 deadline.

- Conversion of classified computer systems to diskless requirements would be partially implemented.

- Aged equipment would be replaced in critical applications.

Performance Targets (Funding Scenario II – Above Target)

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 04.17.00.00 Maintain and Enhance the National Nuclear Infrastructure				
Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.	Consistent with safe operations, achieve cumulative variance of less than 10 percent from each of the cost and schedule baselines for the Radiological Facilities Management and Idaho Facilities Management programs.
Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.	Maintain operability of Radiological Facilities Management and Idaho Facilities Management-funded facilities to enable accomplishment of Nuclear Energy, other DOE and Work-for-Others milestones by achieving a Facility Operability Index of 0.9.
N/A	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.	Verify protection strategies through the use of quarterly force on force exercises as documented by the Federal Program Director.

Office of Science
Five Year Plan
FY 2007 – FY 2011

OVERVIEW:

"The Office of Science plays a critical role in ensuring America's scientific leadership and economic dynamism" [Opening Statement, Energy Secretary Samuel Bodman, House Committee on Science Hearing, February 15, 2006.]

The mission of the Science program is to deliver the discoveries and scientific tools that transform our understanding of energy and matter and advance the national, economic, and energy security of the United States.

The Science program funds energy related basic research in the following areas: fundamental research in energy, matter, and the basic forces of nature; health and environmental consequences of energy production and development; fundamental science that supports the foundations for new energy technologies and environmental mitigation; a science base for fusion as a potential future energy source; and advanced computational and networking tools critical to research. Office of Science (SC) participates in research on the President's initiatives in hydrogen, fusion energy, nanoscale science, information technology, and climate change science and technology.

In support of its mission, the Science program has responsibilities 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.

"Investment in these facilities is much more than bricks and mortar: it is an investment in discovery, and in the future of our nation." *Ibid*

American Competitiveness Initiative

In the President's State of the Union Address on January 31, 2006, President Bush stated,

> *We must continue to lead the world in human talent and creativity. Our greatest advantage in the world has always been our educated, hardworking, ambitious people—and we're going to keep that edge. Tonight I announce an American Competitiveness Initiative, to encourage innovation throughout our economy, and to give our nation's children a firm grounding in math and science.*
>
> *I propose to double the federal commitment to the most critical basic research program in the physical sciences over the next ten years. This funding will support the work of America's most creative minds as they explore promising areas such as nanotechnology, supercomputing, and alternative energy sources.*

"This reflects the President's commitment to double the federal investment in the most critical basic research programs in the physical sciences over the next ten years. Developing revolutionary, science-driven technology is at the heart of the Department of Energy's mission. And to ensure that America remains at the forefront in an increasingly competitive world, our Department is pursuing

transformational new technologies in the cutting-edge scientific fields of the 21st century—areas like nanotechnology, material science, biotechnology, and high-speed computing." Secretary Bodman, *Ibid*

The American Competitiveness Initiative recognizes that scientific discovery and understanding drive economic strength and security. Federal investment in research and development has proved critical to keeping America's economy strong by generating knowledge and tools upon which new technologies are developed. To ensure our continued leadership in the world, we are building on our record of results with new investments in the fields of physical sciences—advances in these areas will generate scientific and technological discoveries for decades to come. The FY 2007 Budget includes a $505 million increase for SC as part of the President's commitment to double, over 10 years, the sum of the research investment at SC, the National Science Foundation, and the Department of Commerce's National Institute of Standards and Technology. Although future individual agency allocations within the Initiative have yet to be determined, the funding profile for this five-year plan reflects a default assumption that the SC budget would double in size by FY 2016. Since the Administration determines the details of its appropriations request one year at a time, the budget allocations shown in the tables that follow represent placeholders, pending decisions in the future years.

[1]Five Year Plan—Funding Summary

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
Basic Energy Sciences	1,134,557	1,420,980	1,469,000	1,576,000	1,678,000	1,826,000
Advanced Scientific Computing Research	234,684	318,654	350,000	370,000	385,000	405,000
Biological and Environmental Research	579,831	510,263	526,000	551,000	609,000	638,000
High Energy Physics	716,694	775,099	785,000	810,000	890,000	975,000
Nuclear Physics	367,034	454,060	470,000	505,000	563,000	592,000
Fusion Energy Sciences	287,644	318,950	427,000	494,000	501,000	484,000
Other	275,947	303,704	339,000	341,000	321,000	345,000
Total, Office of Science	3,596,391	4,101,710	4,366,000	4,647,000	4,947,000	5,265,000

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

Basic Energy Sciences (BES)

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
User Facility Operations	450,926	651,690	699,222	768,765	803,329	853,612
Construction	176,292	148,269	108,822	124,000	140,000	175,000
Research	507,339	621,021	660,956	683,235	734,671	797,388
Total, BES	1,134,557	1,420,980	1,469,000	1,576,000	1,678,000	1,826,000

PRIORITIES:

User Facility Operations

- The Spallation Neutron Source (SNS) begins initial operations in FY 2006. When it reaches full power operations in FY 2008, the SNS will be significantly more powerful (by about a factor of 10) than the best spallation neutron source now in existence—ISIS at the Rutherford Laboratory in England. It is estimated that SNS will be used by 1,000–2,000 scientists and engineers annually for research in broad classes of experiments that cannot be done with today's low flux sources.
- Planned funding for other BES user facilities (four light sources, five Nanoscale Science Research Centers (NSRCs) in FY 2008 and beyond, the High Flux Isotope Reactor, and the Combustion Research Facility) is at optimal levels of operations in FY 2007 through FY 2011.
- BES began partial funding of the Stanford Linear Accelerator Center (SLAC) linac in FY 2006 for the Linac Coherent Light Source (LCLS) project. Transition of SLAC linac operations from the High Energy Physics program to BES will occur incrementally until BES supports all SLAC linac operations in FY 2009.

Construction

- A critical component of SC's contribution to the National Nanotechnology Initiative is the construction and operation of NSRCs. Four centers are finished by FY 2007. NSRCs are user facilities for the synthesis, processing, fabrication, and analysis of materials at the nanoscale, and the fifth center will be complete in FY 2008. They are designed to contribute to the nanoscale revolution by collocating multiple research disciplines, multiple techniques, and a wide variety of state-of-the-art instrumentation.
- The LCLS project will provide laser-like radiation in the x-ray region of the spectrum that is 10 billion times greater in peak power and peak brightness than any existing coherent x-ray light source, with pulse lengths of femtoseconds—the timescale of atomic motion. Beginning in FY 2006, SC supports construction of the LCLS, including the necessary SLAC infrastructure, with operations planned to begin in FY 2009.

- The National Synchrotron Light Source II (NSLS-II), a planned replacement of the current NSLS at the Brookhaven National Laboratory, would be the most highly optimized storage ring synchrotron in the world. Formal design begins in FY 2007. Construction starts in FY 2009 and continues through the rest of the 5-year period with initial operations tentatively slated for 2014. Due to improved brightness, flux, and stability, the NSLS-II will deliver an order of magnitude improvement in spatial resolution over any other facility worldwide—whether currently operating, in construction, or in design—enabling the study of materials with 1 nanometer spatial resolution and with 0.1 millielectron volt energy resolution. These beam parameters will provide the world's finest capabilities for x-ray imaging, and, for the first time, it will be possible to do direct x-ray imaging of materials at the nanometer scale.
- Design of a User Support Building for the Advanced Light Source (ALS) begins in FY 2007 to accommodate the very rapid growth in the number of ALS users and to accommodate projected future expansion, with construction completed in FY 2009.
- An additional instrument fabrication project for the SNS would complete nineteen of the full suite of twenty-four beam lines for the target station at the SNS.
- An additional instrument fabrication project for the LCLS would address all of the science thrust areas in the LCLS First Experiments report except for high-energy-density physics.

Research

- New research thrusts initiated in FY 2007 are continued through the planning window to further DOE mission needs in the following six new areas: effective solar energy utilization; advanced nuclear energy systems; ultrafast science; chemical imaging; complex systems or emergent behavior; and mid-scale instrumentation.
- There are significant increases in BES nanoscale science and engineering research activities in support of the National Nanotechnology Initiative (NNI). In addition to the operations of the Nanoscale Science Research Centers, funding for research at the nanoscale increases very significantly owing to new funding for activities related to the hydrogen economy, solar energy conversion, advanced nuclear energy systems, fundamental studies of materials at the nanoscale, and instrumentation for characterizing materials at the nanoscale. BES NNI funding increases 66% by FY 2011 over the FY 2006 level.
- The basic research component of the Hydrogen Fuel Initiative (HFI) continues to increase throughout the SC planning horizon. BES HFI funding increases 115% by FY 2011 over the FY 2006 level. The basic research efforts continue to target critical scientific and technical hurdles in hydrogen production, storage, and distribution aimed at the long-term viability of a future hydrogen economy.
- All BES research programs are maintained at an approximately constant effort with the FY 2007 level.

Reallocations to Support SC Priorities:

User Facility Operations

- In FY 2007, support for continued operations of the Intense Pulsed Neutron Source and the Manuel Lujan Jr. Neutron Scattering Center will be evaluated following the commissioning and

first year of operation of the Spallation Neutron Source. It is anticipated that one or both of the smaller facilities will be phased out during the five-year planning period.

BASIC ENERGY SCIENCES

Performance Targets

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Program Goal 5.22.00.00 Advance the Basic Science for Energy Independence				
Materials Sciences and Engineering				
Improve Spatial Resolution: Demonstrate measurement of spatial resolutions for imaging in the hard x-ray region of <100 nm (nanometers) and in the soft x-ray region of <18 nm, and spatial information limit for an electron microscope of 0.08 nm.[1]	Improve Spatial Resolution: Demonstrate measurement of spatial resolutions for imaging in the hard x-ray region of <100 nm and in the soft x-ray region of <18 nm, and spatial information limit for an electron microscope of 0.08 nm.[1]	Improve Spatial Resolution: Demonstrate measurement of spatial resolutions for imaging in the hard x-ray region of <100 nm and in the soft x-ray region of <18 nm, and spatial information limit for an electron microscope of 0.08 nm.[1]	Improve Spatial Resolution: Demonstrate measurement of spatial resolutions for imaging in the hard x-ray region of <100 nm and in the soft x-ray region of <18 nm, and spatial information limit for an electron microscope of 0.08 nm.[1]	Improve Spatial Resolution: Demonstrate measurement of spatial resolutions for imaging in the hard x-ray region of <100 nm and in the soft x-ray region of <18 nm, and spatial information limit for an electron microscope of 0.08 nm.[1]
Improve Temporal Resolution: Demonstrate measurement of x-ray pulses that are <100 femtoseconds in duration and have an intensity of >100 million photons per pulse ($>10^8$ photons/pulse).[1]	Improve Temporal Resolution: Demonstrate measurement of x-ray pulses that are <100 femtoseconds in duration and have an intensity of >100 million photons per pulse ($>10^8$ photons/pulse).[1]	Improve Temporal Resolution: Demonstrate measurement of x-ray pulses that are <100 femtoseconds in duration and have an intensity of >100 million photons per pulse ($>10^8$ photons/pulse).[1]	Improve Temporal Resolution: Demonstrate measurement of x-ray pulses that are <100 femtoseconds in duration and have an intensity of >100 million photons per pulse ($>10^8$ photons/pulse).[1]	Improve temporal resolution: Demonstrate measurement of x-ray pulses that are <100 femtoseconds in duration and have an intensity of >100 million photons per pulse ($>10^8$ photons/pulse).[1]
Chemical Sciences, Geosciences, and Energy Biosciences				
Improve Simulation: Beginning in FY 2007, increasing the size of the simulation will no longer provide useful new information. Thus, this measure is being discontinued.				
Materials Sciences and Engineering				
Maintain and operate the scientific user facilities to achieve an average at least 90% of the total scheduled operating time.	Maintain and operate the scientific user facilities to achieve an average at least 90% of the total scheduled operating time.	Maintain and operate the scientific user facilities to achieve an average at least 90% of the total scheduled operating time.	Maintain and operate the scientific user facilities to achieve an average at least 90% of the total scheduled operating time.	Maintain and operate the scientific user facilities to achieve an average at least 90% of the total scheduled operating time.
Construction				
Meet the cost and timetables within 10% of the baselines given in the construction project data sheets for all ongoing construction projects.	Meet the cost and timetables within 10% of the baselines given in the construction project data sheets for all ongoing construction projects.	Meet the cost and timetables within 10% of the baselines given in the construction project data sheets for all ongoing construction projects.	Meet the cost and timetables within 10% of the baselines given in the construction project data sheets for all ongoing construction projects.	Meet the cost and timetables within 10% of the baselines given in the construction project data sheets for all ongoing construction projects.

1 No further improvement is expected in FY 2006–FY 2011 as compared to the level of achievement for FY 2005. Performance levels for resolution (temporal and spatial) have reached the maximum for the current suite of available instruments. This target is a measure of SC's intent to maintain the maximum level of performance for users of the current SC facilities until the next generation of instruments and facilities becomes available.

Advanced Scientific Computing Research (ASCR)

B/A (Dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
User Facility Operations	91,191	157,294	164,790	169,790	174,790	185,000
Research	143,493	161,360	185,210	200,210	210,210	220,000
Total, ASCR	234,684	318,654	350,000	370,000	385,000	405,000

PRIORITIES:

User Facility Operations

- The Oak Ridge Leadership Computing Facility (LCF) provides high performance sustained capability to researchers based on peer review. Computers acquired in FY 2004 and FY 2005 are upgraded to provide more than 250 teraflops peak capability by the end of FY 2007, placing the Oak Ridge LCF on a path to provide over 1,000 teraflops by the end of FY 2008.
- An IBM Blue Gene P high-performance computer system with low-electrical power requirements was an important element of the joint Oak Ridge, Argonne, and Pacific Northwest National Laboratories' proposal for a Leadership Class Computing Facility that was selected in 2004. The 100 teraflop system to be acquired by the Argonne National Laboratory (ANL) in FY 2007, creating the Argonne Leadership Computing Facility, is planned to be increased to a capability in the range of 250–500 teraflops by the end of FY 2008.
- The National Energy Research Scientific Computing Center (NERSC) is upgraded to a peak capacity in the range of 100–150 teraflops by the end of FY 2007 to alleviate the current backlog of meritorious requests for high-performance production computing resources. Another upgrade of NERSC to 500 teraflops peak capacity, planned for the end of the decade, ensures that SC's high-performance production computing needs continue to be met into the next decade.
- Energy Science Network (ESnet) evolves over the 5 year period to dual backbone rings at 40 gigabits per second with fault tolerant 10 gigabit per second connections to most major SC laboratories and higher bandwidth connections to NERSC, the Oak Ridge and Argonne LCFs, and other sites with exceptional data requirements, such as Fermilab.

Research

- Research efforts in applied mathematics and computer science are focused and strengthened to deliver the operating systems, programming models, software tools, and mathematical algorithms and libraries needed for scientists to make effective use of Leadership Class Computing and high-performance production computing resources.
- In FY2008 and beyond, software efforts will ramp-up to deliver operating systems, file systems and knowledge extraction software required by petascale computers that result from the Defense Advanced Research Projects Administration (DARPA) High Productivity Computing Systems (HPCS) program partnership.

- The Scientific Discovery through Accelerated Computing (SciDAC) program, based on peer review, strengthens activities at the software centers initiated in FY 2006. In addition, SciDAC initiates research investments in applied mathematics and computer science to accelerate efforts in modeling and simulation on Leadership Class Computing resources in specified high-priority application areas.
- The Research and Evaluation Prototype computers effort will be coordinated with the National Nuclear Security Administration (NNSA) and focused on the Defense Advanced Research Projects Administration (DARPA) High Productivity Computing Systems (HPCS) program partnership.
- As a result of the activities described above, users will be prepared for the introduction of next generations of scientific computers and the overall risk associated with future computer system acquisitions will be reduced.

Reallocations to Support SC Priorities:

Research

Basic research investments that do not directly contribute to the effective use of Leadership Class computing and high-performance production computing resources will be de-emphasized.

- The Research and Evaluation prototype activity is being redirected to support the DOE partnership with the DARPA High Productivity Computing Systems (HPCS) program.
- Network research activities will be focused on evaluating the feasibility of sharing file systems and archival systems between leadership computing sites.
- SciDAC is being refocused, as a result of a recompetition in FY2006, to develop petascale applications and the supporting software infrastructure.

ADVANCED SCIENTIFIC COMPUTING RESEARCH

Performance Targets

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Program Goal 05.23.00.00 Deliver forefront computational and networking capabilities				
Mathematical, Information and Computational Sciences				
Improve Computational Science Capabilities. Average annual percentage increase in the computational effectiveness (either by simulating the same problem in less time or simulating a larger problem in the same time) of a subset of application codes within the SciDAC effort. FY 2007— >50%	Improve Computational Science Capabilities. Average annual percentage increase in the computational effectiveness (either by simulating the same problem in less time or simulating a larger problem in the same time) of a subset of application codes within the SciDAC effort. FY 2008— >50%	Improve Computational Science Capabilities. Average annual percentage increase in the computational effectiveness (either by simulating the same problem in less time or simulating a larger problem in the same time) of a subset of application codes within the SciDAC effort. FY 2009— >50%	Improve Computational Science Capabilities. Average annual percentage increase in the computational effectiveness (either by simulating the same problem in less time or simulating a larger problem in the same time) of a subset of application codes within the SciDAC effort. FY 2010— >50%	Improve Computational Science Capabilities. Average annual percentage increase in the computational effectiveness (either by simulating the same problem in less time or simulating a larger problem in the same time) of a subset of application codes within the SciDAC effort. FY 2011—>50%
Focus usage of the primary supercomputer at the NERSC on capability computing. Percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource. FY 2007— 40%	Focus usage of the primary supercomputer at the NERSC on capability computing. Percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource. FY 2008— 40%	Focus usage of the primary supercomputer at the NERSC on capability computing. Percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource. FY 2009— 40%	Focus usage of the primary supercomputer at the NERSC on capability computing. Percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource. FY 2010— 40%	Focus usage of the primary supercomputer at the NERSC on capability computing. Percentage of the computing time used that is accounted for by computations that require at least 1/8 of the total resource. FY 2011— 40%

Biological and Environmental Research (BER)

	B/A (dollars in thousands)					
	FY 2006 Approp.	FY 2007 Request	FY2008	FY2009	FY2010	FY2011
User Facility Operations	122,965	136,063	129,591	156,508	221,195	228,489
Construction (TEC).....	—	—	42,000	30,000	—	—
Research (including Congressionally directed projects).....	456,866					
Research (excluding Congressionally directed projects).....	(328,166)	374,200	354,409	364,492	387,805	409,511
Total BER	579,831	510,263	526,000	551,000	609,000	638,000

PRIORITIES:

User Facility Operations

- The Joint Genome Institute/Production Genomics Facility (JGI/PGF) operates at full capacity supporting merit based Deoxyribonucleic Acid (DNA) sequencing open to all scientists to address DOE and national mission needs. The Atmospheric Radiation Measurement (ARM) facilities operate at full capacity with an additional ARM mobile facility added for increasing observations in key climate regions that are under-observed. Structural biology user facilities operate at full capacity.
- The Environmental Molecular Sciences Laboratory (EMSL) budget is increased to maintain operations at optimal capacity and to accelerate the replacement and refurbishment of user instrumentation.

Construction

- Design and construction funds for Genomics: GTL facilities are included within the planning window. The Department is currently in the process of reviewing its plans for these facilities based on the recommendations of a recent National Academies report.

Research

- GTL research is increased to implement an accelerated program of microbe-based biotechnology in support of the Administration's Advanced Energy Initiative for production of ethanol from cellulose and for generation of hydrogen, bioremediation, and sequestration of carbon dioxide. The program includes multiple research paths to maximize opportunities for success and to optimize systems design options. The additional funds would be used to ensure that focused research investments are made across the range of parallel GTL program scientific and technical needs, including computing/information, high-throughput proteomics and analysis of molecular

machines, synthetic genome development, microbial community analytic capabilities, etc. Finally, this accelerated research effort will be coordinated across DOE programs (both within and outside SC), across federal agencies (including the Department of Agriculture, National Science Foundation (NSF), and National Institutes of Health), and across DOE laboratories, academia, industry, and nongovernmental organizations. Increased SciDAC research supports development of mathematical and computational tools needed for complex biological system modeling; analysis of complex data sets, such as mass spectrometry; and development of predictive models of complex microbial communities.

- New carbon sequestration research continues on microbial processes that affect carbon transformation/sequestration in soils using technologies and methods developed by GTL. Structural Biology infrastructure and innovative research on the biological effects of low dose radiation needed for future radiation protection standards is sustained. Ethical/societal issues research on bio- and nano-technology will continue to be coordinated across SC.
- Climate Change Research continues to support the Administration's Climate Change Science and Technology Programs, providing data to develop, test, and improve climate models to simulate and predict responses of climate to increased atmospheric carbon dioxide and aerosols and deliver predictions at regional scales. SciDAC research continues to develop mathematical and computational tools needed for climate modeling. Climate modeling research continues to advance climate models by building cloud system resolving models and including the effect of sulfate aerosols on climate, giving scientists better decadal and centennial scale climate simulations for predicting regional climate.
- Environmental Remediation Research continues to address fundamental questions at the interfaces of biology, chemistry, geology and physics for science-based solutions to DOE clean-up needs at molecular to field scales. Planned increases support additional field research sites to speed transfer of laboratory results to diverse DOE environments enabling scientists to understand, compare, and contrast different contaminated DOE sites whose contaminated subsurface environments differ widely with respect to their biological, geological, hydrological, and chemical characteristics. Increased funding for SciDAC would provide an opportunity for subsurface and computational scientists to develop and improve methods for simulating subsurface reactive transport processes on "discovery class" computers. The intent is to explore potential advantages that high-end computing can bring to the understanding of optimal model complexity, the scalability of biogeochemical reactions, model abstraction methods, sources of uncertainty, parameter estimation, and characterization measurements as input in subsurface reactive transport modeling.
- Within the context of the larger interagency effort, the Medical Sciences research program will likely continue to support radiopharmaceutical computational, and instrument development for more precise localization of radiotracers, as well as radiochemist training programs for nuclear medicine research. SC support for the artificial retina activity will be phased out upon the submission of a human study application to the Food and Drug Administration in FY 2009.

Reallocations to Support SC Priorities:

User Facility Operations

- Support for Free Air Carbon Dioxide Enrichment (FACE) facilities is no longer distinguished from research costs beginning in FY 2008 to fund new FACE-type experiments as part of competitive research awards.
- Support for the mouse facility is progressively reduced during the planning window as support for genomics research transitions from human to biological systems important for DOE's energy and environmental needs. Necessary low dose research at the Mouse Facility continues.

Research

- Funding for some Genomics: GTL technology development activities will be redirected toward building GTL facilities and centers as appropriate.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

Performance Targets

FY 2007 Targets	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Program Goal 05.21.00.00 (Harness the Power of Our Living World)				
Life Sciences				
Increase the rate and decrease the cost of DNA sequencing—Cost reductions will increase the number of high quality base pairs determined (less than one error in 10,000 bases) by 25% from the FY 2006 target of 582 base pairs per dollar to 781 base pairs per dollar.	Increase the rate and decrease the cost of DNA sequencing—Cost reductions will increase the number of high quality base pairs determined (less than one error in 10,000 bases) by 44% to 1,128 base pairs per dollar..	Increase the rate and decrease the cost of DNA sequencing—Cost reductions will increase the number of high quality base pairs determined (less than one error in 10,000 bases) by 20% to 1,354 base pairs per dollar..	Increase the rate and decrease the cost of DNA sequencing—Cost reductions will increase the number of high quality base pairs determined (less than one error in 10,000 bases) by 20% to 1,624 base pairs per dollar.	Increase the rate and decrease the cost of DNA sequencing—Cost reductions will increase the number of high quality base pairs determined (less than one error in 10,000 bases) by 20% to 1,949 base pairs per dollar.
Climate Change Research				
Provide new mixed-phase cloud parameterization for incorporation in atmospheric GCMs and evaluate extent of agreement between climate model simulations and observations for cloud properties in the arctic.	Report results of decade-long control simulation using geodesic grid coupled climate model and produce new continuous time series of retrieved cloud, aerosol, and dust properties, based on results from the AMF deployment in Niger, Africa.	Provide improved climate simulations on subcontinental, regional, and large watershed scales, with an emphasis on improved simulation of precipitation and produce new continuous time series of retrieved cloud, aerosol, and radiation for Arctic region.	Complete development and testing of atmospheric GCM with interactive atmospheric chemistry and aerosols and produce improved model parameterizations of land surface and cloud interactions.	Complete coupled earth system model to be used in generating scenarios for the IPCC Fifth Assessment Report and provide integrated aerosol sub-model that includes direct and indirect forcing.
Environmental Remediation				
Implement a field-oriented, integrated experimental research program to quantify coupled processes that control reactive transport of at least one key DOE contaminant.	Identify the critical redox reactions and metabolic pathways involved in the transformation/ sequestration of at least one key DOE contaminant in a field environment.	Test geophysical techniques that measure parameters controlling contaminant movement under field conditions in at least two distinct subsurface environments.	Evaluate contaminant transport model in the context of field results and initiate revisions to model.	Conduct subsurface field studies to test predictions from previously developed models.
Medical Applications and Measurement Science[1]				
Advanced blind patient sight: complete design and construction of final 256 electrode array. Begin *in vitro* testing and non-stimulating testing in animals.	Advance blind patient sight: Complete *in vitro* testing of 256 electrode array and continue animal studies of final design 256 electrode array.	Advance blind patient sight: Complete *in vitro* and *in vivo* studies of final design 256 electrode device. Submit test data to FDA for approval of 256 electrode array for human studies.		

1 This is not a PART measure.

FY 2007 Targets	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
All BER Facilities				
Maintain and operate BER facilities (Life Science—PGF and the Mouse facility; Climate Change Research—ARM and FACE; and Environmental Remediation—EMSL) such that achieved operation time is on average greater than 98% of the total scheduled annual operation time for each group of facilities.	Maintain and operate BER facilities (Life Science—PGF; Climate Change Research—ARM; and Environmental Remediation—EMSL) such that achieved operation time is on average greater than 98% of the total scheduled annual operation time for each group of facilities.[1]	Maintain and operate BER facilities (Life Science—PGF; Climate Change Research—ARM; and Environmental Remediation—EMSL) such that achieved operation time is on average greater than 98% of the total scheduled annual operation time for each group of facilities.	Maintain and operate BER facilities (Life Science—PGF; Climate Change Research—ARM; and Environmental Remediation—EMSL) such that achieved operation time is on average greater than 98% of the total scheduled annual operation time for each group of facilities.	Maintain and operate BER facilities (Life Science—PGF; Climate Change Research—ARM; and Environmental Remediation—EMSL) such that achieved operation time is on average greater than 98% of the total scheduled annual operation time for each group of facilities.

1 Note the Mouse Facility and the FACE facility are discontinued as user facilities in FY 2008.

High Energy Physics (HEP)

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
User Facility Operations	309,139	308,647	277,000	241,400	215,000	215,000
Construction	——	10,300	18,900	51,200	43,500	26,100
Research	407,555	456,152	489,100	517,400	631,500	733,900
Total, HEP	716,694	775,099	785,000	810,000	890,000	975,000

PRIORITIES:

User Facility Operations

- To fulfill its mission to address the fundamental questions of how the universe works, by discovering the most elementary constituents of matter and energy, and exploring the basic nature of space and time itself, HEP supports Tevatron collider and Neutrinos at the Main Injector (NuMI) operations at Fermilab, and B-factory operations at the Stanford Linear Accelerator Center (SLAC) through FY 2008.

Construction

- Measuring the neutrino's properties may provide a key to unlocking the secret of why such a large variety of elementary particles exist, and why there is such a stark imbalance of matter over antimatter in the universe. The recently completed NuMI neutrino beam at Fermilab is the world's most prolific source of accelerator neutrinos: a vigorous research program is planned to fully exploit our investment in this facility. HEP plans support for construction of new facilities and experiments to further extend our knowledge of neutrinos, beginning with project engineering and design in FY 2007 for an Electron Neutrino Appearance (EvA) experiment that utilizes the NuMI beam, with construction complete by FY 2011.
- HEP supports the proposed space-based Joint Dark Energy Mission (JDEM), in cooperation with the National Aeronautics and Space Administration (NASA), to determine the nature of the mysterious dark energy which is pushing the universe apart. Dark energy makes up over two-thirds of the energy content of the universe and its nature is one of the outstanding unanswered questions in physics. Following a near-term coordinated competition, fabrication of the experiment chosen for JDEM could begin near the end of the planning horizon.
- The proposed International Linear Collider (ILC)—HEP's highest priority—is expected to provide a far deeper understanding of the unification of forces, the origin of mass, and the character of the dark matter pervading the universe. Its precision would allow a much sharper understanding of discoveries made at the Large Hadron Collider (LHC), now under construction at CERN. The Department has expressed its interest in siting the ILC at Fermilab should it be built and the United States be chosen as the host country. The outyear profile includes support for technology R&D activities aimed at various technical design goals while reducing project

risk and cost to support an international decision-making process near the end of this decade. A future decision to proceed with construction rests on two conditions: the ILC is deemed a priority and affordable by its international partners; and the anticipated new science at the ILC is supported by clear physics results at the LHC.

Research

The HEP program has prioritized its planned future efforts to select those which will provide the most compelling science opportunities in the coming decade, and those where we can establish a U.S. leadership role by developing and constructing new cutting edge scientific facilities.

- The centerpiece of world-wide HEP research in the next decade will be the LHC, which is expected to begin physics operations in FY 2008. U.S. researchers will take leading roles in LHC discoveries.
- Neutrino Physics—In parallel with the construction of new facilities, the HEP program supports a ramp-up of research and development (R&D) efforts that are expected to lead to fabrication of new experiments and proposals for new facilities which can address the important questions in this research area. This includes a reactor-based neutrino detector which begins fabrication in FY 2007, and a joint experiment with Nuclear Physics (and perhaps the NSF) to measure the absolute mass of the neutrino.
- Dark Energy—HEP continues support of R&D activities for several concepts for a space-based Joint Dark Energy Mission with NASA, including the Supernova/Acceleration Probe (SNAP) mission concept. Because of the scientific advisability of pursuing alternative methods and techniques in this fast-developing area of research, HEP may also support R&D for ground-based dark energy experiments (such as new telescopes or cameras on existing telescopes), in collaboration with the NSF.

Reallocations to Support SC Priorities:

User Facility Operations

- Operations of the SLAC B-factory are to be completed by FY 2008. The impact at the laboratory is offset by BES support for LCLS construction and operations, and ILC R&D activities.
- Operations of the Fermilab Tevatron Collider and its two major experiments (CDF and D-Zero) complete during the planning horizon and Fermilab's primary focus in operations then transitions to a world-leading neutrino program.

Research

- Research activities in the HEP program are redirected as the B-factory and Tevatron Run II research programs conclude and new research programs (at LHC and NuMI) ramp-up and R&D activities for future projects (such as ILC, dark energy, and neutrino experiments) expand.

HIGH ENERGY PHYSICS

Performance Targets

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Program Goal 05.19.00.00 (Explore the Fundamental Interactions of Energy, Matter, Time and Space)				
All HEP Facilities				
Maintain and operate HEP facilities such that unscheduled downtime is on average less than 20% of the total scheduled operating time.	Maintain and operate HEP facilities such that unscheduled downtime is on average less than 20% of the total scheduled operating time.	Maintain and operate HEP facilities such that unscheduled downtime is on average less than 20% of the total scheduled operating time.	Maintain and operate HEP facilities such that unscheduled downtime is on average less than 20% of the total scheduled operating time.	Maintain and operate HEP facilities such that unscheduled downtime is on average less than 20% of the total scheduled operating time.
Proton Accelerator-Based Physics/Facilities				
Deliver data as planned within 20% of the baseline estimate (800 pb^{-1} [inverse picobarns]) to CDF and D-Zero detectors at the Tevatron.	Deliver data as planned within 20% of the baseline estimate (1,000 pb^{-1}) to CDF and D-Zero detectors at the Tevatron.	Deliver data as planned within 20% of the baseline estimate (1,000 pb^{-1}) to CDF and D-Zero detectors at the Tevatron.		
Deliver data as planned within 20% of the baseline estimate ($1.5x10^{20}$ protons on target) for the MINOS experiment using the NuMI facility.[a]	Deliver data as planned within 20% of the baseline estimate ($2x10^{20}$ protons on target) for the MINOS experiment using the NuMI facility.	Deliver data as planned within 20% of the baseline estimate ($2x10^{20}$ protons on target) for the MINOS experiment using the NuMI facility.	Deliver data as planned within 20% of the baseline estimate ($2x10^{20}$ protons on target) for the MINOS experiment using the NuMI facility.	Deliver data as planned within 20% of the baseline estimate ($2x10^{20}$ protons on target) for the EvA experiment using the NuMI facility.
Electron Accelerator-Based Physics/Facilities				
Deliver data as planned within 20% of the baseline estimate (150 fb^{-1} [inverse femtobarns]) to the BaBar detector at the SLAC B-factory.	Deliver data as planned within 20% of the baseline estimate (250 fb^{-1}) to the BaBar detector at the SLAC B-factory.			
Construction/Major Items of Equipment				
Maintain cost and schedule milestones for major items of equipment and new construction projects within 10% of baseline estimates.	Maintain cost and schedule milestones for major items of equipment and new major construction projects within 10% of baseline estimates.	Maintain cost and schedule milestones for major items of equipment and new major construction projects within 10% of baseline estimates.	Maintain cost and schedule milestones for major items of equipment and new major construction projects within 10% of baseline estimates.	Maintain cost and schedule milestones for major items of equipment and new major construction projects within 10% of baseline estimates.

Nuclear Physics (NP)

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
User Facility Operations	213,006	255,754	258,558	267,193	277,050	276,990
Construction	1,980	14,520	16,200	30,000	59,000	71,000
Research	152,048	183,786	195,242	207,807	226,950	244,010
Total, NP	367,034	454,060	470,000	505,000	563,000	592,000

PRIORITIES:

User Facility Operations

- The Relativistic Heavy Ion Beam Collider (RHIC) at the Brookhaven National Laboratory operates at near optimum levels to study new states of matter created with heavy ion beams that were not previously in existence since microseconds after the Big Bang. RHIC is also operated to study the spin structure of the proton with polarized proton beams. RHIC is the world's premier facility for these studies.
- The Continuous Electron Beam Accelerator Facility (CEBAF) at the Thomas Jefferson National Accelerator Facility provides beams for its planned experimental program while proceeding in parallel with the 12 GeV CEBAF Upgrade construction project. CEBAF is the world's leading facility for the study of the internal quark structure of the nucleon with electron beams.
- Important advances will be made in understanding energy production in stars, the formation of heavy elements, and explosive stellar events in nuclear structure and astrophysics studies at NP's low energy National User Facilities: the Argonne Tandem Linear Accelerator System (ATLAS) and the Oak Ridge Holifield Radioactive Ion Beam Facility (HRIBF). These facilities operate at near optimum levels and research capabilities are developed to mount forefront programs in the first part of the next decade with both stable and radioactive beams.

Construction

- Funding is provided during this period for construction of the 12 GeV CEBAF Upgrade project. This upgrade will double the energy of CEBAF and provide research capabilities for precision studies of the quark substructure of the nucleon and nuclei and the opportunity to learn about the mechanism of quark "confinement."
- A new pre-injector for RHIC, the Electron Beam Ion Source (EBIS), is brought into operation during this period. A joint project with NASA, this injector replaces the aging tandems at RHIC and will provide new ion beams for research and result in more cost-effective operations.
- R&D is supported for a potential upgrade project for the RHIC facility (RHIC II) to increase the beam luminosity by a factor of 10, thereby enabling researchers to fully characterize the new states of matter discovered there and to study saturated gluonic matter.

- R&D is supported to provide the basis for a possible decision to initiate conceptual and project engineering design at the end of this planning period leading toward the construction of a U.S. world-class exotic beam facility. It is conceivable that this facility, after input from the scientific community and various advisory panels, would be focused on reaccelerated exotic beams to complement exotic beam capabilities elsewhere in the world and to allow U.S. researchers to be among the leaders in nuclear structure and astrophysics studies. Such a facility would allow researchers to discover new states/structures of nuclear matter, to measure reaction rates to understand what happens in cataclysmic astrophysics events such as supernovae and the origin of the chemical elements, and to create specific nuclei whose properties and decays can be used to search for new physics beyond the Standard Model.

Research

- Research efforts at RHIC are aimed at characterizing the newly discovered new states of matter with heavy ion beams and establishing the contributions of gluons to the spin of the proton (an unanswered question at this time) using a polarized beam. The answers to these fundamental questions cannot be obtained at any other existing or planned facility world-wide.
- The GRETINA gamma-ray tracking array, a major item of equipment to be completed by the end of this decade, will provide up to two-orders of magnitude improvement in sensitivity and can be used at ATLAS, HRIBF, and the National Superconducting Cyclotron Laboratory at Michigan State University to discover new structures and behaviors of the atomic nucleus.
- The Fundamental Neutron Physics Beamline (FNPB), under fabrication at the SNS, will provide world-leadership neutron beams for measuring the properties of the neutron, including a high precision measurement of the electric dipole moment of the neutron with a high-potential for revealing new physics beyond the Standard Model.
- U.S. participation in the heavy-ion program at the LHC, when it begins physics operations around FY 2008, will provide U.S. researchers with the opportunity to search for new states of matter under substantially different initial conditions than those provided by RHIC, providing another piece of the puzzle regarding the matter that existed during the infant universe.
- Following the highly successful Sudbury Neutrino Observatory and Kamioka Liquid-scintillator Anti-Neutrino Detector (KamLAND) experiments, which have revealed new properties of neutrinos, a neutrinoless Double Beta Decay experiment is planned to measure the nature and mass of the neutrino. Neutrinos play a critical role in the explosions of supernovae and the evolution of the cosmos, as well as new physics beyond the Standard Model.
- Planned investments in Lattice Quantum ChromoDynamic Computing with HEP provide the opportunity for model simulations that could lead to dramatic breakthroughs in our understanding of the interactions of the fundamental building blocks of nature and the forces involved.
- Accelerator R&D efforts directed at next-generation nuclear physics research capabilities as well as core competencies in superconducting radio-frequency (SRF) accelerator technologies and in advanced cooling techniques of accelerator beams are supported.
- NP contributes to an SC effort directed at basic research leading to transformational energy technologies by supporting nuclear data measurements and code development relevant to the design of next generation nuclear reactors.

- During this period over 400 graduate students supported by the Nuclear Physics program would receive their Ph.D. degrees and enter the workforce.

Reallocations to Support SC Priorities:

User Facility Operations

- With the completion of their planned scientific programs, the small experiments at RHIC are phased out. The Phobos detector has already terminated operations and the BRAHMS detector would do so in this planning period.

Research

- The Laser Electron Gamma Source (LEGS) program at the BNL NSLS facility, which studies the nucleon's structure, completes taking data at the end of FY 2006 and is phased out as data analyses are completed.
- Operations of the MIT/Bates Linear Accelerator Center were phased out in FY 2005. DOE intends to provide funding to MIT in FY 2006 through FY 2008 as part of an agreement that turns ownership of the facility over to MIT in exchange for MIT assuming responsibility for all future decontamination and decommissioning activities and liability for the facility.

NUCLEAR PHYSICS

Performance Targets

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Program Goal 05.20.00.00 – Explore Nuclear Matter, from Quarks to the Stars				
Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time will be greater than 80%.	Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time will be greater than 80%.	Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time will be greater than 80%.	Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time will be greater than 80%.	Average achieved operation time of the scientific user facilities as a percentage of the total scheduled annual operation time will be greater than 80%.
Medium Energy Nuclear Physics				
Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments in Hall A (2.2), Hall B (11.6), and Hall C (2.6), respectively, at the Continuous Electron Beam Accelerator Facility.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments in Hall A, Hall B, and Hall C, respectively, at the Continuous Electron Beam Accelerator Facility. The actual targets will be established in the FY 2008 Budget Request.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments in Hall A, Hall B, and Hall C, respectively, at the Continuous Electron Beam Accelerator Facility. The actual targets will be established in the FY 2009 Budget Request.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments in Hall A, Hall B, and Hall C, respectively, at the Continuous Electron Beam Accelerator Facility. The actual targets will be established in the FY 2010 Budget Request.	Accelerator is shut down for installation of the 12 GeV energy upgrade so there is no running. Zero events in each hall.
Weighted average number (within 30% of baseline estimate) of millions of proton collision events sampled by the PHENIX (127,000) and recorded by the STAR (158) detectors, respectively during the polarized proton run at the Relativistic Heavy Ion Collider.	Weighted average number (within 30% of baseline estimate) of millions of proton collision events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2008 Budget Request.	Weighted average number (within 30% of baseline estimate) of millions of proton collision events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2009 Budget Request.	Weighted average number (within 30% of baseline estimate) of millions of proton collision events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2010 Budget Request.	Weighted average number (within 30% of baseline estimate) of millions of proton collision events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2011 Budget Request.
Heavy Ion Nuclear Physics				
Weighted average number (within 30% of baseline estimate) of millions of events sampled by the PHENIX (30,000) and recorded by the STAR (100) detectors, respectively during the heavy ion run at the Relativistic Heavy Ion Collider.	Weighted average number (within 30% of baseline estimate) of millions of events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2008 Budget Request.	Weighted average number (within 30% of baseline estimate) of millions of events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2009 Budget Request.	Weighted average number (within 30% of baseline estimate) of millions of events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2010 Budget Request.	Weighted average number (within 30% of baseline estimate) of millions of events sampled by the PHENIX and recorded by the STAR detectors, respectively, at the Relativistic Heavy Ion Collider. The actual targets will be established in the FY 2011 Budget Request.

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Low Energy Nuclear Physics				
Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments at the Argonne Tandem Linac Accelerator System (22) and Holifield Radioactive Ion Beam (1.8) facilities, respectively.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments at the Argonne Tandem Linac Accelerator System and Holifield Radioactive Ion Beam facilities, respectively. The actual targets will be established in the FY 2008 Budget Request.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments at the Argonne Tandem Linac Accelerator System and Holifield Radioactive Ion Beam facilities, respectively. The actual targets will be established in the FY 2009 Budget Request.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments at the Argonne Tandem Linac Accelerator System and Holifield Radioactive Ion Beam facilities, respectively. The actual targets will be established in the FY 2010 Budget Request.	Weighted average number (within 20% of baseline estimate) of billions of events recorded by experiments at the Argonne Tandem Linac Accelerator System and Holifield Radioactive Ion Beam facilities, respectively. The actual targets will be established in the FY 2011 Budget Request.

Fusion Energy Sciences (FES)

	B/A (dollars in thousands)					
	FY 2006 Approp.	FY 2007 Request	FY 2008	FY 2009	FY 2010	FY 2011
User Facility Operations	62,726	65,767	67,276	82,791	86,215	86,056
ITER Total Estimated Cost (TEC)[1]	15,866	37,000	149,500	208,500	208,500	180,785
Research	209,052	216,183	210,224	202,709	206,285	217,159
Total, FES	287,644	318,950	427,000	494,000	501,000	484,000

PRIORITIES:

User Facility Operations

- DIII-D and C-Mod, the FES program's major tokamak facilities, continue to operate for 12 weeks and 15 weeks respectively, the level planned in FY 2007. At this level of operations, U.S. scientists are able to carry out about one-third to one-half of the experimental proposals that are submitted to the facilities, with the best proposals selected through peer review.
- The National Spherical Torus Experiment (NSTX) is the current alternate concept facility at the Princeton Plasma Physics Laboratory, with fabrication of the National Compact Stellarator Experiment (NCSX) completed in FY 2009 to investigate the unique physics of compact stellarators. The NSTX continues operations at the FY 2007 level of 12 weeks until NCSX comes on line. Once NCSX is fully operational, NCSX and NSTX alternate operating 24 weeks every other year. Each facility will be serviced and modified, as appropriate, during the periods when the other facility is in operation. This plan for alternate periods of operations and upgrades permits the most cost-effective use of shared components and subsystems as well as the joint team of scientists, engineers, and technicians.

ITER

- DOE will continue to participate as a full partner in the ITER project, a Presidential priority and the critical next step on the path to fusion energy. The ITER mission is to demonstrate the scientific and technological feasibility of fusion in a facility that for the first time will be able to produce a sustained, burning plasma much like that needed in a full scale fusion power plant. The cost of ITER is shared among the seven partners that have agreed to construct, operate, deactivate, and decommission the facility: China, the European Union, India, Japan, Korea, Russia, and the United States. This multilateral approach provides critical science to each partner at a fraction of the cost that each would have to pay if it undertook the project unilaterally. The European Union is hosting ITER in Cadarache, France, and pays roughly 45% of the project costs. The remaining 55% of the project costs is shared equally among the six remaining

1 ITER Other Project Cost funding is included within the Research line. Inclusion of ITER Other Project Costs with the Total Estimated Cost results in an ITER Total Project Cost funding level of $19,315,000 in FY 2006, $60,000,000 in FY 2007, $160,000,000 in FY 2008, $214,500,000 in FY 2009, $210,000,000 in FY 2010, and $181,285,000 in FY 2011.

partners. During the five years covered by this plan, the U.S. makes "in kind" contributions of equipment, personnel, and cash, including contingency, to the project. The U.S. is implementing its contributions through a Major Item of Equipment project called U.S. Contributions to ITER. After the international project team is assembled at the Cadarache site and the construction schedule is established, the U.S. project will establish its cost and schedule baseline, at Critical Decision 2. This milestone is tentatively planned for September 2007.

Research

- Research on all major fusion facilities includes support for the ITER project, and on joint experiments with the large tokamaks abroad on burning plasma studies.
- Two additional SciDAC projects are competitively selected in FY 2007. One focuses on developing the software tools for remote collaboration on foreign fusion facilities, and the other on laying the ground work for developing an integrated capability for simulating the behavior of fusion plasmas. These two projects and the other ongoing SciDAC work will continue throughout the five year period.
- Research continues on the development of the fundamental understanding of the plasma science necessary to explore innovative, improved pathways to plasma confinement.
- Research on High Energy Density Physics focuses on heavy ion beam science and fast ignition, with research also on plasma jets.
- Research support continues for development of enabling technologies to enhance plasma performance on both current and planned domestic machines as well as for international collaborations.
- The other non-ITER elements of the research program are maintained at roughly the FY 2007 level of effort.

FUSION ENERGY SCIENCES

Performance Targets

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Program Goal 05.24.00.00 (World-Class Scientific Research Capacity)				
Science				
Conduct experiments on major fusion facilities leading toward the predictive capability for burning plasmas and configuration optimization. – In FY 2007, FES will measure and identify magnetic modes on NSTX that are driven by energetic ions traveling faster than the speed of magnetic perturbations (Alfvén speed); such modes are expected in burning plasmas such as ITER.	Conduct scheduled experiments on fusion facilities.	Conduct scheduled experiments on fusion facilities.	Conduct scheduled experiments on fusion facilities.	Conduct scheduled experiments on fusion facilities.
Increase resolution in simulations of plasma phenomena—optimizing confinement and predicting the behavior of burning plasmas require improved simulations of edge and core plasma phenomena, as the characteristics of the edge can strongly affect core confinement. – In FY 2007, improve the simulation resolution of linear stability properties of Toroidal Alfvén Eigenmodes driven by energetic particles and neutral beams in ITER by increasing the number of toroidal modes used to 15.	Increase resolution in simulations of plasma phenomena—optimizing confinement and predicting the behavior of burning plasmas require improved simulations of edge and core plasma phenomena.	Increase resolution in simulations of plasma phenomena—optimizing confinement and predicting the behavior of burning plasmas require improved simulations of edge and core plasma phenomena.	Increase resolution in simulations of plasma phenomena—optimizing confinement and predicting the behavior of burning plasmas require improved simulations of edge and core plasma phenomena.	Increase resolution in simulations of plasma phenomena—optimizing confinement and predicting the behavior of burning plasmas require improved simulations of edge and core plasma phenomena.
Facility Operations				
Average achieved operational time of major national fusion facilities as a percentage of total planned operational time is greater than 90%.	Average achieved operational time of major national fusion facilities as a percentage of total planned operational time is greater than 90%.	Average achieved operational time of major national fusion facilities as a percentage of total planned operational time is greater than 90%.	Average achieved operational time of major national fusion facilities as a percentage of total planned operational time is greater than 90%.	Average achieved operational time of major national fusion facilities as a percentage of total planned operational time is greater than 90%.

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects kept to less than 10%.	Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects kept to less than 10%.	Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects kept to less than 10%.	Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects kept to less than 10%.	Cost-weighted mean percent variance from established cost and schedule baselines for major construction, upgrade, or equipment procurement projects kept to less than 10%.

Bonneville Power Administration
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

As the Nation moves forward to strengthen its national and economic security, the Department of Energy (DOE) leads a critical effort promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.

The Bonneville Power Administration (Bonneville or BPA) is the DOE's electric Power Marketing Administration for the Federal Columbia River Power System (FCRPS). Bonneville provides electric power, transmission, and energy efficiency throughout the Pacific Northwest. Created in 1937 to market and transmit the power produced by the Bonneville Dam on the Columbia River, Congress has since directed Bonneville to sell at wholesale the electrical power produced from 31 operating Federal hydro projects and to acquire non-Federal power and conservation resources sufficient to meet the needs of Bonneville's customer utilities. Bonneville also owns and operates over 15,000 miles of high-voltage transmission lines, transmitting power from the dams and other sources on an open-access non-discriminatory basis. Bonneville serves a 300,000 square mile area including Oregon, Washington, Idaho, Western Montana, and parts of Northern California, Nevada, Utah, and Wyoming.

The Bonneville Project Act of 1937 provided the foundation for Bonneville's statutory utility responsibilities and authorities. In 1974, passage of the Federal Columbia River Transmission System Act (Transmission System Act) placed Bonneville under provisions of the Government Corporation Control Act (31 U.S.C. 9101-9110). The legislation provided Bonneville with "self-financing" authority and established the Bonneville Fund, a revolving fund, allowing Bonneville to use its revenues from electric power and transmission ratepayers to directly fund all programs and to sell bonds to the U.S. Treasury (Treasury) to finance the region's high-voltage electric transmission system requirements.

Bonneville's program is treated as mandatory and nondiscretionary. As such, Bonneville is "self-financed" by the ratepayers of the Pacific Northwest and receives no annual appropriations from Congress. Under the Transmission System Act, Bonneville funds the expense portion of its budget and repays the Federal investment with revenues from electric power and transmission rates. Bonneville's revenues fluctuate primarily in response to market prices for fuels and stream flow variations in the Columbia River System due to weather conditions and fish recovery needs. Bonneville's permanent, indefinite statutory borrowing authority authorizes the agency to sell bonds to the Treasury up to a cumulative outstanding total of $4.45 billion. Through FY 2005, Bonneville has returned approximately $21.6 billion to the Treasury for payment of FCRPS O&M and other costs (about $2.9 billion), interest (about $11.4 billion), and amortization (about $7.3 billion) of appropriations and bonds. Bonneville made its full planned FY 2005 payment of $1,088 million to the Treasury, including $313 million in advanced amortization. Total FY 2005 credits applied for fish mitigation were about $45 million. For FY 2006, Bonneville plans to pay the Treasury $874 million: $436 million to repay investment principal, $415 million for interest, $23 million for pension and post-retirement benefits. The FY 2007 Treasury payment is currently estimated at $1,329 million. FY 2006 and FY 2007 4(h)(10)(C) credits associated with fish recovery are estimated at $89 million and $79 million, respectively.

Mission and Goals

The strategic mission of Bonneville is to create and deliver the best value for its customers and constituents as it acts in concert with others to assure the Pacific Northwest:

- An adequate, efficient, economical and reliable power supply;
- A transmission system that is adequate to the task of integrating and transmitting power from Federal and non-Federal generating units, providing service to BPA's customers, providing interregional interconnections, and maintaining electrical reliability and stability; and
- Mitigation of the FCRPS impacts on fish and wildlife.

BPA is committed to cost-based rates, open and non-discriminatory transmission access, and public and regional preference in its marketing of power. BPA will set its rates as low as possible consistent with sound business principles and the full recovery of all of its costs, including timely repayment of the Federal investment in the system.

Strategic, General, and Program Goals

Following publication of the Administration's National Energy Policy, DOE developed a Strategic Plan that defines its mission, four strategic goals for accomplishing that mission, and seven general goals to support the strategic goals. DOE's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environmental aspects of the mission plus seven general goals that tie to the strategic goals). The Bonneville program supports the following goal:

Energy Strategic Goal: To protect our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.

General Goal 4, Energy Security: Improve energy security by developing technologies that foster a diverse supply of reliable, affordable and environmentally sound energy by providing for reliable delivery of energy, guarding against energy emergencies, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency.

Bonneville's Program Goal contributes to the General Goal. This goal is Market and Deliver Federal Power:

Program Goal 04.54.00.00: Bonneville Power Administration. Market and Deliver Federal Power: Ensure Federal hydropower is marketed and delivered while passing the North American Electric Reliability Council's Control Compliance Ratings, meeting planned repayment targets, and achieving a recordable accident frequency rate at or below our safety performance standard.

Contribution to General Goal 4

Bonneville contributes to this goal through its strategic vision that emphasizes the basic core values of reliability, low rates consistent with sound business principles, environmental stewardship, and accountability to the region. BPA has renewed its emphasis on performance and has adopted 24 agency wide objectives that are key to achieving its mission. These objectives, aligned using the balanced scorecard model, are focused on stakeholder value, financial performance, internal operations, and

people and culture.

Bonneville's strategic direction has helped to identify a number of key long-term issues. These issues center on providing Bonneville customers certainty over load service obligations and enabling customers and the market to respond with the necessary electric industry infrastructure investments. Other key strategic interests include general market stability, BPA risk management, and long-term assurance of funding to repay the U.S. Treasury investment in infrastructure. Bonneville is now addressing these key issues as part of the second phase of the Regional Dialogue.

Priorities and Assumptions:

Bonneville Power Administration Funding Plan

($ in 000)	2006	2007	2008	2009	2010	2011
Total operating expenses	**2,635**	**2,465**	**2,685**	**2,783**	**2,803**	**2,904**
Capital investment:						
Power Business Line	210	201	213	205	199	200
Transmission Line	201	252	284	252	299	310
Capital Equipment & Bond Premium	26	24	33	27	28	27
Total Capital Investment	**437**	**477**	**530**	**484**	**526**	**537**
Projects Funded in Advance	72	95	72	115	119	70
Total obligations	**3,144**	**3,036**	**3,287**	**3,382**	**3,448**	**3,511**
Total Capital Transfers	**436**	**878**	**467**	**454**	**459**	**463**
Budget Authority (net)	**(80)**	**(441)**	**(115)**	**(170)**	**(80)**	**(80)**
Outlays (net)	**(80)**	**(480)**	**(115)**	**(170)**	**(80)**	**(80)**

Budget estimates are subject to change due to rapidly changing economic and institutional conditions in the evolving competitive electric utility industry.

The BPA budget has been prepared in accordance with the Budget Enforcement Act (BEA) of 1990. Under this Act all BPA budget estimates are treated as mandatory and are not subject to the discretionary caps included in the BEA. These estimates support activities which are legally separate from discretionary activities and accounts. Thus, any changes to BPA estimates cannot be used to affect any other budget categories which have their own legal dollar caps. Because BPA operates within existing legislative authority, BPA is not subject to a Budget Enforcement "pay-as-you-go" test regarding its revision of current-law funding estimates.

Net Outlay estimates are based on current cost savings to date and anticipated cash management goals. They are expected to follow anticipated management decisions throughout the rate period that along with actual market conditions will impact revenues and expenses. Actual Net Outlays are volatile and

are reported in SF-133. Estimated net outlay estimates could change due to changing market conditions, streamflow variability, and continuing restructuring of the electric industry.

Capital Transfers reflect, beginning in FY 2007, advance amortization payments to the United States Treasury on BPA's bond obligations. The advance payments are dependent on an equivalent amount of assumed net secondary revenues over $500 million and anticipated debt optimization refinancing of Energy Northwest obligations, consistent with both the President's budget and the sound business practices required under the Federal Columbia River Transmission System Act of 1974.

In recent years, BPA has made amortization payments in excess of those scheduled in its Federal Energy Regulatory Commission approved rate filings, resulting in a balance of advance repayment. Bonneville made its full planned FY 2005 payment of $1,088 million to the Treasury, including $313 million in advanced amortization.

Performance Targets:

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
		General Goal 4, Energy Security		
Attain average NERC compliance ratings for the following NERC Control Performance Standards (CPS) measuring the balance between power generation and load, including support for system frequency: (1) CPS-1, which measures generation/load balance on one-minute intervals (rating >=100); and (2) CPS-2, which limits any imbalance magnitude to acceptable levels (rating >=90).	Transmission System Reliability Performance: Attain average NERC compliance ratings for the NERC CPS measuring the balance between power generation and load, including support for system frequency.	Attain average NERC compliance ratings for the NERC CPS measuring the balance between power generation and load, including support for system frequency.	Attain average NERC compliance ratings for the NERC CPS measuring the balance between power generation and load, including support for system frequency.	Attain average NERC compliance ratings for the NERC CPS measuring the balance between power generation and load, including support for system frequency.
Meet planned annual repayment of principal on Federal power investments.	Repayment of Federal Power Investment: Meet planned annual repayment of principal on Federal power investments.	Meet planned annual repayment of principal on Federal power investments.	Meet planned annual repayment of principal on Federal power investments.	Meet planned annual repayment of principal on Federal power investments.
Hydropower Generation Efficiency Performance: Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation.	Hydropower Generation Efficiency Performance: Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation.	Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation.	Achieve 97.5% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation.	Achieve 98% Heavy-Load-Hour Availability (HLHA) through efficient performance of Federal hydro-system processes and assets, including joint efforts of BPA, Army Corps of Engineers, and Bureau of Reclamation.
Achieve a frequency rate of no more than 2.7 recordable accidents per 200,000 hours worked or the Bureau of Labor and Statistics' industry rate, whichever is lower. The Department has determined a BPA stretch goal in FY 2007 of 2.7 recordable accidents per 200,000 hours worked.	Recordable Accident Frequency Rate: Achieve a frequency rate of no more than 2.7 recordable accidents per 200,000 hours worked or the Bureau of Labor and Statistics' industry rate, whichever is lower.	Achieve a frequency rate of no more than 2.7 recordable accidents per 200,000 hours worked or the Bureau of Labor and Statistics' industry rate, whichever is lower.	Achieve a frequency rate of no more than 2.7 recordable accidents per 200,000 hours worked or the Bureau of Labor and Statistics' industry rate, whichever is lower.	Achieve a frequency rate of no more than 2.7 recordable accidents per 200,000 hours worked or the Bureau of Labor and Statistics' industry rate, whichever is lower.

Southeastern Power Administration
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

As the Nation moves forward to strengthen its national and economic security, the Department of Energy (DOE) leads a critical effort promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.

Within the Southeastern Power Administration (Southeastern) appropriation, there is one program: Operation and Maintenance, which includes two subprograms: Purchase Power and Wheeling and Program Direction.

Mission and Goals

The mission of Southeastern is to market and deliver Federal hydroelectric power at the lowest possible cost to public bodies and cooperative utilities in the southeastern United States in a professional, innovative, customer-oriented manner, while continuing to meet the challenges of an ever-changing electric utility environment through continuous improvements.

Strategic, General, and Program Goals

The Department's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environmental aspects of the mission), plus seven general goals that tie to the strategic goals. The Southeastern appropriation supports the Energy Strategic Goal: To protect our national and economic security by reducing imports and promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy. And General Goal 4, Energy Security: Improve energy security by developing technologies that foster a diverse supply of affordable and environmentally sound energy by providing for reliable delivery of energy, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency.

The program funded within the Southeastern appropriation has one Program Goal that contributes to the General Goal in the "goal cascade." This goal is:

Program Goal 04.51.00.00: Southeastern Power Administration. Market and Deliver Federal Power: Customers receive the benefits of Federal power that produce adequate revenue to repay the American taxpayers' investments allocated to power.

Contribution to General Goal 4

Southeastern contributes to General Goal 4, Energy Security Goal, by performing its power marketing mission through two subprogram activities: Program Direction and Purchase Power and Wheeling.

Southeastern markets and delivers all available hydroelectric power from U. S. Army Corps of Engineers (Corps) dams, while balancing power needs with the diverse interests of other water resource users. Federal power is marketed and delivered in a cost-efficient manner assuring power system reliability and maximizing use of Federal assets to repay the investment (principal and interest), while supporting the President's Management Agenda.

[1]Southeastern Power Administration Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	5,544	5,723	6,000	6,000	6,000	6,000
Above Target (FY 2008-2011)	5,544	5,723	6,169	6,390	6,595	6,806

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

Southeastern supports the Department's Energy Strategic Goal by managing the dispatch and distribution of Federal hydroelectric power resources in the southeastern United States in an affordable and environmentally sound manner, while meeting National utility performance standards and balancing the diverse interests of other water resource users. Southeastern ensures effective management of the hydroelectric power resources and provides for: a diverse supply of generating resources that enhance regional power system reliability; power revenues that repay taxpayers' investment in the Federal power system; and regional economic benefits. Southeastern supports the Energy Security Goal by promoting strategies that enhance energy efficiency and renewable energy technologies. Effective management of hydroelectric resources, combined with promotion of energy efficiency and biomass and other renewable technologies, contribute to the long-term solution of economic and environmental challenges.

Power Marketing

- Southeastern will continue to repay Federal debt to the treasury and comply with all fiscal responsibilities.

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

Power Operations

- Southeastern will continue to accurately schedule power deliveries and comply with National Electric Reliability Council compliance standards.

Reallocations to Support Southeastern Priorities:

Power Marketing and Operations

- In FY 2008 travel and training will be reduced and in outyears FTE levels will be incrementally reduced as budget appropriations decline in real terms.
- To the greatest extent possible, reductions will be applied evenly across the agency.

Initially, travel and training budget reductions will impact electric reliability and contract officer compliance training schedules and customer meeting attendance. Southeastern coordinates power marketing and energy efficiency and renewable energy activities among Federal agencies, Investor-Owned, and publicly-owned utilities and other interests across the Southeast. As a transmission-dependent entity, Southeastern participates in meetings in which future transmission access rules are discussed and negotiated. Southeastern is an active participant in national and regional reliability councils and also meets with the Federal Energy Regulatory Commission (FERC). Southeastern travels to rate forums in various states, participates in operation and maintenance meetings with the U. S. Army Corps of Engineers, as well as customer contract and finance meetings. Other travel is associated with employee training in information management, security, operator licensing, and development.

- Equipment and software replacements will be postponed.

Southeastern operates a lean organization with 42 FTEs and has little room to cut expenditures, since ancillary expenses associated with operating the agency are tied to object classifications and are fixed, regardless of the FTE level. Expense items include: GSA rent, emergency site rent, audit, cyber and physical security mandates, communications, utilities, miscellaneous, printing and reproduction, tuition, maintenance, supplies and materials, contract services, equipment, and the working capital fund. Salary and benefits will be reduced to accommodate fixed operating expenses. Operating expenses increase annually due to inflation and unplanned and unfunded mandated requirements such as HSPD-12.

FUNDING SCENARIO II - ABOVE TARGET

Priorities and Assumptions:

The above target scenario assumes increases in FY 2008 through FY 2011 aimed at maintaining power marketing and power operations at the level that will be achieved based on the FY 2007 request, and include funding to comply with mandatory electric reliability standards relating to operator certification and training, and implementation of compliance monitoring programs. An updated strategic plan will be developed this year that may require adjusting to meet new budget requirements. As of FY 2006, Southeastern has nine FTEs who are presently eligible for retirement. An additional six will become eligible by FY 2011. Southeastern is planning for lump sum payments for unused leave plus new hire relocation expenses.

DOE's Strategic and General Goals will be accomplished, not only through the efforts of the major program offices in the Department, but with additional effort from offices which support the programs in carrying out the mission. Southeastern performs critical functions that directly support the mission of the Department. These functions include: marketing and delivering hydroelectric power generated at Federal hydroelectric projects in the southeast; and promoting energy efficiency and development of renewable energy among cooperative and municipal utility customers.

Power Marketing

- Southeastern will continue to promote energy security through marketing a reliable, clean and affordable supply of energy.
- Cyber and physical security require additional resources. Security audits, which were previously funded by the department, will be paid for with Program Direction funding.
- Additional communication expenses accompany our mission to provide low-cost hydroelectric power. Southeastern must maintain a communications network encompassing 22 hydroelectric projects across 11 Southeastern states. The utility industry deploys intensively technical communication and control equipment required to operate the power dispatch in a timely manner.
- Accounting for agency finances is accomplished using Oracle software, which is periodically upgraded at considerable expense. Rate setting requires extensive database maintenance along with significant investments in IT equipment. Necessary funding is required for the system upgrades. Southeastern has converted a human resources staff position to IT in order to respond to the growing volume of IT maintenance.
- The IT office also maintains an emergency site in a state of perpetual readiness, capable of becoming Southeastern's operating hub.

Power Operations

- Funding to address recent utility industry changes that were designed to enhance reliability of the interconnected utility system would continue at the FY 2007 level through FY 2011. These changes include transmission system open access, industry reforms stemming from the 2003 blackout, and the Energy Policy Act of 2005.

- Continued managing for excellence will require achievement of mandatory energy reliability standards requiring travel and training resources to attend off-site operator certification classes at the regional transmission organization (RTO) assigned venue. Between FY 2008 and FY 2010 each of 10 personnel will receive 160 hours of continuing education to maintain certification. This will significantly expand the travel and training budgets above previous levels.
- In the past, Southeastern has substituted more intensive use of technology in lieu of additional FTEs. An additional FTE will be required to fulfill additional IT and operating responsibilities.

Reallocations to Support Southeastern Priorities:

- Postponement of IT equipment replacement and operation center communication equipment. Reduced travel to customer meeting and reliability council meetings.
- Appropriations received in amounts greater than the constrained growth scenario would be put to use by Southeastern to improve its ability to address enhanced compliance requirements that were set forth in the Energy Policy Act of 2005. Discretionary NERC compliance standards are now mandatory. In order to fully comply with NERC regulations Southeastern would hire 2 FTE's to accommodate the administrative tasks associated with the mandatory regulations and improve energy scheduling reliability. The priority to improve compliance and scheduling reliability aligns with the President's Management Agenda and the Department's strategic security and energy reliability initiatives.

Performance Targets

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances. (ER4-51)	Meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances. (ER4-51)	Meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances. (ER4-51)	Meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances. (ER4-51)	Meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances. (ER4-51)
Southeastern will provide power at the lowest possible cost by keeping projected O&M cost per Kilowatt-hour below the national average for hydropower.(ER4-51)	Southeastern will provide power at the lowest possible cost by keeping projected O&M cost per Kilowatt-hour below the national average for hydropower.(ER4-51)	Southeastern will provide power at the lowest possible cost by keeping projected O&M cost per Kilowatt-hour below the national average for hydropower.(ER4-51)	Southeastern will provide power at the lowest possible cost by keeping projected O&M cost per Kilowatt-hour below the national average for hydropower.(ER4-51)	Southeastern will provide power at the lowest possible cost by keeping projected O&M cost per Kilowatt-hour below the national average for hydropower.(ER4-51)
Achieve full compliance with NERC's Regional Compliance Enforcement Plan by having no unresolved compliance issues. (ER4-51)	Achieve full compliance with NERC's Regional Compliance Enforcement Plan by having no unresolved compliance issues. (ER4-51)	Achieve full compliance with NERC's Regional Compliance Enforcement Plan by having no unresolved compliance issues. (ER4-51)	Achieve full compliance with NERC's Regional Compliance Enforcement Plan by having no unresolved compliance issues. (ER4-51)	Achieve full compliance with NERC's Regional Compliance Enforcement Plan by having no unresolved compliance issues. (ER4-51)
Repay $40.7 million annually under average water conditions to meet required payments as they come due and assure that all aged investments will be replaced on a timely basis now and in the future. (ER4-51)	Repay $40.7 million annually under average water conditions to meet required payments as they come due and assure that all aged investments will be replaced on a timely basis now and in the future. (ER4-51)	Repay $40.7 million annually under average water conditions to meet required payments as they come due and assure that all aged investments will be replaced on a timely basis now and in the future. (ER4-51)	Repay $40.7 million annually under average water conditions to meet required payments as they come due and assure that all aged investments will be replaced on a timely basis now and in the future. (ER4-51)	Repay $40.7 million annually under average water conditions to meet required payments as they come due and assure that all aged investments will be replaced on a timely basis now and in the future. (ER4-51)
Economic Benefit Performance: Provide $643 million in annual economic benefits to the region under average water conditions. (ER4-51)	Economic Benefit Performance: Provide $651 million in annual economic benefits to the region under average water conditions. (ER4-51)	Provide $659 million in annual economic benefits to the region under average water conditions. (ER4-51)	Provide $667 million in annual economic benefits to the region under average water conditions. (ER4-51)	Provide $676 million in annual economic benefits to the region under average water conditions. (ER4-51)

Southwestern Power Administration
Five Year Plan
FY 2007 – FY 2011

OVERVIEW:

As the Nation moves forward to strengthen its National and economic security, Southwestern Power Administration (Southwestern) is a leader in this effort by delivering reliable, affordable, and environmentally sound hydroelectric power. Under its authorizing legislation, Section 5 of the Flood Control Act of 1944, Southwestern exists to meet its public responsibilities to market and reliably deliver Federal power, recover power costs, and repay the Federal investment consistent with sound business principles, giving preference to public bodies and cooperatives while encouraging the most widespread use of the power.

In Southwestern's region, Federal power is distributed to nearly seven million end users in a six-state area: Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas. To integrate the operation of the hydroelectric generating plants and to market and deliver power from 24 multi-purpose Federal water projects operated by the U.S. Army Corps of Engineers (Corps) to its customers, Southwestern operates and maintains 1,380 miles of high-voltage transmission line, 24 substations, and 47 microwave and VHF radio sites. Southwestern's Headquarters is in Tulsa, Oklahoma; the Dispatch Center is in Springfield, Missouri; and power system maintenance crews are based in Jonesboro, Arkansas; Gore, Oklahoma; and Springfield, Missouri.

Southwestern's Five Year Plan represents a continuing program of providing power from year-to-year to the Southwest region. Southwestern's performance objectives and targets reflect its commitment to fulfill contractual obligations to its customers; its commitment to the American taxpayer to repay the Federal investment in the Federal power system; its commitment to meet its original purpose of providing economic benefits to the region; and its commitment to do its part as a transmission owner in the Nation's integrated transmission system to assure reliability.

Southwestern Power Administration Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	29,864	31,539	31,000	31,000	30,000	31,000
Purchased Power & Wheeling (PPW)	12,400	13,600	30,000	30,300	30,700	31,000
Subtotal	**42,264**	**45,139**	**61,000**	**61,300**	**60,700**	**62,000**
Alternative Financing, PPW	-9,400	-10,600	-17,800	-17,800	-18,000	-18,200
Offsetting Receipts, PPW	-3,000	-3,000	-12,200	-12,500	-12,700	-12,800
Total	**29,864**	**31,539**	**31,000**	**31,000**	**30,000**	**31,000**
Above Target (FY 2008-2011)	29,864	31,539	35,972	37,952	38,208	38,221
Purchased Power & Wheeling (PPW)	12,400	13,600	30,000	30,300	30,700	31,000
Subtotal	**42,264**	**45,139**	**65,972**	**68,252**	**68,908**	**69,221**
Alternative Financing, PPW	-9,400	-10,600	-17,800	-17,800	-18,000	-18,200
Offsetting Receipts, PPW	-3,000	-3,000	-12,200	-12,500	-12,700	-12,800
Total	**29,864**	**31,539**	**35,972**	**37,952**	**38,208**	**38,221**

Mission and Goals at the GPRA unit

Mission

The mission of Southwestern is to market and reliably deliver Federal hydroelectric power with preference to public bodies and cooperatives. This is accomplished by maximizing the use of Federal assets to repay the Federal investment and participating with other water resource users in an effort to balance their diverse interests with power needs within broad parameters set by the Corps, and implementing public policy.

Benefits

Southwestern's appropriation supports the Department of Energy's (DOE) Energy Strategic Goal by delivering reliable, affordable, and environmentally sound energy and operating a reliable transmission system, which is an integral part of the Nation's transmission grid. Southwestern, in conjunction with the Corps, participates in this effort by managing the multipurpose operation of the Federal hydropower

system to enable effective marketing, generation, and delivery of clean, reliable, cost-based electric power.

Southwestern's program provides the Nation numerous benefits, which include:

- Operating a reliable Federal power system in an effective, cost efficient, and environmentally sound manner while meeting National utility performance standards and balancing the diverse interests of other water resource users.
- Producing power at the lowest cost-based rates possible.
- Repaying the American taxpayers' investments in the Federal power system.
- Providing reliable delivery of power to customers.
- Providing approximately $468 million in economic benefits under average water conditions.
- Providing regional power restoration assistance to other non-hydropower generation sources during outage emergencies.
- Repaying the annual costs of operation of the Federal hydropower system with revenues from customers during the year those costs are incurred under normal operations.

Strategic, General, and Program Goals

The Department's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environmental aspects of the mission) plus seven general goals that tie to the strategic goals. The Southwestern Power Administration appropriation supports the following goal:

Energy Strategic Goal: To protect our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.

General Goal 4, Energy Security: Improve energy security by developing technologies that foster a diverse supply of reliable, affordable, and environmentally sound energy by providing for reliable delivery of energy, guarding against energy emergencies, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency.

The program funded within the Southwestern Power Administration appropriation has one Program Goal that contributes to the General Goal in the "goal cascade." This goal is:

Program Goal 04.52.00.00: Southwestern Power Administration: Market and Deliver Federal Power: Provide the benefits of Federal power to customers by selling and reliably delivering power from Federal multipurpose hydroelectric dams at the lowest cost-based rates possible that produce revenues sufficient to repay all power costs to the American taxpayers.

Total Program Funding Plan for Scenario I

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	29,864	31,539	31,000	31,000	30,000	31,000
Purchased Power & Wheeling (PPW)	12,400	13,600	30,000	30,300	30,700	31,000
Subtotal	**42,264**	**45,139**	**61,000**	**61,300**	**60,700**	**62,000**
Alternative Financing, PPW	-9,400	-10,600	-17,800	-17,800	-18,000	-18,200
Offsetting Receipts, PPW	-3,000	-3,000	-12,200	-12,500	-12,700	-12,800
Total	**29,864**	**31,539**	**31,000**	**31,000**	**30,000**	**31,000**

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

Southwestern contributes to the Energy Security Goal through four subprograms (Program Direction, Operations and Maintenance, Construction, and Purchased Power and Wheeling) supported by appropriations, Federal power receipts, and alternative financing arrangements, including net billing, bill crediting, and/or reimbursable authority (customer advances). This is accomplished by marketing and delivering all available hydroelectric power from the Corps' dams while participating with other water resource users in an effort to balance diverse interests with power needs within broad parameters set by the Corps; operating and maintaining a Federal power system, which is an integral part of the Nation's electrical grid, in an effective and cost efficient manner to assure reliability; and maximizing the use of Federal assets to repay the investment (principal and interest) as well as operation and maintenance costs of the Southwestern Federal power system while supporting the President's Management Agenda initiatives.

Reallocations to Support Priorities:

Funding Scenario I, OMB MAX Target Level, provided in the DOE Five-Year Plan will reduce Southwestern's ability to meet the requirements of the President's National Energy Policy, the Energy Policy Act of 2005 (EPACT), and DOE's Transmission Grid Study to prevent further deterioration of the Nation's infrastructure and removing transmission constraints. The means and strategies that will be affected by the target level include:

- **Postpone Needed Operations and Maintenance and Construction Projects**
  - In support of EPACT, the Administration's National Energy Policy goals, and the transmission open access, Southwestern is participating in the Southwest Power Pool's

Regional Transmission Organization (SPP RTO), through a contract containing provisions consistent with those set out in the EPACT. In addition, the SPP RTO has indicated that it may consider working with DOE in designating portions of Southwestern's Federal transmission system as part of a National interest electric transmission corridor to serve significant load growth in northwest Arkansas.

- Southwestern's limited target level for the outyears will only fund minimal critical additions, replacements, and interconnections. Southwestern will require over target outyear funding levels to prepare the integrated Federal transmission system for the 21st Century. The RTO in Southwestern's marketing area performed a system impact study that resulted in the requirement to re-conductor the Idalia-Asherville line, thus improving the transmission infrastructure by alleviating power flow constraints, eliminating line overloading, as required under DOE's National Transmission Grid Study and the NEP. Not funding the over target increments will place Southwestern in violation of reliability criteria set forth by the North American Electric Reliability Council (NERC) and the RTO. In FY 2009 to FY 2011, the planned projects will assist in improving the reliability and integrity of the Federal power system, which is part of the National electrical grid. Not funding the over target increments in FY 2009 to FY 2011 will reduce the reliability and integrity of the interconnected Federal power system.
- Operate the Federal power system effectively and efficiently by using up-to-date power system technology and update workforce skills by providing training, including in-house capability for certification and annual emergency operations training for power system dispatchers consistent with NERC requirements.
- To promote improved reliability, communication, and system control, Southwestern is replacing its Supervisory Control and Data Acquisition system computers with a system that provides better monitoring and control of generation and transmission system assets to enhance the system operator's situational awareness under both normal operating conditions and emergencies.
- Conduct business process reviews to maximize efficiency and eliminate redundancy.
- Maximize the capabilities of business systems to improve processes and provide greater efficiency.

- **Postpone Security Upgrades – Short Term**
  - Maintain the security of the Federal power system, facilities, and information technology (IT) systems.
- **Human Capital Impacts – Reduce Training, Developmental Programs, Retention and Recruitment Incentives.**
  - Maintain a diverse and knowledgeable workforce by employee training, skills gap analysis, leadership development, retention programs, and aggressive recruitment activities, and meet NERC requirements by performing certification and annual emergency operations training for its power system dispatchers and others on a space available basis.
  - Address changes in the electric utility industry, technology, and workload by moving administrative and indirect positions to direct ("front line") positions as opportunities arise.

- **Reduced Travel – Eliminate Non-Transmission System Related Travel**

- Southwestern coordinates operational activities with the Corps, competing resources interests, the Southwest Power Pool Regional Transmission Organization, NERC, and its customers to provide the most efficient use of Federal assets.

Total Program Funding Plan for Scenario II

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2008-2011)	29,864	31,539	35,972	37,952	38,208	38,221
Purchased Power & Wheeling (PPW)	12,400	13,600	30,000	30,300	30,700	31,000
Subtotal	**42,264**	**45,139**	**65,972**	**68,252**	**68,908**	**69,221**
Alternative Financing, PPW	-9,400	-10,600	-17,800	-17,800	-18,000	-18,200
Offsetting Receipts, PPW	-3,000	-3,000	-12,200	-12,500	-12,700	-12,800
Total	**29,864**	**31,539**	**35,972**	**37,952**	**38,208**	**38,221**

FUNDING SCENARIO II - ABOVE TARGET

Priorities and Assumptions:

- Funding Scenario II, above target, would provide for critical transmission replacements, a critical component in meeting the DOE Strategic and General Goal 4, Energy Security as well as Southwestern's Program Goal to Market and Deliver reliable power.
- In support of the Energy Policy Act of 2005 (EPACT), the Administration's National Energy Policy goals, and the transmission open access, Southwestern is participating in SPP RTO, through a contract containing provisions consistent with those set out in the EPACT. In addition, the SPP RTO has indicated that it may consider seeking designation of portions of Southwestern's Federal transmission system as part of a National interest electric transmission corridor to serve significant load growth in northwest Arkansas.
- Above target assumes increases in FY 2008 through FY 2011 aimed at maintaining activities at the level that will be achieved based on the FY 2007 request, and includes funding to comply with mandatory electric reliability standards relating to operator certification and training, and implementation of compliance monitoring programs. An updated strategic plan will be developed this year that may require adjusting to meet new budget requirements.
- DOE's Strategic and General Goals will be accomplished, not only through the efforts of the major program offices within DOE, but with additional effort from offices which support the programs in carrying out the mission. Southwestern performs critical functions that directly support the mission of the Department. These functions include: marketing and delivering

hydroelectric power generated at Federal hydroelectric projects in the southwest; and promoting energy efficiency and development of renewable energy among cooperative and municipal utility customers.

Reallocations to Support Priorities

Southwestern is a leader in its industry and strives for more efficiency and effectiveness at all times. Scenario II is the best case, which enables Southwestern to complete all budgeted projects that increase the reliability and integrity of the interconnected Federal power system.

- Southwestern will continue to:
  - Promote energy security through marketing a reliable, clean, and affordable supply of energy.
  - Provide economic benefits to the region by marketing and delivering all available hydropower.
  - Assure power rates are sufficient to repay the Federal investment by conducting annual power repayment studies and submitting needed rate adjustments to DOE and the Federal Energy Regulatory Commission (FERC) for approval.
  - Perform maintenance, repair, and replacements of transmission, communication, and control system equipment to assure power system reliability.
  - Operate the Federal power system effectively and efficiently by using up-to-date power system technology and update workforce skills by providing training, including in-house capability for certification and annual emergency operations training for power system dispatchers consistent with NERC requirements.

Performance Targets (Funding Scenario I – Target)

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Meet industry averages (CPS1: 169.3 and CPS2: 96.7) and at a minimum, meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances.	Meet industry averages (CPS1: 169.3 and CPS2: 96.7) and at a minimum, meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances.	Meet industry averages (CPS1: 169.3 and CPS2: 96.7) and at a minimum, meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances.	Meet industry averages (CPS1: 169.3 and CPS2: 96.7) and at a minimum, meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances.	Meet industry averages (CPS1: 169.3 and CPS2: 96.7) and at a minimum, meet NERC Control Performance Standards (CPS) of CPS1>100 and CPS2>90. CPS1: minute by minute measures a generating system's ability to match supply to changing demand requirements and support desired system frequency (about 60 cycles per second); CPS2: measures systems ability to limit the magnitude of generation and demand imbalances.
Provide power at the lowest possible cost by keeping average operation and maintenance cost per kilowatt-hour below the National average for hydropower.	Provide power at the lowest possible cost by keeping average operation and maintenance cost per kilowatt-hour below the National average for hydropower.	Provide power at the lowest possible cost by keeping average operation and maintenance cost per kilowatt-hour below the National average for hydropower.	Provide power at the lowest possible cost by keeping average operation and maintenance cost per kilowatt-hour below the National average for hydropower.	Provide power at the lowest possible cost by keeping average operation and maintenance cost per kilowatt-hour below the National average for hydropower.
Provide $468 million in economic benefits to the region from the sale of hydroelectric power (under average water conditions).	Provide $474 million in economic benefits to the region from the sale of hydroelectric power (under average water conditions).	Provide $480 million in economic benefits to the region from the sale of hydroelectric power (under average water conditions).	Provide $486 million in economic benefits to the region from the sale of hydroelectric power (under average water conditions).	Provide $492 million in economic benefits to the region from the sale of hydroelectric power (under average water conditions).
Repay the Federal investment within the required repayment period.	Repay the Federal investment within the required repayment period.	Repay the Federal investment within the required repayment period.	Repay the Federal investment within the required repayment period.	Repay the Federal investment within the required repayment period.
Operate the transmission system so there are no more than 3 preventable outages annually.	Operate the transmission system so there are no more than 3 preventable outages annually.	Operate the transmission system so there are no more than 3 preventable outages annually.	Operate the transmission system so there are no more than 3 preventable outages annually.	Operate the transmission system so there are no more than 3 preventable outages annually.

Western Area Power Administration
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

As the Nation moves forward to strengthen its national and economic security, the Department of Energy (DOE) leads a critical effort promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy. Western Area Power Administration (Western), in conjunction with the U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the State Department's International Boundary and Water Commission, supports this critical effort by managing the multipurpose operation of the Federal hydropower system to effectively deliver a supply of reliable hydropower across a well operated and maintained, high-voltage, integrated transmission system, thereby limiting energy emergencies and reliance on energy imports.

Western, as one of four power marketing administrations (PMAs) within DOE, markets and delivers electricity primarily generated from hydropower projects located at Federally-owned dams. The transmission systems owned and operated by the PMAs, as an integral part of the nation's interconnected electric grid, make a significant contribution to ensuring the reliable delivery of the country's energy supply.

The Western Area Power Administration Program is comprised of three appropriation accounts; the Construction, Rehabilitation, Operation and Maintenance Account (CROM), the Falcon and Amistad Operating and Maintenance Fund, and the Colorado River Basins Power Marketing Fund (CRBPMF).

Mission

Western markets and delivers reliable, cost-based Federal hydroelectric power and related services in the central and western United States. Western repays the Federal investment for which it is responsible within the timeframes established by law and regulations.

Strategic, General, and Program Goals

The Department's Strategic Plan identifies four strategic goals (one each for defense, energy, science, and environmental aspects of the mission) plus seven general goals that tie to the strategic goals. The Western appropriations support the following strategic and general goals:

- Energy Strategic Goal: To protect our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy.
- General Goal 4, Energy Security: Improve energy security by developing technologies that foster a diverse supply of reliable, affordable and environmentally sound energy by providing for reliable delivery of energy, guarding against energy emergencies, exploring advanced technologies that make a fundamental improvement in our mix of energy options, and improving energy efficiency.

- The Western program funded by the CROM Account, the Falcon and Amistad Operating and Maintenance Fund, and the CRBPMF has one Program Goal that contributes to the General Goal in the "goal cascade." This goal is:

    - Program Goal 04.53.00.00: Western Area Power Administration - Market and deliver Federal power to assure that customers receive the benefits of Federal resources while producing sufficient revenue to repay the American taxpayers' investments allocated to power.

Contribution to General Goal 4

Western contributes to General Goal 4, Energy Security, by performing its power marketing mission in a manner that:

- ensures the reliability of its power system in an evolving electric utility industry,
- repays the United States Treasury for the costs associated with generating and transmitting power and related services within the timeframes established by law and regulation, and
- Maintains the safety of employees and the public.

[1] Western Area Power Administration Funding Plan

(Dollars in thousands)

($ in 000)	FY 2006 Approp	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007-2011)						
CROM Operating Expenses (Gross)	572,949	688,511	673,925	695,659	725,929	728,400
Less Use of Alternative Financing	-58,135	-197,741	-227,052	-249,779	-275,387	-273,570
Offsetting Collections from Colorado River Dam Fund (P.L. 98-381)	-4,162	-3,705	-3,707	-3,819	-3,934	-4,052
Offsetting Collections, Purchase Power and Wheeling (PPW)	-279,000	-274,852	-238,166	-239,061	-245,608	-247,778
Total, CROM (Budget Authority (BA) –	**231,652**	**212,213**	**205,000**	**203,000**	**201,000**	**203,000**
Total, Falcon and Amistad Operating and Maintenance Fund (BA – OMB MAX)	**2,665**	**2,500**	**3,000**	**3,000**	**3,000**	**3,000**
CRBPMF Operating Expenses	171,268	221,081	214,203	212,240	214,080	215,404
Offsetting Collections Realized	-194,268	-244,081	-236,203	-234,240	-237,080	-237,404
Total, CRBPMF (BA – Target)	**-23,000**	**-23,000**	**-22,000**	**-22,000**	**-23,000**	**-22,000**
Total, Western Area Power Administration (Budget Authority)	211,317	191,713	186,000	184,000	181,000	184,000

FUNDING SCENARIO I - TARGET

Priorities and Assumptions:

- Construction, Rehabilitation, Operation and Maintenance – Outyear target budget authority levels for Western's CROM Account do not provide the level of resources necessary to operate, maintain, and rehabilitate the extensive Federal transmission system. Western will seek alternative non-Federal financing to protect the Federal infrastructure and to provide the level of service and reliability that customers, neighboring utilities, regulators, and the industry expect.

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

Alternative financing anticipated in FY 2008 through FY 2011 for non-purchase power and wheeling needs is anticipated to average $88 million per year; $44.6 million is estimated for FY 2007.

- Falcon and Amistad Operating and Maintenance Fund – Outyear target budget authority levels provide for the continued operation and maintenance of the Falcon and Amistad Dams.
- Colorado River Basins Power Marketing Fund – Although negative, the outyear target budget authority for this account is adequate, and is consistent with the 'revolving authority' for the programs that operate within this fund. Receipts from the sale of power for the power systems operating within this account are expected to exceed the power systems' annual operating costs.

Reallocations to Support Western Priorities:

- Construction, Rehabilitation, Operation and Maintenance – Limited budget authority provided in the outyears will be applied to Western's highest priorities, and to those areas where Congress has consistently directed funding.

    - Operations and Maintenance (O&M) – The O&M subprogram will be fully funded, the O&M program is critical to the daily operating and maintenance requirements of the 17,000-mile transmission system. Western's O&M subprogram supports DOE's Energy Security goal to protect our national and economic security by reducing imports and promoting a diverse supply of reliable, affordable, and environmentally sound energy. Western ensures reliable electric power in a safe, cost-effective manner, and achieves continuity of service throughout its 15-State service territory by maintaining its power system at or above industry maintenance standards, rapidly restoring service following any system disturbance, mitigating adverse environmental impacts, performing clean-up activities, and maximizing revenues gained from non-firm energy sales.
    - Utah Reclamation, Mitigation, and Conservation – While not a specific Western priority, this funding which is transferred to the Department of Interior, Utah Reclamation, Mitigation and Conservation Commission, for execution is a Congressional priority. Western's proposes to fully fund this appropriation requirement during the FY 2008 through FY 2011 period.
    - Program Direction (PD) – Western proposes to allocate the remaining budget authority within the limited target level to the PD subprogram. All staffing and related activities necessary to operate, maintain, and rehabilitate the Federal transmission system are funded within the PD subprogram. The remaining budget authority within the limited target levels does not provide full funding for the PD outyear needs. Western will seek alternative financing from customers to secure funding for the remaining PD needs estimated at $8.9 million, $16.5 million, and $22.4 million for FY 2009 through FY 2011, respectively.
    - Construction and Rehabilitation (C&R) – Within the limited outyear target budget authority levels, Western proposes to eliminate or defer funding of the C&R subprogram in order to focus the limited target funding on the critical daily operation, maintenance, and staffing requirements within the O&M and PD subprograms. To ensure the reliability of the Federal power system, Western will seek substantial customer financing for planned C&R work anticipated during the FY 2008-2011 period; these needs are currently estimated at $69.0 million, $75.8 million, $87.8 million, and $72.6 million, respectively. Where alternative financing is not sufficient or timely, Western has 'Emergency Fund' authority to defray expenses due to unusual or emergency conditions causing or threatening interruption in power service.

Annual Performance Targets

FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets

Western Area Power Administration

System Reliability Performance: Attain acceptable North American Electric Reliability Council (NERC) ratings for the following Control Performance Standards (CPS) measuring the balance between power generation and load: 1) CPS1 which measures generation/load balance and support system frequency on one minute intervals (rating>100); and 2) CPS2 which limits any imbalance magnitude to acceptable levels (rating>90).	System Reliability Performance: Attain acceptable North American Electric Reliability Council (NERC) ratings for the following Control Performance Standards (CPS) measuring the balance between power generation and load: 1) CPS1 which measures generation/load balance and support system frequency on one minute intervals (rating>100); and 2) CPS2 which limits any imbalance magnitude to acceptable levels (rating>90).	System Reliability Performance: Attain acceptable North American Electric Reliability Council (NERC) ratings for the following Control Performance Standards (CPS) measuring the balance between power generation and load: 1) CPS1 which measures generation/load balance and support system frequency on one minute intervals (rating>100); and 2) CPS2 which limits any imbalance magnitude to acceptable levels (rating>90).	System Reliability Performance: Attain acceptable North American Electric Reliability Council (NERC) ratings for the following Control Performance Standards (CPS) measuring the balance between power generation and load: 1) CPS1 which measures generation/load balance and support system frequency on one minute intervals (rating>100); and 2) CPS2 which limits any imbalance magnitude to acceptable levels (rating>90).

The Office of Legacy Management
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

The mission of the Office of Legacy Management is to manage the department's post-closure responsibilities and ensure the future protection of human health and the environment. This Office has control and custody for legacy lands, structures, and facilities and is responsible for maintaining them at levels suitable for their long-term use.

The Legacy Management program provides benefits to the Department following mission change or site closure. For sites where cleanup is completed, Legacy Management programs ensure that the remediation measures implemented during closure are protecting human health and the environment, that labor responsibilities for the contractor work force are being satisfied, and that other Departmental legacy responsibilities are met. By managing the real and personal property assets that remain after cleanup and closure, Legacy Management helps the Department reduce the magnitude of its physical resource management, the costs associated with such management, and actively promotes the beneficial reuse of those mission excess properties.

In support of its mission, the Legacy Management program has responsibilities in four main areas: long-term surveillance and maintenance; legacy archives management; pension and benefit continuity; and managing legacy lands and assets.

In managing its programs, the Office of Legacy Management conducts critical activities. The long-term surveillance and maintenance activities are necessary to satisfy legal agreements. Pension and benefit continuity activities honor contractual requirements between the Department and former management and operating contractors for the payment of pensions and post-retirement benefits for those contractors' workers. The archives management and land and asset management support these two functions.

[1]Office of Legacy Management Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target (FY 2007–2011)	77,812	200,990	197,124	198,121	197,690	201,577

Mission and Goal(s):

Within the Program Goal for the Legacy Management program, there are four sub goals that contribute to the general goal. These sub goals are:

- Protect human health and the environment through effective and efficient long-term surveillance and maintenance – Activities associated with this sub goal contribute to the general goal by managing the long-term surveillance and maintenance at sites where remediation has been essentially completed, allowing the Environmental Management program to concentrate its efforts on continuing to accelerate cleanup and site closure resulting in reduced risks to human health and the environment and reduced landlord costs.

- Preserve, protect, and make accessible legacy records and information – These activities assist the other activities by providing a central records management capability. This work is in compliance with the National Archives and Records Administration requirements and directly supports the administration of the Energy Employees Occupational Illness Compensation Program Act (EEOICPA) and Freedom of Information Act and Privacy Act requests. This enables more efficient operation of the other activities.

- Support an effective and efficient work force structured to accomplish Departmental missions and assure contractor worker pension and medical benefits – The Legacy Management program oversees some pension and benefit programs to meet the Department's contractual commitments.

- Manage legacy land and assets, emphasizing protective real and personal property reuse and disposition – These activities promote more efficient management of remediate sites and facilities and enables federal property to be returned to public and private use. This allows more resources to be focused on further risk reduction.

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

FUNDING SCENARIO I- TARGET

Priorities and Assumptions

In managing the Department's legacy activities, the Office of Legacy Management has little flexibility. Legally required payments must be made to pension funds for retired contractor personnel and contractual obligations for post-retirement benefits for these former workers must be paid. The Department must satisfy regulatory requirements for long-term surveillance and maintenance. Records management and asset management are integral to the accomplishment of these other activities. The last priority, reducing the Department's liability for pension plans, will produce long-term savings for the pension and benefit activity.

ASSUMPTIONS:

- The growth of existing contractor pension plan assets will enable the plans to remain at the minimum level required under the Employee Retirement Income Security Act without being required to augment those plans beyond the current additions projected by actuarial analysis.
- Actuarial assumptions associated with the cost of medical care for the contractor retirees (e.g., medical costs will increase at roughly 8% per year) are reasonably accurate.
- LM will be able to manage the addition of approximately 30 sites over the next ten years from the U.S. Army Corps of Engineers and the private licensees responsible for the remediation of former uranium mining and milling operations through efficiency gains. EM will transfer the funds associated with post-closure operation for DOE sites that have been cleaned up and no longer support ongoing Departmental missions.
- Remedies installed by EM, the U.S. Army Corps of Engineers, and the private licensees will remain effective if the scheduled set of maintenance activities are conducted in accordance with regulatory agreements.
- LM will complete construction and begin operation of a centralized Records Facility; thus reducing the costs associated with the current distributed records operation.

PRIORITIES:

- Meet minimum ERISA requirements for retiree pension plans.
- Meet contractual obligations associated with contractor work force post-retirement benefits, e.g., medical benefits and life insurance.
- Meet regulatory requirements associated with surveillance and maintenance while promoting beneficial reuse or disposal or properties.

- Maintain records and information in accord with regulatory requirements and be responsive to requests for information under the Freedom of Information Act (FOIA), Privacy Act, Energy Employees Occupational Illness Compensation Act (EEOICPA), and other laws.
- Maintain adequate staffing to manage or oversee the program activities.
- Reduce the Department's current liability associated with contractor pension plans.

LEGACY MANAGEMENT

Performance Targets (Funding Scenario I – Target)

FY 2006 Appropriation	FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
General Goal 6, Environmental Management					
Legacy Management Program/Legacy Management					
Ensure continued effectiveness of cleanup remedies through surveillance and maintenance activities at five sites in accordance with legal agreements	Maintain the protectiveness of installed environmental remedies through inspections and other actions at 100 percent of sites within LM's responsibility.	Maintain the protectiveness of installed environmental remedies through inspections and other actions at 100 percent of sites within LM's responsibility.	Maintain the protectiveness of installed environmental remedies through inspections and other actions at 100 percent of sites within LM's responsibility.	Maintain the protectiveness of installed environmental remedies through inspections and other actions at 100 percent of sites within LM's responsibility.	Maintain the protectiveness of installed environmental remedies through inspections and other actions at 100 percent of sites within LM's responsibility.
Reduce the ratio of program direction to the appropriation by 1 percent from the FY 2005 baseline	Reduce the cost of performing long-term surveillance and maintenance activities by 2 percent while meeting all regulatory requirements. Base is previous year's costs less inflation rate, costs for new sites, and one-time actions	Reduce the cost of performing long-term surveillance and maintenance activities by 2 percent while meeting all regulatory requirements. Base is previous year's costs less inflation rate, costs for new sites, and one-time actions	Reduce the cost of performing long-term surveillance and maintenance activities by 2 percent while meeting all regulatory requirements. Base is previous year's costs less inflation rate, costs for new sites, and one-time actions	Reduce the cost of performing long-term surveillance and maintenance activities by 2 percent while meeting all regulatory requirements. Base is previous year's costs less inflation rate, costs for new sites, and one-time actions	Reduce the cost of performing long-term surveillance and maintenance activities by 2 percent while meeting all regulatory requirements. Base is previous year's costs less inflation rate, costs for new sites, and one-time actions

Office of Fossil Energy
Five Year Plan
FY 2007–FY 2011

OVERVIEW:

Secure, affordable, and environmentally acceptable energy sources are essential for our Nation to maintain our high quality living standards for current and future generations. In support of this, the Fossil Energy Research and Development (FE R&D) program addresses issues related to the reliable, efficient, affordable, and environmentally sound use of fossil fuels.

The FE R&D program implements several key Presidential priorities under the umbrella of the President's Coal Research Initiative. The FE R&D component of the President's Hydrogen Fuel Initiative will work through partnerships with industry to develop the technologies needed to produce, store, and distribute hydrogen, and to use it in stationary applications. The President's FutureGen project will partner with industry to build and operate the world's first near-zero atmospheric emissions power plant that will produce electricity and hydrogen from coal while capturing and storing carbon dioxide. The President's Clean Coal Power Initiative (CCPI) will partner with industry to demonstrate advanced clean coal technologies at commercial scale.

Within the FE R&D Appropriation there are ten programs: Coal, Natural Gas Technologies, Petroleum - Oil Technologies, Program Direction, Plant and Capital Equipment, Environmental Restoration, Import/Export Authorization, Advanced Metallurgical Research, Cooperative Research and Development, and the Special Recruitment Program. Other programs which make up the Office of Fossil Energy include the Clean Coal Technology Program, the Strategic Petroleum Reserve, the Northeast Home Heating Oil Reserve, the Naval Petroleum and Oil Shale Reserves, and the Elk Hills School Lands Funds. Exhibit 1 below shows two funding scenarios for these programs – 'Target' and 'Above Target'.

[1]**Exhibit 1. Fossil Energy Five-Year Budget Authority Plan FY07-11**

(Dollars in thousands)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I						
Target for FY 2007–2011	841,639	648,876	775,000	624,000	615,000	623,000
Scenario II						
Above Target FY 2008-2011			923,187	759,866	840,917	800,212

Government Performance and Results Act

The purpose of the Government Performance and Results Act (GPRA) is to improve Federal program effectiveness by promoting a focus on results and service quality by systematically holding Federal agencies publicly accountable for achieving program results. As directed by GPRA, the Office of Fossil Energy has established mission and goals for each its major programs. In this exercise, FE has reported the impact on achieving these missions over the next five years based on two funding scenarios – Target and Above Target.

Reallocations to Support Priorities:

Funding program 04.56.00.00, Natural Gas Technologies and program 04.57.00.00, Oil Technology

The natural gas and oil program mission was to develop policies and environmentally friendly technologies that would have stimulated a diverse supply of natural gas and oil, both in North America and around the world, so that the market can function to the benefit of all Americans. Budget discipline necessitated close scrutiny of all Fossil Energy programs, using strict guidelines to determine their effectiveness and compare them to other programs offering more clearly demonstrated and substantial benefits. Given the recent high oil and gas prices, industry has the capability to fund R&D. As a result, the FY 2007 Budget will terminate the program.

The Program Assessment Rating Tool (PART) was developed by OMB to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities differently than through traditional reviews. A PART assessment of the Natural Gas R&D program was conducted for the FY 2004 Budget and a reassessment was conducted for the FY 2005 Budget. The program was rated "Ineffective" in the PART analysis based primarily on not demonstrating clear results of the research effort. As a result, the following activities will not be conducted: oil and natural gas recovery technology, including deep trek, methane hydrate, and Reservoir Life/Extension Management. Exhibit 2 shows two funding scenarios for the Gas and Oil Technology programs.

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1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

Exhibit 2. Oil and Gas Five-Year Budget Authority Plan FY07-11

(Dollars in thousands)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I						
Target for FY 2007–2011	64,350	-	-	-	-	-
Scenario II						
Above Target FY 2008-2011			-	-	-	-

Mission and Goals at the GPRA Unit: Program Goal 04.55.00.00, Near-Zero Atmospheric Emissions Coal-Based Electricity and Hydrogen Production

The Coal program supports the Department's mission to achieve national energy security in an economic and environmentally sound manner by developing the technological capability to dramatically reduce pollutant emissions from coal-fueled electricity generation plants, and dramatically reduce carbon emissions to achieve near-zero atmospheric emissions power production. In the near term this means developing technologies to improve power plant efficiencies and environmental performance. In the longer term, the aim is to nearly double energy plant efficiencies (from 33% to 60%), create the capability to achieve near-zero atmospheric emissions in producing low cost hydrogen from coal and sequester (capture and store) 90-100 percent of carbon from future coal plants at affordable costs of electricity, allowing coal to remain a key, strategic fuel for the Nation. The program mission is carried out in support of several Presidential priorities including the Coal Research Initiative, Clear Skies Initiative, Hydrogen Fuel Initiative, and the FutureGen project.

The Administration supports coal as an important part of our energy portfolio. This five-year plan would complete the President's campaign commitment to invest $2 billion on clean coal research over 10 years, three years ahead of schedule. The Coal program consists of FutureGen, a prototype facility that will produce electricity and hydrogen while sequestering carbon dioxide at a rate of one million metric tons per year; the CCPI, an industry-led, cost-shared demonstration program; and Fuels and Power Systems. The Fuels and Power Systems program includes advances to central station power generation equipment including emissions control technology (especially mercury); advanced turbines and gasification technology; advanced coal-based fuel cell technology; carbon sequestration, researching ways to mitigate or separate and dispose of greenhouse gas from combustion; and advanced research, a set of cross-cutting long-term research projects that can potentially contribute to many aspects of the coal research program. Exhibit 3 below shows for Program 04.55, Near-Zero Atmospheric Emissions Coal-Based Electricity and Hydrogen Production – Target and Above Target.

Exhibit 3. Program 04.55 Near-Zero Atmospheric Emissions Coal Based Electricity and Hydrogen Production Five-Year Budget Authority Plan FY07-11

(Dollars in thousands)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I						
Target for FY 2007–2011	376,198	330,119	459,478	306,424	296,294	299,091
Scenario II						
Above Target FY 2008-2011			590,128	420,947	485,589	441,956

Note: Beginning in FY 2007, excludes funding for Federal staff such as Technicians, Engineers, and Scientists working in support of in-house coal research and development, transferred to Other Fossil Energy ($14,537,000 in FY 2007) (see Exhibit 5).

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

As a result of the evaluations under the Research and Development Investment Criteria, as well as the Program Assessment Rating Tool, program activities throughout Fossil Energy have been focused on emphasizing research and development activities that support FutureGen as FE R&D's highest priority.

With respect to the GPRA unit, the budget is representative of the highest priority being assigned to FE R&D (including FutureGen) necessary to achieve the goal of cost-effective near-zero atmospheric emissions from coal in both the power sector and eventually in the transportation sector through the production of hydrogen from coal. The assumption is that successful and timely achievement of the FE R&D objectives is tied to the availability of technologies for integration into FutureGen, while also having application to reduced-emissions gasification power plants with limited or no carbon capture. These technologies are aimed at improving efficiency, achieving dramatically reduced atmospheric emissions for criteria pollutants, cost-effective capture and storage of carbon dioxide. In addition the establishment of validation methodologies to show permanence and measurement and mitigation technologies is an important part of the research. The focus on achieving near-zero atmospheric emissions is consistent with the guidance of the R&D Investment Criteria, which direct government support of R&D towards high risk (from the stand point of achieving technical feasibility and economic viability), high potential pay off activities. The approach also assumes a later issuance of the next round of the CCPI until additional funds are accumulated including available carry over funds from clean coal projects that may not go forward.

Reallocations to Support Priorities:

Funding priorities reflect prioritization of research aimed at achieving viable near-zero atmospheric emissions coal energy systems as represented by FutureGen and the supporting research. FutureGen will validate examples of technologies that future CCPI solicitations might include e.g., advanced integrated gasification combined cycle related technologies. The budget priorities reflect a stretch out of the issuance of the next round of CCPI solicitation until additional funds are accumulated including available carry over funds from clean coal project that may not go forward.

FUNDING SCENARIO II – ABOVE TARGET

Fiscal Year 2007 will remain constant in Scenario I. FY 2008 through FY 2011 increases are aimed at enhancing operations above the level in the FY 2007 appropriation.

Priorities and Assumptions:

With respect to the GPRA unit, the budget is representative of the funding for an enhanced program for addressing high priority research associated with near zero-emissions coal i.e. FutureGen and the supporting research. It also provides outyear funding towards CCPI demonstration of advanced coal technologies, contingent upon improvement of use of funds already provided for projects. The Above Target Scenario represents a reduced risk relative to the target level from the standpoint of achieving technical feasibility and economic viability, for achieving near-zero atmospheric emissions. This scenario would reduce the risk for near-zero atmospheric emissions through the enhanced development of Integrated Gasification Combined Cycle technologies. The budget associated with this approach focuses the resources on a broader research portfolio of technologies options within the timeframe for consideration in FutureGen, and provides for the development of technologies that could reduce both technical and economic risk. It also allows for the addition of new funds for CCPI.

Program Goal 04.55, Near-Zero Atmospheric Emissions Coal-Based Electricity and Hydrogen Production is made up of FutureGen, CCPI, Integrated Gasification Combined Cycle, Turbines, Sequestration, Fuels, and Distributed Generation Systems. These subprograms have specific performance targets and milestones based on the two funding scenarios. Exhibit 4 shows the annual targets for each of the subprograms given Scenario I – Target.

Exhibit 4. Performance Targets for Funding Scenario I – Base Target for Program Goal 04.55 Near-Zero Atmospheric Emissions Coal-Based Electricity and Hydrogen Production

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
CCPI				
Award CCPI-2 projects based on decisions made in FY 2006. Site selection for FutureGen.	Initiate long-lead procurement of hardware for FutureGen.	Complete design for FutureGen and initiate construction.	Delivery of hardware.	Complete FutureGen base facility construction and installation of major hardware.
Central Systems				
Validate technology improvements for mercury capture technology that translate to 50-75% capture at 75% of the 2003 cost of conventional technology of $50,000-$70,000 per pound of mercury captured. Validate technology improvements in gas cleanup, air separation, gasifier, and turbine technology that translate to a system with 42% efficiency at a capital cost of $1200/kW and progress toward the 2010 goal of an advanced coal-based power system capable of achieving 45-50% efficiency at a capital cost of $1000/kW or less.	Validated technology improvements for mercury capture technology that translate to 90% capture at 90% the 2003 cost of conventional technology of $50,000 – 70,000 per pound of mercury captured. Validated technology improvements in gas cleanup, air separation, gasifier, and turbine technology that translate to a system with 43% efficiency at a capital cost of $1150/kW and progress toward the 2010 goal of an advanced coal-based power system capable of achieving 45-50% efficiency at a capital cost of $1000/kW or less.	Validated technology improvements for mercury capture technology that translate to 90% capture at 75% the 2003 cost of conventional technology of $50,000 – 70,000 per pound of mercury captured. Validated technology improvements in gas cleanup, air separation, gasifier, and turbine technology that translate to a system with 44% efficiency at a capital cost of $1100/kW and progress toward the 2010 goal of an advanced coal-based power system capable of achieving 45-50% efficiency at a capital cost of $1000/kW or less.	Technology improvements for mercury capture technology capable of 90% capture at 75% the 2003 cost of conventional technology of $50,000 – 70,000 per pound of mercury captured, ready for demonstration. Validated technology improvements in gas cleanup, air separation, gasifier, and turbine technology that translate to a system with 45% efficiency at a capital cost of $1000/kW	Validate technology improvements for mercury capture, applicable to bituminous and low rank coals, for retrofit to conventional boilers and advanced coal utilization systems for power generation, capable of 90% capture at 50% of the 2003 cost of conventional technology of $50,000 – 70,000 per pound of mercury captured Develop an optimized IGCC power plant design that utilizes novel H2/CO membrane based separation technologies, integrated with a high-H2 gas turbine and provides for a 25% reduction in the produced cost of the hydrogen compared to conventional systems.
Sequestration				
Validate technology improvements	Validate technology improvements	Validate technology improvements	Validate technology improvements	Validate technology improvements

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
on carbon capture technology that can be extrapolated and translate to 90% capture at a cost of electricity increase of 20% when compared to an equivalent state-of-the-art non-sequestered plant.	on carbon capture technology that can be extrapolated translate to 90% capture at a cost of electricity increase of 19 percent when compare to an equivalent state-of-the-art non-sequestered plant.	on carbon capture technology that can be extrapolated translate to 90% capture at a cost of electricity increase of 17 percent when compare to an equivalent state-of-the-art non-sequestered plant.	on carbon capture technology that can be extrapolated translate to 90% capture at a cost of electricity increase of 15 percent when compare to an equivalent state-of-the-art non-sequestered plant.	on carbon capture technology that can be extrapolated translate to 90% capture at a cost of electricity increase of 13 percent when compare to an equivalent state-of-the-art non-sequestered plant.
Fuels				
Develop industry standards for the design and operation of a scale-up reactor for simultaneous production of additional hydrogen and its separation in accordance with the standards and requirements in the RD&D plan, and conduct initial tests of a prototype unit to validate design parameters.	Develop industry standards for the design and operation of a scale-up reactor for an advanced process intensification concept that will greatly simplify the production of hydrogen and its separation from the gasifier effluent including carbon dioxide in accordance to the standards and requirements in the RD&D plan.	Complete initial evaluation and testing of hydrogen/ hydrogen-methane mixture transport for the coal-based central production pathway and define additional research required for this integrated pathway to meet the established cost targets defined in the Hydrogen Posture Plan and Hydrogen from Coal R, D & D plan.	Complete testing of pre-engineering prototype hydrogen membrane separation unit or advanced membrane reactor module to validate design parameters in accordance to the standards and requirements in the RD&D plan and initiate the design of the engineering scale hydrogen separation module for near commercial verification testing. Demonstrate 0.9 $/kg cost for coal gasification combined cycle hydrogen production modules in a co-production facility (separation and water-gas shift).	Complete the design of the engineering scale hydrogen separation module or advanced membrane reactor module for near commercial verification testing. Initiate construction of the module for testing at selected host site.
Distributed Generation Systems				
Validate technology improvements to the SEA fuel cell stack that reduce projected stack manufacturing cost to at least $250/kW	Validate technology improvements to the SECA fuel cell stack that reduce projected stack manufacturing costs to at least $225/kW	Validate technology improvements to the SECA fuel cell stack that reduce projected stack manufacturing costs to at least $165/kW	One industry team to validate technology improvements to the SECA fuel cell stack that reduce projected stack manufacturing costs to at least $100/kW	Second industry team to validate technology improvements to the SECA fuel cell stack that reduce projected stack manufacturing costs to at least $100/kW

Mission and Goals of Office of Fossil Energy Other Programs Not Subject to GPRA

In addition to the programs discussed above, the Office of Fossil Energy operates several programs that are not subject to GPRA measures due to their nominal funding and indirect or difficult to link relationship to primary mission, goals, and objectives reported in the GPRA measures. Federal Program Direction (which includes Federal in-house research), Plant and Capital Equipment, Environmental Restoration, and Advanced Metallurgical represent the major programs in this group. Exhibit 5 shows the aggregate straight line funding for these programs for FY07-11.

Exhibit 5. Other Fossil Energy R&D Programs' Five-Year Budget Authority Plan FY07-11

(dollars in thousands)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I						
Target (FY 2007–2011)	151,465	139,567	142,522	145,576	148,706	151,909
Scenario II						
Above Target (FY 2008-2011)			142,522	145,576	148,706	151,909

Note: Beginning in FY 2007, includes funding for Federal staff such as Technicians, Engineers, and Scientists working in support of in-house coal research and development, transferred from Near-Zero Atmospheric Emissions Coal-Based Electricity and Hydrogen Production ($14,537,000 in FY 2007) (see Exhibit 3).

FUNDING SCENARIO I- TARGET

Priorities and Assumptions:

Level funding at the target level.

Reallocations to Support Priorities:

None.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

Level funding at target level.

Reallocations to Support Priorities:

None.

Mission and Goals at the GPRA Unit: Program Goal 04.58.00.00, Petroleum Reserves

Petroleum Reserves GPRA Unit Program Goal 04.58 is made up of three subprograms – Strategic Petroleum Reserve (SPR), Northeast Home Heating Oil Reserve (NEHHOR), and the Naval Petroleum and Oil Shale Reserves (NPOSR). This multi-year plan individually addresses the priorities, assumptions and funding scenarios for these major programs.

The Strategic Petroleum Reserve supports the Department's mission to achieve energy security and to guard against energy emergencies by reducing the adverse economic impacts of supply disruptions. The Reserve serves as the cornerstone of the U.S. energy security program, with a prepared readiness to deploy at the President's direction in the event of an emergency. Exhibit 6 contains the near-term objectives address the outcome of energy and economic security against supply interruptions.

Exhibit 6. Performance Targets for Funding Scenario I –Target for Program Goal 04.58 Petroleum Reserves

Near-Term Objectives	Strategies	Key Performance Measures	5-Year Projection
Readiness to supply oil at a maximum sustained rate within 15 days notice by the President.	Maintain oil quality through degas processing. Provide effective drawdown and distribution systems within a secure environment. Provide the most cost-effective operations for the taxpayer.	Drawdown Rate	4.415 MMB/Day
		Monthly maintenance & availability goals	≥95%
		Degassed inventory	156 MMB by end of FY 2009.
		Operating cost per barrel of capacity	$0.204

Near-Term Objectives	Strategies	Key Performance Measures	5-Year Projection
Maximize SPR's current import protection level.	Maintain an effective partnership with DOI/MMS for oil transfers.	Crude Oil Inventory	700 MMB by end of 2006.

These near-term objectives are consistent with the Administration's policies set forth in the Department's 2003 Strategic Plan and the President's Directive to fill the SPR to 700 million barrels. Exhibit 7 shows two funding scenarios for Program 04.58, Strategic Petroleum Reserve –target and above target.

Exhibit 7. Program 04.58 Strategic Petroleum Reserve Budget Authority Plan FY07-11

(Dollars in thousands)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I						
Target for FY 2007–2011	207,340	155,430	150,000	149,000	147,000	149,000
Scenario II						
Above Target FY 2008-2011			164,037	166,843	180,122	179,847

PERFORMANCE TARGETS FOR FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

The Reserve's priority is to maintain its current 727 million barrel storage capacity with an operational readiness to draw down within 15 days notice by the President. This target level accommodates all SPR mission readiness activities and a reduced capital program. The capital program is vital to maintaining standby readiness levels.

Reallocations to Support Priorities:

Although operational readiness activities are funded, continuing a reduced capital program into the out years impacts site availability due to the progressive deterioration of facilities and equipment.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

This scenario includes increases to achieve/sustain defined performance capabilities. Projects in FY 2008 through FY 2011 consist of capital construction at all sites and movement of the degas plant from Bryan Mound to West Hackberry.

Reallocations to Support Priorities:

In spite of inflationary effects, the Reserve has consistently reduced costs over the past five years. This has been achieved through a multi-year cost reduction incentive with the Management and Operations contractor as well as the acquisition of crude oil through deferrals and the Royalty-in-Kind oil transfer program.

Funding at the Above Target level in the out years will ensure the monthly maintenance and accessibility goals are met as well as targeted operating cost per barrel of capacity.

Exhibit 8. Performance Targets for Funding Scenario I –Target for Program Goal 04.58 Strategic Petroleum Reserves

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Achieve maximum sustained (90 day) drawdown rate of 4.4 MMB. Achieve ≥ 95% of monthly maintenance and accessibility goals. Achieve operating cost per barrel of capacity of $0.201	Achieve maximum sustained (90 day) drawdown rate of 4.4 MMB.	Achieve maximum sustained (90 day) drawdown rate of 4.4 MMB.	Achieve maximum sustained (90 day) drawdown rate of 4.4 MMB.	Achieve maximum sustained (90 day) drawdown rate of 4.4 MMB.

Mission and Goals at the GPRA Unit: Program Goal 04.58.00.00, Northeast Home Heating Oil Reserve

The Northeast Home Heating Oil Reserve (NEHHOR) supports the Department's mission to guard against energy emergencies by providing a 2 million barrel reserve of home heating oil in the U.S. Northeast. Established in 2000, the Reserve is an "emergency buffer" that can supplement commercial fuel supplies should the heavily oil-dependent region be hit by a severe disruption in commercial heating oil supplies. The stability, or shelf life, of heating oil is such that it must be replaced annually. Therefore, the heating oil reserve must be co-mingled with commercial stocks held by companies already active in the heating oil business. This utilizes their first-in, first-out product rotation method and alleviates the need to dispose of and replace the two million barrel reserve in the event there are no major supply disruptions and the reserve remains static throughout the year.

Two million barrels would give Northeast consumers a cushion of supplies for about 10 days, the time required for ships to carry heating oil from the Gulf of Mexico to New York Harbor. Complete drawdown (including delivery) can be achieved within 12 days. The following Exhibit 9 reflects – target and above target.

Exhibit 9. Program 04.58 Northeast Home Heating Oil Reserve Budget Authority Plan FY07-11 **(Dollars in thousands)**

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I						
Target for FY 2007–2011	-	4,950	5,000	5,000	5,000	5,000
Scenario II						
Above Target FY 2008-2011			8,000	8,000	8,000	8,000

FUNDING SCENARIO I – TARGET

Priorities and Assumptions:

The Reserve's priority is to assure a home heating oil supply for the Northeast states during times of very low inventories and significant threats to immediate further supply. Should a fuel crisis develop, there is a rapid competitive sales process using an Internet-based online auction system. The majority of funding at the target level is consumed by the costs for the lease of commercial storage space. Current contracts expire in September 2007. Based on the significant increase in storage costs due to a shortage of available storage, it is anticipated that the target funding level will be insufficient to award follow-on contracts for the entire reserve.

Reallocations to Support Priorities:

The cost to operate, maintain, and provide security for government-owned facilities would be greater than our current approach of leasing co-mingled storage services from companies already receiving, storing, and issuing commercial heating oil. The only option for maintaining a reserve within this funding level is to reduce its size below the current 2 million barrel inventory. The ultimate size would be determined by the bids received in the spring of 2007.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

This scenario includes increases to accommodate the anticipated cost of commercial storage space when current contracts expire in 2007. The contracts awarded in 2002 equate to storage costs of approximately $2.50 per barrel. Due to the high levels of inventories in the Northeast, storage costs are anticipated to be approximately $4.00 per barrel.

Reallocations to Support Priorities:

The 5-year contracts negotiated in 2002 were awarded during a period of excess tankage available due to low inventories. Budget savings were utilized in FY2006 when the program was able to finance its operations without new budget authority.

Program Goal 04.58, Northeast Home Heating Oil has a specific performance target and milestone based on the two funding scenarios. Exhibit 10 shows the annual targets given Scenario I – Target.

Exhibit 10. Performance Targets for Funding Scenario I – Target for GPRA Unit 04.58, Northeast Home Heating Oil

FY 2007 Target	FY 2008 Target	FY 2009 Target	FY 2010 Target	FY 2011 Target
Complete drawdown within 12 days.	Complete drawdown within 12 days.	Complete drawdown within 12 days.	Complete drawdown within 12 days.	Complete drawdown within 12 days.

Mission and Goals at the GPRA Unit: Program Goal 04.58.00.00, Naval Petroleum and Oil Shale Reserves

The objectives of the Naval Petroleum and Oil Shale Reserves (NPR) program have evolved from the national defense purpose envisioned in the early 1900s to 1) Ensuring completion of environmental remediation, cultural resource activities, equity determination, and school lands compensation required as a result of the Elk Hills sale agreements; and 2) Supporting the Administration's goal to develop new/alternative energy sources and energy efficiency technologies. Exhibit 11 shows the strategies and performance measures to achieve these objectives.

Exhibit 11. Performance Targets for Funding Scenario I – Target for GPRA Unit 04.58, Naval Petroleum and Oil Shale Reserves

Objectives	Strategies	Key Performance Measures
Finalize Elk Hills equity interests with Chevron Texaco.	Support ASFE in decision making.	
Closeout remaining environmental findings at NPR-1.	Work to close the remaining environmental findings, as required by the agreement between the Department and the California Department of Toxic Substance Control (DTSC).	Complete Risk Assessments and Corrective Action Studies by FY 2009.
Operate Naval Petroleum Reserve 3 to the end of its economic life in an environmentally sound manner.	Increase economically recoverable reserves with minimum or no environmental impact.	

Exhibit 12 shows the target and above target.

Exhibit 12. Program 04.58 Naval Petroleum and Oil Shale Reserves Authority Plan FY07-11

(Dollars in thousands)

	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Scenario I Target for FY 2007–2011	21,285	18,810	18,000	18,000	18,000	18,000
Scenario II Above Target FY 2008-2011			18,500	18,500	18,500	18,500

FUNDING SCENARIO I- TARGET

Priorities and Assumptions:

Priorities include NPR-1 post-sale activities related to environmental remediation as directed by the State of California and settlement of ownership equity shares with the former unit partner in the field, Chevron U.S.A., Inc. NPR-3 will continue to apply conventional oil field management and operations to produce this stripper field. Co-located with NPR-3, the Rocky Mountain Oilfield Testing Center (RMOTC) provides opportunities for field testing and demonstration of upstream and environmental products. This level of funding continues environmental remediation and equity determination activities at NPR-1, but reduces preventative maintenance and operations support at NPR-3 and demonstration projects at RMOTC.

Reallocations to Support Priorities:

There are no reallocations available to offset requirements.

FUNDING SCENARIO II – ABOVE TARGET

Priorities and Assumptions:

This scenario includes increases to support continued equity determination activities.

Reallocations to Support Priorities:

None

Office of Civilian Radioactive Waste Management
Five Year Plan
FY 2007 – FY 2011

OVERVIEW:

The mission of the Office of Civilian Radioactive Waste Management (OCRWM) is to manage and dispose of high-level radioactive waste and spent nuclear fuel in a manner that protects the public's health, safety, and the environment; enhances national and energy security; and merits public confidence. This responsibility is critical to national and homeland security, and for the future of the Nation's electric energy supply. The Federal responsibility for development of a geologic repository for the disposition of high-level radioactive waste materials is also necessary for nuclear non-proliferation and protecting our environment. The mission of this Program is vital to meeting the future energy needs of the Nation, and to keep the United States competitive in the global economy.

The Nation's commercial and defense high-level radioactive waste must be safely isolated to minimize the risk to human health and the environment. Disposition of these materials in a geologic repository is necessary to maintain our energy options and remain competitive in the global economy, for national security, to support a cleanup of our weapons sites, to continue operation of the U.S. Navy's nuclear-powered vessels, and to advance our international non-proliferation goals. Ultimately, the success of the project ensures the consolidation of nuclear materials currently located at 122 temporary storage sites in 39 states within 75 miles of nearly 162 million Americans and nearly every major waterway, at a remote site.

The Target funding levels in years 2007 through 2011 will slow the project's path forward for the opening of the repository. A program will be pursued to support program priorities in the order listed: preparation of license application and license defense; acquisition of cask and rolling stock, and site infrastructure. The Above Target Funding Scenario will permit OCRWM to achieve greater progress in developing a permanent repository and waste acceptance capabilities for spent nuclear fuel and high level radioactive waste, including the Nevada rail line.

Mission and Goal

The Program will implement the following means to achieve the Program Goal: resources will be applied in priority order to license development and defense, design activities, transportation and repository infrastructure readiness to support the start of repository operations, and development of a strong nuclear safety culture. Project management skills will be upgraded, a comprehensive workforce plan will be implemented to ensure human resources align with the evolving program, and information technology will be utilized to manage and optimize documentation and interactions during licensing. Fiscal years 2006 and 2007 are a critical juncture for the Department of Energy's Yucca Mountain Project. While the project did not meet its objective of submitting a license application in 2004, investments on four broad fronts in FY 2007 are required for the project to be able to dispose of the statutory maximum of 70,000 metric tons of spent nuclear fuel (SNF) and high-level waste (HLW). Progress on these fronts will allow DOE to:

- Develop a license application for submittal to the Nuclear Regulatory Commission (NRC) based on a safer and simpler approach to handling SNF and operating the repository, otherwise known as the clean and canistered approach. Development and subsequent approval of the license will give the Department the authorization to construct the Yucca Mountain Repository and dispose of waste.

- Take action to improve a decaying site infrastructure to ensure worker safety. A lack of near-term action will result in safety issues.

- Develop the transportation infrastructure necessary to safely and securely move the waste from where it is today to the repository for disposal. There are many long-lead procurements to complete before the Department is capable of shipping the waste.

- Develop the culture expected of an NRC licensee in which the organization's values and behaviors serve to make nuclear safety the overriding priority, consistent with the Institute of Nuclear Power Operations and NRC guidance.

OCRWM intends to present its project plans and conceptual design report for the clean canistered approach to the DOE Acquisition Executive/Deputy Secretary for approval in the spring of 2006. Following that Critical Decision 1 process, OCRWM will be in a position to provide a schedule for license application submittal to the NRC.

[1]Civilian Radioactive Waste Management Funding Plan

B/A (dollars in thousands)

	FY 2006 Approp.	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Target	495,000	544,500	526,000	523,000	516,000	522,000
Above Target	495,000	544,500	661,000	963,000	1,070,000	975,000

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB's computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.

FUNDING - TARGET LEVEL

Priorities and Assumptions:

In managing the Yucca Mountain Project, resources will be applied in priority order to license development and defense, design activities, repository infrastructure readiness to support the start of repository operations, and development of a licensing culture. An assumption is that the initial operating capability for the repository occurs beyond 2015. DOE will acquire limited capability to transport spent nuclear fuel and high level radioactive waste. Construction of the Nevada rail link begins after 2011.

PRIORITIES:

- Develop the License Application to reflect the current plan for handling primarily canistered SNF. Respond to NRC requests for additional information and support the licensing hearing process
- Recertify License Support Network.
- Complete the development of subsystem models and the Total System Performance Assessment (TSPA) to incorporate the canistered approach.
- Conduct Environmental Assessments to support infrastructure development.
- Conduct highest priority repository design activities related to facilities required for initial repository operations.
- Complete safety upgrades for highest priority infrastructure improvement needs.
- Consistent with the Institute of Nuclear Power Operations' Principles of a Strong Nuclear Safety Culture and NRC's Regulatory Guidance on Establishing and Maintaining a Safety Conscious Work Environment, enhance efforts to develop a culture expected of an NRC licensee in which the organization's values and behaviors serve to make nuclear safety the overriding priority.
- Commence procurement of casks with existing certificates of compliance.
- Identify and initiate procurement of auxiliary and cask handling equipment.
- Lease rail rolling stock.
- Continue funding for States and Tribes under the NWPA Section 180(c).

Reallocation to Support OCRWM Priorities:

Repository design activities will focus on the facilities required for initial repository operations. Work will proceed on completion of a robust TSPA, and on higher priority site safety upgrades and infrastructure improvements. The program will begin procurement of casks with existing NRC certificates of compliance only.

Slower development of the design for the clean and canistered approach for the repository operations will delay submittal of license application to the NRC for authorization of construction and repository operations. The pace of improvements to decaying site infrastructure will affect our construction schedule.

The Nevada Rail Line design and construction will be postponed within the timeframe of the Plan. Initial transportation capability to service DOE and commercial sites until rail construction is funded would be by legal and overweight trucks, both nationally, and in the State of Nevada. Use of heavy haul trucks within the State of Nevada would require upgrades to the existing road infrastructure, and this scenario does not provide funding for those upgrades. The system acceptance rates will be limited by repository facility acceptance capability, not by transportation constraints. Rolling stock will not comply with the Association of American Railroads Standard S-2043, which will complicate rail service negotiations. Funding for information and outreach activities and planned rail training programs would focus on work along a few corridors for early shipments.

FUNDING – ABOVE TARGET LEVEL

Priorities and Assumptions:

The Program is assuming the passage of legislation allowing annual utility receipts paid to the Nuclear Waste Fund to be utilized for project costs up to the amount of annual appropriations. The design and licensing of the geologic repository, with emphasis on achieving limited initial operating capacity and developing site and transportation infrastructure would have the highest priorities.

PRIORITIES:

- Complete repository facilities preliminary design for a less complex and safer system that utilizes transport, aging and disposal (TAD) canister technology
- Complete total system performance assessment modeling to accommodate all projected waste, and address all outstanding issues
- Complete licensing documentation for NRC that envisions phased approach to operations, and prepare for a vigorous license defense
- Proceed with acquisition of transportation infrastructure (casks and rolling stock)
- Construction of Nevada rail line to support initial commercial fuel receipt operations and repository construction
- Fully upgrade repository site infrastructure to ensure safety of workers, visitors and regulators
- Ensure adoption of strong nuclear safety culture throughout program, and strengthen quality assurance and independent university-based review capabilities
- Pursue promising technologies, most notably Structurally Amorphous Metal application for the longevity of the waste packages

Reallocation to Support OCRWM Priorities

Reallocations from long lead cask acquisitions and from program management and integration funds would be reallocated to support the priorities under the Above Target scenario.

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
Performance Targets (At Target Funding)

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Yucca Mountain/Repository Design & Licensing (Phase 2A)				
Complete development of design and safety documentation to complete a License Application. Complete LSN Recertification	Respond to requests from the Nuclear Regulatory Commission (NRC) for additional information relative to the License Application (LA) by the established deadlines.	Complete detailed design of the Fuel Handling Facility.	Complete model abstractions and Analysis Model Reports for TSPA Receive and Possess.	Update events sequence and consequence evaluation for Post-Closure Safety Analysis for Receive and Possess.
Transportation/ National and Nevada				
Issue a Record of Decision identifying the alignment on which the railroad may be built.	RFP for DOE cask overpacks. Issue NWPA Section 180 (c) grants	RFP for truck cask certification RFP for escort car prototype	RFP for occasional services contract	Operational readiness review Full scale emergency

OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
Performance Targets (At Target Funding)

FY 2007 Targets	FY 2008 Targets	FY 2009 Targets	FY 2010 Targets	FY 2011 Targets
Yucca Mountain/Repository Design & Licensing (Phase 2A)				
Complete development of design and safety documentation to complete a License Application.	Respond to requests from the Nuclear Regulatory Commission (NRC) for additional information relative to the License Application (LA) by the established deadlines.	Complete detailed design of the Fuel Handling Facility.	Complete model abstractions and Analysis Model Reports for TSPA Receive and Possess.	Update events sequence and consequence evaluation for Post-Closure Safety Analysis for Receive and Possess.
Complete LSN Recertification.	Upgrade full range of site infrastructure.	Complete upgrade of site infrastructure.		
Transportation/ National and Nevada				
Issue a Record of Decision identifying the alignment on which the railroad may be built.	RFP for DOE cask overpacks. Issue NWPA Section 180 (c) grants	RFP for truck cask certification RFP for escort car prototype.	RFP for occasional services contract.	Operational readiness review Full scale emergency.
	RFP for Nevada Rail Line Design and Build Contract	Begin Construction of Nevada Rail Line.		Award Cask fabrication contract for 20 rail and 10 truck casks.
			Nevada Rail line construction 20% complete.	Nevada Rail line construction 60% complete.

NATIONAL NUCLEAR SECURITY ADMINISTRATION
Five Year Plan
FY 2007 – FY 2011

The twenty-two NNSA GPRA units collectively support three fundamental national security missions:

- Assure the safety and reliability of the U.S. nuclear weapons stockpile while at the same time transforming that stockpile and the infrastructure that supports it;
- Reduce the threat posed by nuclear proliferation; and
- Provide reliable and safe nuclear reactor propulsion systems for the U.S. Navy.

REQUIREMENT FOR FUTURE YEARS NUCLEAR SECURITY PROGRAM (FYNSP)

Section 3253 of P.L. 106-065 requires the NNSA to submit to the Congress the estimated expenditures necessary to support the programs, projects and activities of the NNSA for a five year period, at a level comparable to that contained in the budget. This information is included within NNSA's "mainline" budget, and is comprised of five-year funding estimates and program performance metrics at the program and project level.

INTEGRATING THE NNSA PROGRAM

The NNSA uses a disciplined multi-year planning, programming, and budgeting process to assure taxpayers that the programs supporting these missions meet program goals, and are integrated and cost effective. Each year, long-term performance goals are established and/or revalidated during the Planning phase and linked in a performance cascade to annual targets and detailed milestones. During the Programming phase, program and resource tradeoff decisions are evaluated within the NNSA's five-year funding targets based on the impact to annual and long-term performance measures. The Administrator's program decisions are documented and used to develop the updated budget request to the Office of Management and Budget and the Congress during the Budgeting phase. Program and financial performance for each measure is monitored monthly and progress verified during the Execution and Evaluation phases of the NNSA process.

NUCLEAR WEAPONS PROGRAMS

The FY2007-2011 program request places a high priority on accomplishing the near-term workload and supporting technologies for stockpile stewardship, along with the long-term science and technology investments to ensure the capability and capacity to support ongoing missions. The NNSA is accelerating efforts for warhead dismantlement and consolidation of special nuclear materials across the nuclear weapons complex. It is also essential to maintain the scientific and technical efforts and capabilities for assessment, certification, maintenance and life extension of the stockpile. This has allowed NNSA to move forward in "science-based" stockpile stewardship that relies on cutting-edge experiments and analysis, including extensive laboratory and flight tests of warhead components and subsystems.

To assure our ability to maintain essential military capabilities over the long term, while enabling deeper cuts in the stockpile through reduction of reserve warheads, the NNSA is moving towards a "responsive nuclear weapons infrastructure", as called for in the Nuclear Posture Review (NPR). The

Department is realizing its vision for a transformed nuclear weapon stockpile and infrastructure, which are enabled by the Reliable Replacement Warhead Program and the initiative for a responsive infrastructure.

In the FY2007-2011 timeframe, NNSA made decisions to better balance the need for facility operations and infrastructure recapitalization programs with construction of new facilities to enable NNSA to move toward a more supportable and responsive infrastructure. Directed Stockpile Workload continues to increase and needed resources have been rebalanced from the efforts in the scientific and technical campaigns. Additional materials consolidation initiatives are in the planning stage and are expected at the end of the five-year period.

Securing our people, our nuclear weapons and weapons-usable materials, our information, and our infrastructure from harm, theft or compromise is one of the highest priorities for the NNSA. The FY 2007-2011 budget decisions redeployed resources to ensure continued upgrade of protective forces weapons, training and equipment; hardening storage structures; improving early detection and assessment of intrusion; consolidating nuclear material; and installing additional delay mechanisms and barriers around critical facilities in order to protect our facilities against a continually evolving threat.

NON-PROLIFERATION AND THREAT REDUCTION PROGRAMS

Acquisition of nuclear weapons, WMD capabilities, technologies, and expertise by rogue states or terrorists is a grave threat to the United States and international security. NNSA's nonproliferation and threat reduction programs are structured around a comprehensive and multi-layered approach to threat reduction and nuclear nonproliferation. These programs demonstrate the President's commitment to prevent, contain, and roll back the proliferation of the nuclear weapons-usable materials, technology, and know-how. The NNSA works with more than 70 countries to secure dangerous nuclear and radioactive materials, halt the production of new fissile material, detect the illegal trafficking or diversion of nuclear material, and ultimately destroy surplus weapons-usable materials, and with multilateral organizations such as the International Atomic Energy Agency and the Nuclear Suppliers Group (NSG) to further strengthen nuclear safeguards and improve the nuclear export control regulatory infrastructure in other countries. This multi-layered approach is intended to identify and address potential vulnerabilities within the nonproliferation regime, reduce the incentive for terrorists and rogue states to obtain WMD, and limit terrorists' access to these deadly weapons and materials.

In the FY 2007-2011 budget, decisions were made to assure that the Elimination of Weapons Grade Plutonium Production projects, now in the construction phase, continued apace, and that new initiatives in Global Threat Reduction were fully funded. Some program efforts that have been heavily funded in the past five years are drawing near to completion, including parts of the International Materials Protection, Control and Cooperation program, and these resources will be redeployed to other areas where program activity is increasing.

NAVAL REACTORS PROGRAM

The Naval Reactors program mission is to provide the U.S. Navy with safe, militarily effective nuclear propulsion plants and ensure their continued safe, reliable and long-lived operation. Nuclear propulsion plays an essential role in ensuring the "forward presence" of the Navy around world to respond anywhere America's interests are threatened. The program has a broad mandate, maintaining responsibility for nuclear propulsion from cradle to grave. Over forty percent of the Navy's major combatants are nuclear-powered, including aircraft carriers, attack submarines, and strategic submarines, which provide the nation's most survivable element of the nuclear deterrent.

For the FY 2007-2011 period, the Naval Reactors efforts are relatively stable. Some additional outyear efforts associated with remediation of program sites can be expected.

[1]NNSA Funding Plan

($ in 000)	FY 2007 Congressional Request	FY 2008	FY 2009	FY 2010	FY 2011
National Nuclear Security Administration					
Weapons	$ 6,407,889	$ 6,536,000	$ 6,667,000	$ 6,800,000	$ 6,936,000
Defense Nuclear Nonproliferation	$ 1,726,213	$ 1,761,000	$ 1,796,000	$ 1,832,000	$ 1,869,000
Naval Reactors	$ 795,133	$ 811,000	$ 827,000	$ 844,000	$ 861,000
Office of the Administrator	$ 386,576	$ 394,000	$ 402,000	$ 410,000	$ 418,000
Total	$ 9,315,811	$ 9,502,000	$ 9,692,000	$ 9,886,000	$ 10,084,000

1 The Administration determines the details of its appropriations request one year at a time. Each year, the Administration works to develop the detailed estimates for the budget year for individual programs. Before the Budget is printed, OMB computer generates amounts for the out-years (FY 2008-2011) by account that hit overall targets for defense, homeland security, and non-security spending, so that the Administration can calculate the deficit path. These mechanistic, computer-generated account data for the out-years do not represent the President's proposed levels for these individual agencies, accounts, or programs. The FY 2008 and subsequent years' requests will be made in the future. As a result, the out year numbers represent placeholders, pending budget decisions in future years.