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CRS Report for Congress

Energy and Water Development: FY2009 Appropriations

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The annual consideration of appropriations bills (regular, continuing, and supplemental) by Congress is part of a complex set of budget processes that also encompasses the consideration of budget resolutions, revenue and debt-limit legislation, other spending measures, and reconciliation bills. In addition, the operation of programs and the spending of appropriated funds are subject to constraints established in authorizing statutes. Congressional action on the budget for a fiscal year usually begins following the submission of the President's budget at the beginning of the session. Congressional practices governing the consideration of appropriations and other budgetary measures are rooted in the Constitution, the standing rules of the House and Senate, and statutes, such as the Congressional Budget and Impoundment Control Act of 1974.

This report is a guide to the regular appropriations bills that Congress considers each year. It is designed to supplement the information provided by the House and Senate Appropriations Subcommittees on Energy and Water Development. It summarizes the status of the bill, its scope, major issues, funding levels, and related congressional activity, and is updated as events warrant. The report lists the key CRS staff relevant to the issues covered and related CRS products.

NOTE: A Web version of this document with active links is available to congressional staff at [http://beta.crs.gov/cli/level_2.aspx?PRDS_CLI_ITEM_ID=73].

Energy and Water Development: FY2009 Appropriations

Summary

The Energy and Water Development appropriations bill provides funding for civil works projects of the Army Corps of Engineers (Corps), the Department of the Interior's Bureau of Reclamation (BOR), the Department of Energy (DOE), and a number of independent agencies.

Key budgetary issues involving these programs include

- the distribution of Army Corps of Engineers appropriations across the agency's authorized construction and maintenance activities (Title I);
- support of major ecosystem restoration initiatives, such as Florida Everglades (Title I) and California "Bay-Delta" (CALFED) (Title II);
- a proposal by the Bush Administration to eliminate funding for DOE's Weatherization program for low income homes (Title III, Energy Efficiency and Renewable Energy);
- the Administration's request for funding of DOE's Reliable Replacement Warhead (RRW) nuclear weapons program, which Congress declined to fund for FY2008 (Title III, Nuclear Weapons Stockpile Stewardship);
- funding for the proposed national nuclear waste repository at Yucca Mountain, Nevada (Title III: Nuclear Waste Disposal); and
- the Administration's proposed Global Nuclear Energy Partnership to supply plutonium-based fuel to other nations (Title III: Nuclear Energy).

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Division abbreviations: RSI = Resources, Science, and Industry; FDT = Foreign Affairs, Defense, and Trade; KSG = Knowledge Services Group.

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Most Recent Developments

The Administration's request for funding Energy and Water Development programs for FY2009, submitted in February 2008, totaled $30.932 billion, compared to $30.853 billion appropriated for FY2008.

Status

Table 1. Status of Energy and Water Development Appropriations, FY2009

Subcommittee Markup		House Report	House Passage	Senate Report	Senate Passage	Conf. Report	Final Approval		Public Law
House	Senate						House	Senate	

As **Table 1** indicates, neither the House nor the Senate appropriations subcommittees have marked up the FY2009 Energy and Water Development bill. Later updates of this report will indicate changes in status of the bill.

Overview

The Energy and Water Development bill includes funding for civil works projects of the U.S. Army Corps of Engineers (Corps), the Department of the Interior's Central Utah Project (CUP) and Bureau of Reclamation (BOR), the Department of Energy (DOE), and a number of independent agencies, including the Nuclear Regulatory Commission (NRC) and the Appalachian Regional Commission (ARC).

Table 2 includes budget totals for energy and water development appropriations enacted for FY2002 to FY2009.

Table 2. Energy and Water Development Appropriations, FY2002 to FY2009

(budget authority in billions of current dollars)

FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09[c]
25.2	26.1	26.7	30.2[a]	36.7[b]	29.4	30.9	30.9

Note: Figures represent current dollars, exclude permanent budget authorities, and reflect rescissions.

a. For FY2005 and later, total includes DOE programs formerly funded in the Interior and Related Agencies appropriations bill and transferred to the Energy and Water Development appropriations bill.
b. Includes $6.6 billion in emergency funding for the Corps of Engineers.
c. Requested.

Table 3 lists totals for each of the bill's four titles. It also lists several "scorekeeping" adjustments of accounts within the four titles, reflecting various expenditures or sources of revenue besides appropriated funds. These adjustments affect the total amount appropriated in the bill but are not included in the totals of the individual titles.

Table 3. Energy and Water Development Appropriations Summary

($ millions)

Title	FY2008	FY2009 Request	House	Senate	Final
Title I: Corps of Engineers	$5,587.1	$4,741.0			
Title II: CUP & BOR	1,150.9	961.3			
Title III: Department of Energy	24,378.0	25,514.9			
Title IV: Independent Agencies	281.3	263.5			
E&W Subtotal	**31,397.3**	**31,480.7**			
Scorekeeping Adjustments					
Title II					
Central Valley	(51.3)	(48.3)			
Title III					
Uranium Fund	(458.8)	(463.0)			
Excess Fees FERC	(34.4)	(36.9)			
E&W Total	**30,852.8**	**30,932.5**			

Source: Administration FY2009 budget request.
Note: Details may not add to totals due to rounding.

Tables 4 through **17** provide budget details for Title I (Corps of Engineers), Title II (Department of the Interior), Title III (Department of Energy), and Title IV (independent agencies) for FY2008-FY2009. Accompanying these tables is a discussion of the key issues involved in the major programs in the four titles.

Title I: Army Corps of Engineers

The President requested $4.741 billion for the U.S. Army Corps of Engineers civil works activities; it was less than the budget request of $4.871 billion for FY2008 and an 18% decrease from the $5.586 billion in FY2008 enacted appropriations. Funding for the Corps' civil works program is often a contentious issue between the Administration and Congress, with final appropriations typically providing more funding than requested, regardless of which political party controls the White House and Congress. Generally around 85% of the appropriations for the agency is directed to specific projects. Often Congress will direct funding to projects not included in the Administration's request. Consequently, the agency's funding is often part of the debate over earmarks and congressionally requested items.

Table 4. Energy and Water Development Appropriations Title I: Army Corps of Engineers

($ millions)

Program	FY2008	FY2009 Request[b]	House	Senate	Conf.
Investigations and Planning	$167.2	$91.0			
Construction	2,289.3	1,402.0			
Mississippi River & Tributaries	387.4	240.0			
Operation and Maintenance (O&M)	2,243.6	2,475.0			
Regulatory	180.0	180.0			
General Expenses	175.0	177.0			
FUSRAP[a]	140.0	130.0			
Flood Control and Coastal Emergencies	0.0	40.0			
Office of the Asst. Secretary of the Army	4.5	6.0			
Total Title I	**5,587.1**	**4,741.0**			

Sources: FY2009 Budget Request.

a. "Formerly Utilized Sites Remedial Action Program."

b. The FY2009 request reflects a transfer of certain activities from the Corps construction account to its O&M account.

Key Policy Issues — Corps of Engineers

Hurricane Katrina Repairs and Coastal Louisiana Restoration. The Corps is responsible for much of the repair and fortification of the hurricane protection system of coastal Louisiana, particularly in the greater New Orleans area; to date, most of the Corps' work on the region's hurricane protection system has been funded through $7 billion in emergency supplemental appropriations, not through the annual appropriations process. The Administration anticipates that these funds will be used by the end of FY2008, but that much remaining work is required to reduce the hurricane flooding risk to the New Orleans area to a 100-year level of protection

(i.e., 1% probability of flooding in any given year) and to restore and complete hurricane protection in surrounding areas to previously authorized levels of protection by 2011. The Administration included in its FY2009 budget a request for $5.761 in emergency supplemental funds to complete these construction activities and for related purposes. The request said the $7 billion in previously appropriated funds are insufficient to complete these activities because of increased costs, improved data on costs, and other factors. As proposed by the Administration, the state cost-share for these construction activities would be roughly $1.3 billion.

The Administration also proposed as part of its FY2009 budget request legislative language to consolidate the authorities for the Corps hurricane protection projects in the New Orleans area into a single project. Consolidation would allow for the hurricane protection activities funding to be managed systematically, rather than on a project-by-project basis.

Project Backlog and Performance Budgeting. The policy debate on how to structure the Corps' budget and priorities is ongoing. The Corps civil works program has been criticized by some observers as an agglomeration of projects with no underlying design. These observers see the Corps' backlog of authorized activities as a symptom of this lack of priority setting. Prior to enactment of the $23 billion authorization bill for the agency known as the Water Resources Development Act (WRDA) in November 2007, estimates of the backlog's size had varied from $11 billion to more than $60 billion, depending on which projects are included. Although some observers view the backlog as the Corps' "to do" list, others are concerned that projects face construction delays and related cost overruns as appropriations are spread across an increasing portfolio of projects.

The Corps' backlog of authorized projects and concerns about the fiscal planning and management of the agency's portfolio contribute to support for the Administration's performance-based criteria for structuring the agency's budget. Critics argue that the performance-based criteria are too simplistic and as a result the President's request ignores the need to invest in other authorized, cost-beneficial projects. The critics also contend that basing the Corps' budget on these criteria does not produce an integrated multiyear program for the agency. The Corps is expected to release a five-year development plan before Summer 2008.

Performance-Based Budgeting. The Administration performance-based budgeting approach consists of requesting construction and maintenance funds for projects based on their economic and environmental returns and their protection of human safety. The construction projects selected for funding were chosen largely on their having either a high ratio of monetary benefits to costs, or, for environmental projects, a high cost-effectiveness. The FY2009 budget request continued the Administration's movement toward presenting the agency's budget according to "business lines" (e.g., navigation, flood control, recreation, hydropower). For example, of the $4.741 billion budget request, $1.900 billion (40%) is for commercial navigation, $1.314 billion (28%) is for flood and coastal storm damage reduction, and $286 million (6%) and $95 million (2%) are for the agency's relatively new roles in aquatic ecosystem restoration and environmental stewardship, respectively. The agency's regulatory responsibilities represent $180 million, 4% of the agency's budget.

To address the backlog of authorized Corps activities, the Administration's request limited the number of new activities started to only two planning activities. The President's request would fund 79 construction projects, of which 12 are anticipated to be completed in FY2009.

Operation and Maintenance (O&M) Budgeting. Unlike previous budget requests, the FY2009, FY2008, and FY2007 requests did not specify the amount that individual Corps projects would receive for Operation and Maintenance (O&M). Instead, the Administration's would have divided the country into regions and specify O&M funding for each region for six different categories of activities — commercial navigation, flood and coastal storm damage reduction, environment, hydropower, recreation, and water supply. The FY2009 request divides the nation into 54 river systems. Congress did not adopt the regional approach in its FY2008 funding for the Corps' O&M; instead, the conference report specified amounts for individual projects and directed the Corps to prepare integrated O&M budgets for four regions — the Ohio River, the Great Lakes, the Texas coast, and the California coast.

Unlike for the FY2007 and FY2008 requests, the Corps has provided no estimates of how much individual projects within each of the 54 systems are expected to receive in FY2009. This budgeting approach appears to allow the agency flexibility to move money across projects within the region as O&M needs arise, without being subject to many of the reprogramming restrictions put into place with the agency's FY2006 appropriations. Some project stakeholders are likely to be uncomfortable as a result of the decreased certainty in the O&M funding available for particular projects under this system-based O&M budgeting approach. Attempts by Congress to specify O&M amounts for individual projects may be considered congressionally directed since no amounts appear in the President's request.

Everglades. The Corps plays a significant coordination role in the restoration of the Central and Southern Florida ecosystem. The President requested $185 million for FY2009. The agency received $131 million for FY2008 Everglades restoration activities in the omnibus report language; the FY2008 budget request had been $162 million.

The activities to be funded under the South Florida Everglades Restoration line item in the Administration's FY2009 request include Central and Southern Florida Project ($100 million), Kissimmee River Restoration Project ($31 million), Everglades and South Florida Restoration Projects ($4 million), and Modified Water (Mod Waters) Deliveries Project ($50 million). FY2006 was the first year that funds for the Mod Waters project were included in the Corps budget request and enacted appropriations; previously, the project was funded solely through Department of the Interior appropriations. The FY2008 omnibus report language noted appropriators' concerns regarding the changing design of the Mod Waters project. The report directed the Corps to submit to the Appropriations Committees its plan for completion of Mod Waters, and it provided direction to Interior regarding its funding of the project. (For more information, see CRS Report RS21331, *Everglades Restoration: Modified Water Deliveries Project*, by Pervaze A. Sheikh.)

In addition to funding for Corps activities through Energy and Water Development appropriations, federal activities in the Everglades are funded through

Department of the Interior appropriations bills. Concerns regarding the level of appropriations and progress in the restoration effort are discussed in CRS Report RS20702, *South Florida Ecosystem Restoration and the Comprehensive Everglades Restoration Plan*, by Pervaze A. Sheikh and Nicole T. Carter.

Title II: Department of the Interior

The Department of the Interior requested that Congress reduce funding for the Central Utah Project (CUP) Completion Account and also for the Bureau of Reclamation (BOR) for FY2009. The total request for Title II funding is $961.3 million — $189.6 million below FY2008 funding levels.

Table 5. Energy and Water Development Appropriations Title II: Central Utah Project Completion Account

($ millions)

Program	FY2008	FY2009 Request	House	Senate	Conf.
Central Utah Project Construction	$40.4	$39.4			
Mitigation and Conservation Activities	1.0	1.0			
Oversight & Administration	1.6	1.6			
Total, Central Utah Project	**43.0**	**42.0**			

Source: FY2009 Budget Request.

Table 6. Energy and Water Development Appropriations Title II: Bureau of Reclamation

($ millions)

Program	FY2008	FY2009 Request	House	Senate	Conf.
Water and Related Resources	$949.9	$779.3			
Policy & Administration	58.8	59.4			
CVP Restoration Fund (CVPRF)[a]	59.1	48.6			
Calif. Bay-Delta (CALFED)	40.1	32.0			
Gross Current Authority	**1,107.9**	**919.3**			
Total, Title II	**1,150.9**	**961.3**			

Source: FY2009 Budget Request.

a. This figure reflects a legislative proposal (H.R. 4024) for BOR to redirect $7.5 million collected from Friant Division water users to the new San Joaquin River Restoration Fund.

Central Utah Project and Bureau of Reclamation: Budget In Brief

The Administration requested $42.0 million for the CUP Completion Account for FY2009 (**Table 5**). The FY2009 request for BOR totals $919.3 million in gross current budget authority (**Table 6**). This amount is $188.6 million less than what was enacted for FY2008. The FY2009 request included "offsets" of $48.3 million for the Central Valley Project (CVP) Restoration Fund, yielding a "net" current authority of $871.0 million for BOR. The total budget request for Title II funding, Central Utah Project and Bureau of Reclamation, is $961.3 million.

BOR's single largest account, Water and Related Resources, encompasses the agency's traditional programs and projects, including construction, operations and maintenance, the Dam Safety Program, Water and Energy Management Development, and Fish and Wildlife Management and Development, among others. The Administration requested $779.3 million for the Water and Related Resources Account for FY2009 (**Table 6**). This amount is $170.6 million (approximately18%) less than enacted for FY2008.

Key Policy Issues — Bureau of Reclamation

Background. Most of the large dams and water diversion structures in the West were built by, or with the assistance of, the Bureau of Reclamation. Whereas the Army Corps of Engineers built hundreds of flood control and navigation projects, BOR's mission was to develop water supplies, primarily for irrigation to reclaim arid lands in the West. Today, BOR manages hundreds of dams and diversion projects, including more than 300 storage reservoirs in 17 western states. These projects provide water to approximately 10 million acres of farmland and 31 million people. BOR is the largest wholesale supplier of water in the 17 western states and the second-largest hydroelectric power producer in the nation. BOR facilities also provide substantial flood control, recreation, and fish and wildlife benefits. At the same time, operations of BOR facilities are often controversial, particularly for their effect on sensitive fish and wildlife species and conflicts among competing water users.

CALFED. The Administration requested $32.0 million for the California Bay-Delta Restoration Account (Bay-Delta, or CALFED) for FY2009 (**Table 6**). This request is nearly identical to BOR's FY2008 request of $31.8 million, and is approximately $8 million less than the $40.1 million FY2008 enactment. The bulk of the requested funds are targeted at four program areas: the environmental water account, the storage program, water quality, and conveyance. The remainder of the request is allocated for science, planning and management, and ecosystem restoration. (For more information on CALFED, see CRS Report RL31975, *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by Betsy A. Cody and Pervaze Sheikh.)

San Joaquin River Restoration Fund. BOR is proposing an allocation of $17.3 million to the San Joaquin River Restoration Fund in FY2009. The Fund would be authorized by the enactment of H.R. 4074, the San Joaquin River

Restoration Settlement Act. The Fund would implement provisions of the Stipulation of Settlement for the *Natural Resources Defense Council et al. v. Rodgers* lawsuit and would be funded through the combination of a reallocation of $7.5 million in receipts from the Friant Division water users (see **Table 6**, note *a*) and other federal and non-federal sources. In its FY2008 budget request, BOR also planned for the redirection of $7.5 million in receipts from the Friant Division water users; however, authorizing legislation was not enacted and the $7.5 million planned for the Fund was reallocated to other CVP Restoration Fund programs. (For more information on the San Joaquin River Restoration Fund, see CRS Report RL34237, *San Joaquin River Restoration Settlement*, by Betsy A. Cody, Eugene H. Buck, Harold F. Upton, Kristina Alexander, Mary Tiemann, Nicole T. Carter, Pervaze A. Sheikh, Peter Folger, and Renee Johnson.)

Security. Under BOR's Water and Related Resources account, the Administration requested $29.0 million for site security for FY2009, a decrease of $6.5 million compared with that requested for FY2007. The bulk of the request is for facility operations/security. Funding covers activities such as administration of the security program (e.g., surveillance and law enforcement), antiterrorism activities, and physical emergency security upgrades. (For more information, see CRS Report RL32189, *Terrorism and Security Issues Facing the Water Infrastructure Sector*, by Claudia Copeland.)

The FY2009 request assumes that annual costs for guard and patrol activities will be treated as project O&M costs, and hence reimbursable based on project cost allocations. These costs were estimated to be $20.1 million in FY2009, of which $12.2 million would be in up-front funding from power customers, and $7.9 million would be appropriated funds which are reimbursed by irrigation, municipal, and industrial users and other customers.

Water for America. BOR proposes funding a new program for FY2009. The Water for America Initiative, part of BOR's Water and Related Resources budget account, is a partnership between BOR and the U.S. Geological Survey (USGS). BOR indicates that the Water for America Initiative is meant to address increased demand, aging infrastructure, and decreased or changed water availability — factors that BOR has identified as threats to its ability to continue to provide water to the West. The initiative would subsume two existing BOR programs, Water 2025, and the Water Conservation Field Services program.

BOR's funding request for its portion of the program is $31.9 million ($19 million appears under a Water for America line item, and the remaining $12.9 million is included in specific programs for endangered species and other programs). These funds would be used to address two of the program's three strategies: "Plan for Our Nation's Water Future," and "Expand, Protect, and Conserve Our Nation's Water Resources." The third strategic thrust of the initiative, to be addressed by USGS, is "Enhance Our Nation's Water Knowledge."

BOR proposes to apply $8.0 million in FY2009 toward activities that fall under the "Plan for Our Nation's Water Future" thrust. This funding would be divided equally between basin studies (2 or 3 comprehensive water supply and demand studies) and investigations (with a focus on analyzing and developing new water

supplies). The balance of BOR's funding request for this initiative, $23.9 million, would be devoted to the "Expand, Protect, and Conserve Our Nation's Water Resources" effort. Within this subset of funding is $11.0 million for challenge grants, $4.0 million for the Water Conservation Field Services program, and $8.9 million for endangered species recovery activities.

Title III: Department of Energy

The Energy and Water Development bill since FY2005 has funded all DOE's programs. Major DOE activities historically funded by the Energy and Water bill include research and development on renewable energy and nuclear power, general science, environmental cleanup, and nuclear weapons programs, and now includes programs for fossil fuels, energy efficiency, the Strategic Petroleum Reserve, and energy statistics, which formerly had been included in the Interior and Related Agencies appropriations bill.

Table 7. Energy and Water Development Appropriations
Title III: Department of Energy
($ millions)

Program	FY2008	FY2009 Request	House	Senate	Conf.
Energy Supply & Conservation					
Energy Efficiency & Renewables	$1,722.4	$1,255.4			
Electricity Delivery & Energy Reliability	138.6	134.0			
Nuclear Energy	961.7	853.6			
Legacy Management	33.9	—			
Total, Energy Supply & Conservation	2,856.5	2,243.0			
Fossil Energy R&D	742.8	754.0			
Clean Coal Technology (Deferral)	(58.0)	—			
Naval Petrol. & Oil Shale Reserves	20.3	19.1			
Strategic Petroleum Reserve	186.8	344.0			
Northeast Home Heating Oil Rsrv.	12.3	9.8			
Energy Information Administration	95.5	110.6			

Program	FY2008	FY2009 Request	House	Senate	Conf.
Non-Defense Environmental Cleanup	182.3	213.4			
Uranium Decontamination and Decommissioning Fund	622.2	480.3			
Science					
High Energy Physics	689.3	805.0			
Nuclear Physics	432.7	510.1			
Basic Energy Sciences	1,269.9	1,568.2			
Bio. & Env. R&D	544.4	568.5			
Fusion	286.5	493.1			
Advanced Scientific Computing	351.2	368.8			
Cong. Directed Proj.	123.6	—			
Other	452.3	408.4			
Adjustments	(53.2)	—			
Total, Science	3,973.1	4,722.0			
Nuclear Waste Disposal	187.3	247.4			
Departmental Admin. (net)	148.4	154.8			
Office of Inspector General	46.1	51.9			
Innovative Technology Loan Guarantee	4.5	—			
National Nuclear Security Administration (NNSA)					
Weapons	6,297.5	6,618.1			
Nuclear Nonproliferation	1,336.0	1,247.0			
Naval Reactors	774.7	828.1			
Office of Administrator	402.2	404.1			
Total, NNSA	8,810.3	9,097.3			

Program	FY2008	FY2009 Request	House	Senate	Conf.
Defense Environmental Cleanup	5,349.3	5,297.3			
Other Defense Activities	754.4	1,313.5			
Defense Nuclear Waste Disposal	199.2	247.4			
Total, Defense Activities	15,113.1	15,955.4			
Power Marketing Administrations (PMA)					
Southeastern	6.4	7.4			
Southwestern	30.2	28.4			
Western	228.9	193.3			
Falcon & Armistad O&M	2.5	3.0			
Colorado River Basins		(23.0)			
Total, PMAs	267.9	209.1			
Total, Title III	**24,378.0**	**25,514.9**			

Source: FY2009 Budget Request.

The Administration's FY2009 request for DOE programs was $25.5149 billion, compared with $24.3780 billion appropriated for FY2008.

Key Policy Issues — Department of Energy

DOE administers a wide variety of programs with different functions and missions. In the following pages, the most programs are described and major issues are identified, in approximately the order in which they appear in **Table 7**.

Energy Efficiency and Renewable Energy (EERE). The President's 2008 State of the Union address set out goals to strengthen energy security and confront global climate change, and stated that "... the best way to meet these goals is for America to continue leading the way toward the development of cleaner and more energy-efficient technology."[1] As part of that effort, the Administration proposes to continue its support for the Advanced Energy Initiative (AEI, an element of the American Competitiveness Initiative), which aims to reduce America's

[1] The White House. State of the Union 2008. [http://www.whitehouse.gov/news/releases/2008/01/print/20080128-13.html]

dependence on imported energy sources. The AEI includes hydrogen, biofuels, and solar energy initiatives that are supported by programs in EERE.[2]

According to the FY2009 budget document, the Hydrogen Initiative has a long-term aim of developing hydrogen technology, and to "enable industry to commercialize a hydrogen infrastructure and fuel cell vehicles by 2020." The Biofuels Initiative seeks to make cellulosic ethanol cost competitive by 2012 using a wide array of regionally available biomass sources. The Solar America Initiative aims to "... accelerate the market competitiveness of photovoltaic systems using several industry-led consortia which are focused on lowering the cost of solar energy through manufacturing and efficiency improvements."[3] Further, the proposed FY2009 federal budget sets a goal of making solar power "cost-competitive with conventional [sources of] electricity by 2015."[4]

As **Table 8** shows, DOE's FY2009 request contains $1,255.4 million for the EERE programs. Compared to the FY2008 appropriation, the FY2009 request would reduce EERE funding by $467.0 million, or 27.1%. Three proposed cuts would comprise most of this reduction. First, the request would eliminate $186.7 million in congressionally directed assistance. Second, it would reduce Facilities construction spending by $57.3 million.[5] Third, the request would cut $227.2 million in funding to terminate the Weatherization Assistance Program. At February 2008 hearings on the FY2009 DOE budget request, concerns were raised about DOE's proposed termination of that program.[6]

Weatherization Program funding has often been a source of tension between Congress and the Administration. In 2001, the Administration launched an initiative to increase DOE Weatherization Program funding by $1.2 billion over 10 years.[7] The DOE request took a big jump for FY2002, and subsequent requests increased steadily — though modestly — through FY2005. For each of those fiscal years, the final appropriation was somewhat lower than the request. In FY2006, both trends reversed. The FY2006 request was well below the FY2005 request, and requests

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[2] U.S. Executive Office of the President, *Budget of the United States Government, Fiscal Year 2007*, Appendix, p. 390. Also see DOE, *FY2007 Congressional Budget Request: Budget Highlights*, p. 41.

[3] U.S. Executive Office of the President, *Budget of the United States Government, Fiscal Year 2009*, Appendix, p. 393.

[4] Ibid., p. 59.

[5] Facilities funding for construction tends to be provided in a lump sum. No major construction projects would be cancelled as a result of this proposed reduction.

[6] The Senate Committee on Energy and Natural Resources held a hearing on the DOE *FY2009 Budget Request* on February 6, 2008. [http://energy.senate.gov/public/index.cfm?FuseAction=Hearings.Hearing&Hearing_ID=1673]. The House Committee on Energy and Natural Resources held its hearing on February 7, 2007. [http://energycommerce.house.gov/membios/schedule.shtml]

[7] The White House. *National Energy Policy*. Report of the National Energy Policy Development Group. May 2001. p. 2-12. [http://www.whitehouse.gov/energy/National-Energy-Policy.pdf]

continued to decline annually through FY2008. Also, for FY2006 through FY2008, the final appropriations exceeded the request each year. For FY2009, the DOE request seeks to terminate the program, citing a higher benefit-cost ratio for technology programs than for the Weatherization Program.[8] A major study of the program's benefits and costs in 1989 was published in 1993. In 2007, DOE launched a plan for a comprehensive review of program benefits and costs based on data collected during program year (PY) 2006.[9]

For renewable energy technologies, **Table 8** shows that, compared to the FY2008 appropriation, the key increases are for Biomass Energy ($26.8 million) and Geothermal Energy ($10.2 million). The key decreases are for Water/Hydrokinetic Power (-$6.9 million) and Solar Energy (-$12.3 million). Overall, funding for renewable energy technologies would increase by $20.7 million (4.6%). For deployment programs, the main increase is for the Asia Pacific Partnership ($7.5 million).[10] Also, the request would terminate the Renewable Energy Production Incentive (-$5.0 million).[11]

For energy efficiency technologies, **Table 8** shows that, compared with the FY2008 appropriation, the main increase is for Buildings ($14.8 million) and the only decrease is for Industrial programs (-$2.3 million). Overall, energy efficiency technologies would increase by $22.7 million (5.6%). For deployment programs, the main increase is for State programs ($5.9 million). Also, as noted above, the request seeks to terminate the Weatherization Program (-$227.2 million).

Electricity Delivery and Energy Reliability. The FY2009 request includes $134.0 million for the Office of Electricity Delivery and Energy Reliability (OE). Compared with the FY2008 appropriation, the FY2009 request would reduce funding by $4.6 million, or 3.3%.

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[8] DOE states that "EERE's Energy Efficiency portfolio has historically provided approximately a 20 to 1 benefit to cost ratio. In comparison, Weatherization has a benefit cost ratio of 1.53 to 1." DOE, *FY 2009 Congressional Budget Request*, vol. 3, p. 44.

[9] The 1993 study and the 2007 plan are discussed in DOE. Oak Ridge National Laboratory. *National Evaluation of the Weatherization Assistance Program: Preliminary Evaluation Plan for Program Year 2006.* February 2007. p. 1.

[10] *DOE Request*, p. 482-483. The Asia Pacific Partnership (APP) is a multinational undertaking that the federal government supports through several agencies. The Department of State is the lead agency for APP. DOE's request for APP in FY2009 would support new renewable power generating capacity, best manufacturing practices for targeted industries, and best design and construction practices for buildings and efficient appliance standards.

[11] For a brief discussion of the Renewable Energy Production Incentive, see the section on Clean Renewable Energy Bonds in CRS Report RL34162, *Renewable Energy: Background and Issues for the 110th Congress.*

Table 8. Energy Efficiency and Renewable Energy Programs

($ millions)

Program	FY2006	FY2007	FY2008	FY2009 Request	FY2009 - FY2008	FY2009 - FY2008 Percent
Hydrogen Technologies	$153.5	$189.5	$211.1	$146.2	-64.8	-30.7%
Biomass & Biorefinery Systems	89.8	196.3	198.2	225.0	26.8	13.5%
Solar Energy	81.8	157.0	168.5	156.1	-12.3	-7.3%
— Photovoltaics	58.8	138.4	136.7	137.1	0.4	-0.3%
Wind Energy	38.3	48.7	49.5	52.5	3.0	6.0%
Geothermal Technology	22.8	5.0	19.8	30.0	10.2	51.4%
Water Power (Hydro/Ocean)	0.5	0.0	9.9	3.0	-6.9	-69.7%
Subtotal, Renew. & Hydrogen	386.6	596.5	657.0	612.8	-44.1	-6.7%
Vehicle Technologies	178.4	183.6	213.0	221.1	8.0	3.8%
Building Technologies	68.2	103.0	109.0	123.8	14.8	13.5%
Industrial Technologies	55.9	55.8	64.4	62.1	-2.3	-3.6%
Federal Energy Management	19.0	19.5	19.8	22.0	2.2	11.0%
Subtotal, Efficiency R&D	321.4	361.8	406.3	429.0	22.7	5.6%
Facilities & Infrastructure	26.1	107.0	76.2	14.0	-62.2	-81.6%
Program Management	115.2	110.2	114.9	141.8	27.0	23.5%
R&D Subtotal	849.2	1,175.5	1,254.3	1,197.6	-56.6	-4.5%
Federal Assistance						
— Weatherization Grants	242.6	204.6	227.2	0.0	-227.2	-100.0%
— State Energy Grants	36.1	58.8	44.1	50.0	5.9	13.4%
— Renewables Deployment	38.2	18.4	10.9	8.5	-2.4	-22.0%
— Cong.-Directed Assistance[b]	—	0.0	186.7	0.0	-186.7	-100.0%
— Prior Year Balances	—	—	(0.7)	-0.7	0.0	-0.7%
Federal Assistance Subtotal	316.9	281.7	468.1	57.8	-410.4	-87.7%
Total Appropriation, EE & RE	1,166.1	1,457.2	1,722.4	1,255.4	-467.0	-27.1%
Office of Electricity Delivery & Energy Reliability (OE)[a]	158.2	134.4	138.6	134.0	-4.6	-3.3%

Sources: DOE FY2007 Operating Plan; H.Rept. 110-185; S.Rept. 110-127; Joint Explanatory Statement on the Consolidated Appropriations Act of 2007 (Cong. Record, Dec. 17, 2007, p. 15587 and p. H15940).

a. The Distributed Energy Program was moved from EERE to OE in FY2006.

b. In FY2006, there was $159.0 million in congressionally-directed funds spread over EERE accounts. For FY2008, the House approved (H.Rept. 110-185, part 2) $104.3 million for congressionally directed assistance to be taken from available funds. The Senate Appropriations Committee recommended $90.3 million in assistance, to be provided from a separate (new) account line.

Nuclear Energy. For nuclear energy research and development — including advanced reactors, fuel cycle technology and facilities, nuclear hydrogen production, and infrastructure support — DOE requested $1.419 billion for FY2009. That amount is about 40% higher than the FY2008 appropriation of $1.033 billion. The FY2009 request includes an 80% increase in assistance for new commercial reactor orders (Nuclear Power 2010), a 70% increase for nuclear spent fuel reprocessing R&D (the Advanced Fuel Cycle Initiative), and a 75% boost for a mixed-oxide (MOX) fuel fabrication facility to make fuel from surplus weapons plutonium. Those activities are funded by various appropriations accounts through DOE's Office of Nuclear Energy.

According to DOE's FY2009 budget justification, the nuclear energy R&D program is intended "to develop new nuclear energy generation technologies to meet energy and climate goals." However, opponents have criticized DOE's nuclear research program as providing wasteful subsidies to an industry that they believe should be phased out as unacceptably hazardous and economically uncompetitive.

The increased funding for the Advanced Fuel Cycle Initiative (AFCI) would help implement the Administration's Global Nuclear Energy Partnership (GNEP). GNEP is intended to develop technologies for recycling uranium and plutonium from spent nuclear fuel without creating pure plutonium that could be easily used for nuclear weapons. According to DOE's budget justification, such technologies could allow greater expansion of nuclear power throughout the world "with reduced risk of nuclear weapons proliferation."[12] But nuclear opponents dispute DOE's contention that nuclear recycling technology can be made sufficiently proliferation-resistant for widespread use.

Nuclear Power 2010. President Bush's specific mention of "emissions-free nuclear power" in his 2008 State of the Union address reiterated the Administration's interest in encouraging construction of new commercial reactors — for which there have been no U.S. orders since 1978. DOE's efforts to restart the nuclear construction pipeline have been focused on the Nuclear Power 2010 Program, which will pay up to half of the nuclear industry's costs of seeking regulatory approval for new reactor sites, applying for new reactor licenses, and preparing detailed plant designs. The Nuclear Power 2010 Program, which includes the Standby Support Program authorized by the Energy Policy Act of 2005 (P.L. 109-58) to pay for regulatory delays, is intended to encourage near-term orders for advanced versions of existing commercial nuclear plants.

Two industry consortia are receiving DOE assistance over the next several years to design and license new nuclear power plants. DOE awarded the first funding to the consortia in 2004. DOE requested $241.6 million for Nuclear Power 2010 for FY2009, an increase of $107.8 million from the FY2008 funding level. According to DOE's budget justification, the additional funding will be used to accelerate the first-of-a-kind design activities for the two reactors being planned by the two industry

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[12] Department of Energy, *FY 2009 Congressional Budget Request*, February 2008, Vol. 3, p. 691.

consortia, the Westinghouse AP1000 reactor and the General Electric Economic Simplified Boiling Water Reactor (ESBWR).

The nuclear license applications under the Nuclear Power 2010 program are intended to test the "one-step" licensing process established by the Energy Policy Act of 1992 (P.L. 102-486). Under the process, NRC may grant a combined construction permit and operating license (COL) that allows a completed plant to begin operation if all construction criteria have been met. Even if the licenses are granted by NRC, the industry consortia funded by DOE have not committed to building new reactors. Two consortia are receiving Nuclear Power 2010 assistance:

- A consortium led by Dominion Resources that is preparing a COL for the GE ESBWR. The proposed reactor would be located at Dominion's existing North Anna plant in Virginia, where the company received an NRC early-site permit with DOE assistance. Dominion Energy submitted a COL application for a new unit at North Anna on November 27, 2007.

- A consortium called NuStart Energy Development, which includes Exelon and several other major nuclear utilities. NuStart announced on September 22, 2005, that it would seek a COL for two Westinghouse AP1000 reactors at the site of TVA's uncompleted Bellefonte nuclear plant in Alabama and for an ESBWR at the Grand Gulf plant in Mississippi. The Nuclear Power 2010 Program is providing funding for review and approval of the Bellefonte COL, which was submitted to NRC on October 30, 2007.

The Nuclear Power 2010 Program also helped three utilities seek NRC Early Site Permits (ESPs) for potential new reactors in Illinois, Mississippi, and Virginia. NRC issued the first of these on March 15, 2007, to Exelon Generating Company for a potential new reactor at the company's Clinton, Illinois, nuclear plant. The Clinton ESP cost $15 million, of which DOE paid half. NRC authorized a second ESP on March 27, 2007, for the Grand Gulf site in Mississippi, and a third, for the North Anna site in Virginia, on November 20, 2007. The holders of those ESPs will not have to revisit site-related issues if they seek licenses for new reactors at those locations during the next 20 years.

Generation IV. Advanced commercial reactor technologies that are not yet close to deployment are the focus of DOE's Generation IV Nuclear Energy Systems Initiative, for which $70.0 million was requested for FY2009. The request is $44.9 million below the FY2008 funding level of $114.9 million, which was nearly triple the Administration's FY2008 budget request of $36.1 million.

Most of the FY2009 request — $59.5 million — is for Next Generation Nuclear Plant (NGNP) research and development, which received an FY2008 appropriation of $114.1 million. Under DOE's current plans, NGNP will use Very High Temperature Reactor (VHTR) technology, which features helium as a coolant and coated-particle fuel that can withstand temperatures up to 1,600 degrees celsius.

The Energy Policy Act of 2005 authorizes $1.25 billion through FY2015 for NGNP development and construction (Title VI, Subtitle C). The authorization requires that NGNP be based on research conducted by the Generation IV program and be capable of producing electricity, hydrogen, or both. Phase I research on the NGNP is to continue until 2011, when a decision will be made on moving to the Phase II design and construction stage, according to the FY2009 DOE budget justification.

Advanced Fuel Cycle Initiative. The Advanced Fuel Cycle Initiative funding request for FY2009 is $301.5 million, nearly 70% above the FY2008 appropriation of $179.4 million. The final FY2008 appropriation was far below the FY2008 request of $395.0 million. AFCI, the primary component of the GNEP program, includes R&D on reprocessing technology and fast reactors that could use reprocessed plutonium.

According to the DOE budget justification, AFCI will develop and demonstrate nuclear fuel cycles that could reduce the long-term hazard of spent nuclear fuel and recover additional energy. Such technologies would involve separation of plutonium, uranium, and other long-lived radioactive materials from spent fuel for reuse in a nuclear reactor or for transmutation in a particle accelerator. Much of the program's research will focus on a separations technology called UREX+, in which uranium and other elements are chemically removed from dissolved spent fuel, leaving a mixture of plutonium and other highly radioactive elements.

FY2009 funding of $10.4 million was requested for conceptual design work on an Advanced Fuel Cycle Facility (AFCF) to provide an engineering-scale demonstration of AFCI technologies, according to the budget justification. The FY2008 Consolidated Appropriations act rejected funding for development of AFCF.

Removing uranium from spent fuel would eliminate most of the volume of spent nuclear fuel that would otherwise require disposal in a deep geologic repository, which DOE is developing at Yucca Mountain, Nevada. The UREX+ process also could reduce the heat generated by nuclear waste — the major limit on the repository's capacity — by removing cesium and strontium for separate storage and decay over several hundred years. Plutonium and other long-lived elements would be fissioned in accelerators or fast reactors to reduce the long-term hazard of nuclear waste. Even if technically feasible, however, the economic viability of such waste processing has yet to be determined, and it still faces significant opposition on nuclear nonproliferation grounds. Nevertheless, proponents believe the process is proliferation-resistant, because further purification would be required to make the plutonium useable for weapons and because its high radioactivity would make it difficult to divert or work with.

Under the Administration's GNEP initiative, plutonium partially separated from the highly radioactive spent fuel from nuclear reactors would be recycled into new fuel to expand the future supply of nuclear fuel and potentially reduce the amount of radioactive waste to be disposed of in a permanent repository. Under the initial concept for GNEP, the United States and other advanced nuclear nations would lease new fuel to other nations that agreed to forgo uranium enrichment, spent fuel recycling (also called reprocessing), and other fuel cycle facilities that could be used

to produce nuclear weapons materials. The leased fuel would then be returned to supplier nations for reprocessing. Solidified high-level reprocessing waste would be sent back to the nation that had used the leased fuel, along with supplies of fresh nuclear fuel. The Nuclear Nonproliferation Treaty guarantees the right of all participants to develop fuel cycle facilities, and a GNEP Statement of Principles signed by the United States and 15 other countries on September 16, 2007, preserves that right, while encouraging the establishment of a "viable alternative to acquisition of sensitive fuel cycle technologies."[13]

Although GNEP is largely conceptual at this point, DOE issued a Spent Nuclear Fuel Recycling Program Plan in May 2006 that provided a general schedule for a GNEP Technology Demonstration Program (TDP),[14] which would develop the necessary technologies to achieve GNEP's goals. According to the Program Plan, the first phase of the TDP, running through FY2006, consisted of "program definition and development" and acceleration of AFCI. Phase 2, running through FY2008, was to focus on the design of technology demonstration facilities, which then were to begin operating during Phase 3, from FY2008 to FY2020. The National Academy of Sciences in October 2007 strongly criticized DOE's "aggressive" deployment schedule for GNEP and recommended that the program instead focus on research and development.[15]

As part of GNEP, AFCI is conducting R&D on an Advanced Burner Reactor (ABR) that could destroy recycled plutonium and other long-lived radioactive elements. DOE requested $18.0 million for the ABR program for FY2009, up from $11.7 million in FY2008. The program is expected to focus on developing a sodium-cooled fast reactor (SFR).

Existing U.S. commercial nuclear reactors use water to slow down, or "moderate," the neutrons released by the fission process (splitting of nuclei). The relatively slow (thermal) neutrons are highly efficient in causing fission in certain isotopes of heavy elements, such as uranium 235 and plutonium 239. Therefore, fewer of those isotopes are needed in nuclear fuel to sustain a nuclear chain reaction (in which neutrons released by fissioned nuclei then induce fission in other nuclei, and so forth). The downside is that thermal neutrons cannot efficiently induce fission in more than a few specific isotopes.

In contrast, "fast" neutrons, which have not been moderated, are less effective in inducing fission than thermal neutrons but can induce fission in a much wider range of isotopes, including all major plutonium isotopes. Therefore, nuclear fuel for a fast reactor must have a higher proportion of fissionable isotopes than a thermal reactor to sustain a chain reaction, but a larger number of different isotopes can constitute that fissionable proportion.

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[13] See GNEP website at [http://www.gnep.energy.gov]

[14] DOE, *Spent Nuclear Fuel Recycling Plan*, Report to Congress, May 2006.

[15] National Academy of Sciences, *Review of DOE's Nuclear Energy Research and Development Program*, prepublication draft, October 2007.

A fast reactor's ability to fission most heavy radioactive isotopes, called "transuranics" (TRU), makes it theoretically possible to repeatedly separate those materials from spent fuel and feed them back into the reactor until they are entirely fissioned. In a thermal reactor, the buildup of non-fissile isotopes sharply limits the number of such separation cycles before the recycled fuel can no longer sustain a nuclear chain reaction.

"Given the benefits of continuous recycling, at this time GNEP-TDP is focused on the development of fast reactor technologies, recognizing that fast reactor operating experience is much more limited than thermal reactor operating experience, and that fast burn reactor fuels, or transmutation fuels, are not fully developed," according to the DOE Program Plan.[16]

Nuclear critics oppose GNEP's emphasis on spent fuel reprocessing, which they see as a weapons proliferation risk, even if weapons-useable plutonium is not completely separated from other spent fuel elements, as envisioned by the Administration. "As the research of DOE scientists makes clear, the reprocessing technologies under consideration would still produce a material that is not radioactive enough to deter theft, and that could be used to make nuclear weapons," according to the Union of Concerned Scientists.[17]

Nuclear Hydrogen Initiative. In support of President Bush's program to develop hydrogen-fueled vehicles, DOE requested $16.6 million for FY2009 for the Nuclear Hydrogen Initiative, about 67% above the FY2008 funding level but below the FY2007 appropriation. According to DOE's FY2009 budget justification, the program will continue laboratory-scale experiments to allow selection by 2011 of a hydrogen-production technology for pilot-scale demonstration by 2013.

Mixed Oxide Fuel Fabrication Facility. DOE requested $487.0 million for the Mixed Oxide Fuel Fabrication Facility at the Savannah River Site in South Carolina — a 75% increase from the FY2008 funding level. The multi-billion-dollar facility is intended to convert surplus weapons plutonium into oxide form and then blend it with uranium oxide to produce fuel for nuclear power plants. The FY2008 Consolidated Appropriations act shifted funding for the project to the DOE nuclear energy program from the Defense Nuclear Nonproliferation account. For FY2009, DOE proposes to shift the program's funding to the Other Defense Activities account. (See "Nuclear Weapons Stockpile Stewardship: Directed Stockpile Work," below.)

Fossil Energy Research, Development, and Demonstration. The Bush Administration's FY2009 budget request of $765.3 million for Fossil Energy Research and Development represents a 35% increase over the FY2008 request of $566.8 million (see **Tables 9** and **10**). The FY2008 Consolidated Appropriations Act

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[16] *Spent Nuclear Fuel Recycling Program Plan,* op. cit., p. 8.

[17] Union of Concerned Scientists, *U.S. Nuclear Fuel Reprocessing Initiative*, [http://www.ucsusa.org/global_security/nuclear_terrorism/US_Nuclear_Fuel_Reprocessing_Initiative.html], viewed March 14, 2008.

provided $750 million for Fossil Energy Research and Development programs.[18] Major funding categories under the current request include $623.7 for Clean Coal Technology, $126.3 for Program Direction, $5 million for Plant and Capital Equipment, $9.7 million for Fossil Energy Environmental Restoration (remediates the National Energy Technology Laboratory at the Morgantown, WV; Pittsburgh, PA; Tulsa, OK; Fairbanks, AK; and Albany, OR, sites), and $0.7 million for Special Recruitment Programs. The increased request reflects the deferral of $149 million in prior year obligation to FY2009. FutureGen remains the centerpiece for demonstrating carbon capture and sequestration (CC&S), but under a change in direction. Instead of a single 275-megawatt Integrated Gasification Combined Cycle (IGCC) plant as first envisioned, the redirected FutureGen would focus on demonstrating CC&S at two or three commercial IGCC plants.

Under the FY2009 request, programs in Natural Gas Technology, Petroleum-Oil Technology, and Cooperative R&D would be left unfunded. DOE had proposed terminating programs in Natural Gas Technology and Petroleum-Oil Technology in FY2008. OMB rated both programs as ineffective based on its Program Assessment Rating Tool. Nor had DOE requested funding for Plant and Capital Equipment or the Cooperative Research and Development program (believing that research center sponsored work can compete for Fossil Energy funding through the competitive solicitation process, DOE had not requested funding in FY2007 or FY2008). Congress reinstated the funding of these programs in FY2008.

Table 9. Clean Coal Technology Transfers and Deferrals

($ Millions)

Clean Coal Technology	FY2008 Request	FY2008 Appropriations	FY2009 Request
Deferred. unobligated balance, FY2008	257.0	257.0	0
Deferred. unobligated balance, FY2009		-149.0	149.0
Rescission, uncommitted balance	-149.0		
Transfer to Clean Coal Pwr. Init.	-58.0	-70.0	0
Transfer to FutureGen	-108.0	-75.0	-149.0
Transfer to Fuels and Power Sys.		-21.0	0
Total	**-58.0**	**-58.0**	

Source: FY2009 Budget Request

[18] Division C — Energy and Water Development and Related Agencies Appropriations Act, 2008 ($708.8 million was proposed by the House and $808.1 million proposed by the Senate).

Table 10. Fossil Energy Research and Development
($ Millions)

Program	FY2008 Request	FY2008 Approp.	FY2009 Request
Clean Coal Power Initiative	73.0	70.0	85.0
FutureGen	108.0	75.0	156.0
Fuels and Power Systems			
- Innovations for existing plants		*36.4*	*40.0*
- Advanced IGCC		*54.0*	*69.0*
- Advanced turbines		*24.0*	*28.0*
- Carbon sequestration		*120.0*	*149.1*
- Fuels		*25.0*	*10.0*
- Fuel Cell		*56.0*	*60.0*
Subtotal	245.6	352.9	383.7
Natural Gas Technologies	—	20.0	—
Petroleum-Oil Technologies	—	5.0	—
Program Direction	130.0	150.0	126.3
Plant and Capital Equipment	—	13.0	5.0
Fossil Energy Environ. Restoration	9.6	9.6	9.7
Special Recruitment Program	0.7	0.7	0.7
Cong. Directed Projects	—	48.0	—
Other	0.7	—	—
Total	**566.8**	**750.0**	**765.3**

Source: FY2009 Budget Request

The Energy Policy Act of 2005 (P.L. 109-58, Title IV) authorizes the annual appropriation of $200 million in FY2006 through FY2014 for the Clean Coal Power Initiative (see **Table 11**). Of the funds made available, 70% (i.e., $140 million annually) are to be used only in funding coal-based gasification technologies: combined cycle, fuel cell, coproduction, hybrid, and advanced technologies capable of producing concentrated carbon monoxide — technologies aimed at FutureGen. The Coal and Related Technologies Program is authorized $611 million in FY2007, $626 million in FY2008, and $641 million in FY2009, in addition to programs for research, development, demonstration, and commercial application of coal-based

power generation through gasification, advanced combustion, and turbines for synthesis gas derived from coal.

Table 11. Energy Policy Act of 2005 Title IV Authorization
($ millions)

EPAct Authorization	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Clean Coal Power	200	200	200	200	200	200	200	200	200
FutureGen related	140	140	140	140	140	140	140	140	140
Fossil Energy		611	626	641					

Source: DOE FY2008 Budget Request.

Strategic Petroleum Reserve. The Strategic Petroleum Reserve (SPR), authorized by the Energy Policy and Conservation Act (P.L. 94-163) in 1975, consists of caverns formed out of naturally occurring salt domes in Louisiana and Texas in which nearly 700 million barrels of crude oil are stored. Its current capacity is 727 million barrels, and it is authorized at 1 billion barrels. The purpose of the SPR is to provide an emergency source of crude oil that may be tapped in the event of a presidential finding that an interruption in oil supply, or an interruption threatening adverse economic effects, warrants a drawdown from the reserve. A Northeast Heating Oil Reserve (NHOR) was established during the Clinton Administration. NHOR houses 2 million barrels of home heating oil in above-ground facilities in Connecticut, New Jersey, and Rhode Island.

Program costs for the SPR in recent years have been dedicated principally to maintaining SPR facilities and keeping the SPR in readiness should it be needed. Since FY1999, any fill of the SPR has been with deliveries of royalty-in-kind (RIK) oil to the SPR in lieu of cash royalties to the federal government on offshore production. Through FY2007, royalty-in-kind deliveries to the SPR have totaled roughly 140 million barrels and forgone receipts to the Department of the Interior are estimated to be $4.6 billion. DOE has projected deliveries of RIK oil during FY2008 of 19.1 million barrels and $1.170 billion in forgone revenues.[19]

The Administration request for FY2009 for the SPR is $346.9 million. As in its FY2008 request, the Administration is seeking funding to expand the capacity of the SPR to 1 billion barrels by adding 115 million barrels of capacity at three existing sites and establishing a new site, in Richton, Mississippi, where 160 million barrels of capacity would be created. Included in the request is $13.5 million to initiate the National Environmental Policy Act (NEPA) environmental review process for expansion of the SPR to 1.5 billion barrels, a level not yet authorized by Congress

[19] Annual figures through FY2006 may be found in the Strategic Petroleum Reserve Annual Report for FY2006, p. 39, [http://www.fossil.energy.gov/programs/reserves/publications/Pubs-SPR/spr_annual_rpt_06.pdf]. Estimates for FY2008 furnished in a communication from DOE.

but strongly supported by the Administration. Congress approved nearly $25 million in the FY2008 budget for land acquisition at the Richton site but otherwise expressed opposition to funding expansion. In its report on the FY2008 appropriations bill (H.Rept. 110-185), the House Committee on Appropriations noted an estimate that it would cost $10 billion to create additional capacity and $55 billion to fill it, and expansion would not be completed until 2027. The Committee said the plans for the expansion lacked "analytical clarity." Congress approved funding of $186.8 million for FY2008; the Administration had requested $331.6 million.

The Administration has requested $9.8 million for the NHOR in FY2009, a reduction of $2.5 million from the FY2008 enactment, principally due to a reduction in the need for funds for repurchasing heating oil that was sold during FY2007 to finance new storage contracts.

Meanwhile, fill of the SPR with royalty-in-kind oil continues to be controversial. Critics argue that it is inadvisable to add oil to the SPR when markets are tight and prices remain high. They argue further that the additional oil adds little to U.S. energy security. Supporters of RIK fill argue that the fill rate is too little to have a discernible impact on markets, and that currently high refined-product prices are sustained by factors other than crude supply, which is more than ample at this time. Legislation has been introduced in the Second Session (H.R. 5146, S. 2598) to suspend RIK fill. The House bill would also mandate a sale of 13 million barrels of SPR oil during FY2008, with the proceeds to be spent on a number of energy efficiency and alternative fuel programs. Both bills would establish conditions, including a significant decline in crude oil prices, that would have to be satisfied before RIK fill could be resumed. The outlook for these bills is unclear.

Science. The DOE Office of Science conducts basic research in six program areas: basic energy sciences, high-energy physics, biological and environmental research, nuclear physics, fusion energy sciences, and advanced scientific computing research. Through these programs, DOE is the third-largest federal funder of basic research and the largest federal funder of research in the physical sciences.[20] For FY2009, DOE has requested $4.722 billion for Science, an increase of 19% from the FY2008 amount of $3.973 billion. This unusually large increase reflects the American Competitiveness Initiative (ACI), which President Bush announced in January 2006. Over 10 years, the ACI would double the combined R&D funding of the DOE Office of Science and two other agencies.

The requested funding for the largest Office of Science program, basic energy sciences, is $1.568 billion, up 23% from FY2008. Increases include $153 million for a new program of Energy Frontier Research Centers,[21] $66 million to initiate

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[20] Based on preliminary FY2006 data from Tables 29 and 22 of National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2004-06*, NSF 07-323 (June 2007).

[21] These are intended to address energy challenges identified by the Basic Energy Sciences Advisory Committee in its December 2007 report *Directing Matter and Energy: Five Challenges for Science and the Imagination*, online at [http://www.sc.doe.gov/bes/reports/

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construction of the National Synchrotron Light Source II at Brookhaven National Laboratory, and $73 million to expand facility operating time. The House and Senate appropriations reports for FY2006 both called for an increase for facility operating time. Increases were proposed in the FY2007 and FY2008 budget requests and funded in the House and Senate appropriations bills for those years, but were not ultimately included in either the FY2007 or the FY2008 appropriation. (The request also includes increases to expand facility operating time in some of the other Office of Science research programs.)

For high-energy physics, the request is $805 million, a 17% increase from FY2008. Included are increases for three programs whose funding Congress sharply reduced in the final FY2008 appropriation: $37 million (up from $6 million) for construction of the NOVA detector at Fermilab, $25 million (up from $5 million) for superconducting radiofrequency R&D, and $35 million (up from $15 million) for R&D related to the proposed International Linear Collider. The request includes $10 million for the DOE/NASA Joint Dark Energy Mission (JDEM). Responding to appropriations report language in FY2008, NASA has included its portion of JDEM in its FY2009 request.

The request for biological and environmental research is $569 million, up 4%. The bulk of the requested increase is for climate change modeling.

For nuclear physics, the request is $510 million, up 18% from FY2008. Included are $20 million for isotope production and applications (transferred from the Office of Nuclear Energy) and $15 million to begin construction of an upgrade at the Continuous Electron Beam Accelerator Facility (CEBAF). Most other nuclear physics activities would also receive increases.

The request for fusion energy sciences is $493 million, up 72%. Almost the entire increase ($204 million) is for the U.S. share of the International Thermonuclear Experimental Reactor (ITER), a fusion facility now under construction in France. For FY2008, although the House and Senate bills both provided the requested amount for ITER, the final appropriation eliminated all except $10 million for related R&D. According to press reports, ITER officials expect the lack of U.S. funds in FY2008 to have no immediate impact on the project's planned 2008 start, but "what the other ITER partners now want from the United States is clarity" about its plans.[22] The ITER partners are China, the European Union, India, Japan, Russia, South Korea, and the United States. Under an agreement signed in 2006, the U.S. share of ITER's construction cost is 9.1%. That share is now expected to be between $1.45 billion and $2.2 billion, with a completion date between FY2014 and FY2017. A preliminary estimate of $1.122 billion through FY2014 was revised upwards in December 2007.

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[21] (...continued)
files/GC_rpt.pdf].

[22] Dennis Normile, "U.S. Wavers Again on ITER", *ScienceNOW Daily News*, December 21, 2007, [http://sciencenow.sciencemag.org/cgi/content/full/2007/1221/1].

The request for the smallest of the Office of Science research programs, advanced scientific computing research, is $369 million, up 5% from FY2008. The majority of the requested increase would fund establishment of a new Applied Mathematics-Computer Science Institute.

The request for laboratory infrastructure is $110 million, up 65% from FY2008. An Infrastructure Modernization Initiative, to be funded in FY2009 by transfers from the research programs, accounts for $33 million of the requested increase.

Nuclear Waste Disposal. DOE's Office of Civilian Radioactive Waste Management (OCRWM) is responsible for developing a nuclear waste repository at Yucca Mountain, Nevada, for disposal of nuclear reactor spent fuel and defense-related high-level radioactive waste.

The FY2009 OCRWM request is $494.7 million, 28% above the FY2008 appropriation. However, the FY2008 level of $386.4 million is about $50 million below the FY2007 level and more than $100 million below the Administration's FY2007 request. The funding cut will force at least 500 layoffs at the Yucca Mountain Project and probably will delay OCRWM's plans to submit the Yucca Mountain license application to the Nuclear Regulatory Commission by June 30, 2008, according to Program Director Edward Sproat. He told a Nevada legislative committee that OCRWM's goal of opening the repository by 2017 would also be pushed back.[23]

Funding for the program is provided under two appropriations accounts. The Administration requested $247.4 million from the Nuclear Waste Fund, which holds fees paid by nuclear utilities. An additional $247.4 million was requested in the Defense Nuclear Waste Disposal account, which pays for disposal of high-level waste from the nuclear weapons program in the planned Yucca Mountain repository.

The Nuclear Waste Policy Act of 1982 (NWPA, P.L. 97-425), as amended, names Yucca Mountain as the sole candidate site for a national geologic repository. Congress passed an approval resolution in July 2002 (H.J.Res. 87, P.L. 107-200) that authorized the Yucca Mountain project to proceed to the licensing phase.

NWPA required DOE to begin taking waste from nuclear plant sites by January 31, 1998. Nuclear utilities, upset over DOE's failure to meet that deadline, have won two federal court decisions upholding the department's obligation to meet the deadline and to compensate utilities for any resulting damages. Utilities have also won several cases in the U.S. Court of Federal Claims. DOE estimates that liability payments will total $7 billion if Yucca Mountain begins receiving waste by 2017 and $11 billion if the repository's opening is delayed until 2020.[24] (For more information, see CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by Mark Holt.)

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[23] Rogers, Keith, "Yucca Mountain Layoffs Imminent, Official Warns," *Las Vegas Review-Journal*, January 18, 2008 (through Energy Central Professional).

[24] Statement of Edward F. Sproat III, Director of the Office of Civilian Radioactive Waste Management, Before the House Budget Committee, October 4, 2007.

Loan Guarantees. Congress established the DOE Innovative Technology Loan Guarantee Program in the Energy Policy Act of 2005. The act authorized loan guarantees for energy projects using "new or significantly improved technologies" to reduce greenhouse gas emissions.

The FY2008 omnibus act allowed DOE to guarantee repayment of up to $38.5 billion in loans for energy projects during FY2008 and FY2009. Of that amount, $18.5 billion is for nuclear power plants, $6 billion for coal projects that incorporate carbon capture and sequestration, $2 billion for advanced coal gasification, $10 billion for renewable energy and energy efficiency projects, and $2 billion for uranium enrichment and other "front end" nuclear fuel cycle facilities. DOE must submit an implementation plan to the House and Senate Appropriations Committees at least 45 days before issuing the loan guarantees.

DOE's FY2009 budget request proposes to extend the previously approved $38.5 billion in loan guarantee authority. Under the request, $20 billion would be available through FY2010 for technologies other than nuclear power plants, while the remaining $18.5 billion for nuclear power plants would continue to be available through FY2011. In addition to the $38.5 billion in loan guarantee authority that must be used by FY2010 and FY2011, the FY2007 DOE appropriation (included in P.L. 110-5) provided $4 billion in loan guarantee authority with no expiration date or specified technology. To administer the loan guarantee program, DOE requested an appropriation of $19.9 million for FY2009, an amount that is to be entirely offset by fees imposed on project sponsors.

Nuclear Weapons Stockpile Stewardship. Congress established the Stockpile Stewardship Program in the FY1994 National Defense Authorization Act (P.L. 103-160) "to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons." The program is operated by the National Nuclear Security Administration (NNSA), a semiautonomous agency within DOE that Congress established in the FY2000 National Defense Authorization Act (P.L. 106-65, Title XXXII). It seeks to maintain the safety and reliability of the U.S. nuclear stockpile.

Stockpile stewardship consists of all activities in NNSA's Weapons Activities account: three main programs — Directed Stockpile Work, Campaigns, and Readiness in Technical Base and Facilities — as well as several smaller ones. All are described below. **Table 12** presents their funding. NNSA manages two programs outside of Weapons Activities: Defense Nuclear Nonproliferation, discussed later in this report, and Naval Reactors.

Most stewardship activities take place at the nuclear weapons complex, which consists of three laboratories (Los Alamos National Laboratory, NM; Lawrence Livermore National Laboratory, CA; and Sandia National Laboratories, NM and CA); four production sites (Kansas City Plant, MO; Pantex Plant, TX; Savannah River Site, SC; and Y-12 Plant, TN); and the Nevada Test Site. NNSA manages and sets policy for the complex; contractors to NNSA operate the eight sites.

Table 12. Funding for Weapons Activities
($ millions)

Program	FY2008 Current Approp.	FY2009 Request	House Approps. Cmte.	Senate Approps. Cmte.	Final Appropriation (P.L. 110-xxx)
DSW	1,401.3	$1,675.7			
Campaigns	1,873.7	1,631.7			
RTBF	1,637.4	1,720.5			
Other[a]	1,385.0	1,589.9			
Total	**6,297.5**	**6,618.1**			

Sources: DOE FY2009 Congressional Budget Request, vol. 1 (NNSA), p. 71.
Notes: Details may not add to totals due to rounding. DSW, Directed Stockpile Work; RTBF, Readiness in Technical Base and Facilities.
a. Includes Secure Transportation Asset, Nuclear Weapons Incident Response, Facilities and Infrastructure Recapitalization Program, Environmental Projects and Operations, Transformation Disposition, Defense Nuclear Security, Cyber Security, Congressionally Directed Projects, and several adjustments.

The FY2009 request document includes data from NNSA's Future Years Nuclear Security Program (FYNSP), which projects the budget and components through FY2013 (see **Table 13**).

Table 13. NNSA Future Years Nuclear Security Program
($ millions)

	FY2010	FY2011	FY2012	FY2013
DSW	$1,762.1	1,790.0	1,760.2	1,776.4
Campaigns	1,588.4	1,494.9	1,495.7	1,516.5
RTBF	1,904.4	2,153.6	2,275.9	2,372.9
Other[a]	1,731.0	1,759.4	1,755.1	1,794.4
Total	**6,985.7**	**7,197.8**	**7,286.9**	**7,460.3**

Source: DOE FY2009 Congressional Budget Request, vol. 1 (NNSA), pp. 72.
Note: Details may not add to totals because of rounding.
a. Includes Secure Transportation Asset, Nuclear Weapons Incident Response, Facilities and Infrastructure Recapitalization Program, Environmental Projects and Operations, Safeguards and Security, and several adjustments.

Nuclear Weapons Complex Reconfiguration. Although the nuclear weapons complex (the "Complex") currently consists of the eight sites noted above, it was much larger during the Cold War in terms of number of sites, budgets, and personnel. Despite the post-Cold War reduction, many in Congress have for years

wanted the Complex to change further, in various ways: fewer personnel, lower cost, greater efficiency, smaller footprint at each site, increased security, and the like. (For congressional action on FY2005-FY2008 appropriations, see CRS Report RL34009, *Energy and Water Development: FY2008 Appropriations*.) In response, in January 2007 NNSA submitted a report to Congress on its plan for transforming the Complex, "Complex 2030."

The House Appropriations Committee, in its FY2008 report, expressed displeasure with this plan and demanded "a comprehensive nuclear defense and nonproliferation strategy," a detailed description translating that strategy into a "specific nuclear stockpile," and "a comprehensive, long-term expenditure plan, from FY2008 through FY2030..." before considering further funding for Complex 2030 and a nuclear weapon program, the Reliable Replacement Warhead (RRW, discussed below). It stated that "NNSA continues to pursue a policy of rebuilding and modernizing the entire complex *in situ* without any thought given to a sensible strategy for long-term efficiency and consolidation." Similarly, the Senate Appropriations Committee expressed concern with NNSA's plans for the Complex. It saw an inadequate linkage between warheads, the Complex, and strategy, and "rejects the Department's premature deployment of the NNSA Complex 2030 consolidation effort." The joint explanatory statement accompanying the consolidated appropriations bill said, "The Congress agrees to the direction contained in the House and Senate reports requiring the Administration ... to develop and submit to the Congress a comprehensive nuclear weapons strategy for the 21st century."

On December 18, 2007, NNSA announced its plan, Complex Transformation, a name change from Complex 2030. It would retain existing sites, reduce the weapons program footprint by as much as one-third, close or transfer from weapons activities about 600 structures, reduce the number of weapons workers by 20-30%, dismantle weapons more rapidly, and build several major new facilities, such as a Uranium Processing Facility at Y-12 Plant, a Weapons Surveillance Facility at Pantex Plant, and a Chemistry and Metallurgy Research Replacement Nuclear Facility at Los Alamos National Laboratory.[25] This plan is more fully described in a Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement released in January 2008.[26]

Directed Stockpile Work (DSW). This program involves work directly on nuclear weapons in the stockpile, such as monitoring their condition; maintaining them through repairs, refurbishment, life extension, and modifications; R&D in

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[25] U.S. Department of Energy. National Nuclear Security Administration. "NNSA Releases Draft Plan to Transform Nuclear Weapons Complex." Press release, December 18, 2007, at [http://www.nnsa.doe.gov/docs/newsreleases/2007/PR_2007-12-18_NA-07-64.htm]; National Nuclear Security Administration, "Nuclear Weapons Complex Transformation," with links to plans for each site, at [http://www.nnsa.doe.gov/complextransformation.htm]; and Walter Pincus, "Administration Plans to Shrink U.S. Nuclear Arms Program," *Washington Post*, December 19, 2007, p. 1.

[26] This statement and supporting materials are available at [http://www.complex transformationspeis.com/project.html].

support of specific warheads; and dismantlement. Specific items under DSW include the following:

- Life Extension Programs (LEPs). These programs aim to extend the life of existing warheads by 20 to 30 years through design, certification, manufacture, and replacement of components. Two LEPs are underway. One for the B61 mods 7 and 11 bombs will complete actions needed to close out the program in FY2009; its FY2008 budget is $61.9 million, and the FY2009 request is $2.2 million. The other LEP is for the W76 warhead for the Trident II submarine-launched ballistic missile. Its FY2008 budget is $172.2 million, while its FY2009 request is $209.2 million. Work in FY2008 involves preparation for manufacture with a goal of making the first production unit. NNSA plans to ramp to full production in FY2009.

- Stockpile Systems. This program involves routine maintenance, replacement of limited-life components, ongoing assessment, and the like for all weapon types in the stockpile. The FY2008 budget is $340.1 million; the FY2009 request is $338.7 million. Of the eight warhead types listed, the two largest programs under stockpile systems are for the B61 and W76.

- Weapons Dismantlement and Disposition (WDD). The President and Congress have agreed on the desirability of reducing the stockpile to the lowest level consistent with national security, and numbers of warheads have fallen sharply since the end of the Cold War. According to NNSA, "Reducing the total number of U.S. nuclear weapons sends a clear message to the world that critical modernization programs do not signal a return to the arms race of the Cold War." WDD involves interim storage of warheads to be dismantled, dismantlement, and disposition, i.e., storing or eliminating warhead components and materials. The FY2008 budget is $134.7 million; the FY2009 request is $183.7 million. Within WDD, the major activity is the Pit Disassembly and Conversion Facility (PDCF). The "pit" is the fissile component (usually plutonium) of a nuclear warhead that initiates a thermonuclear explosion. As warheads are dismantled, pits may be stored, but for permanent disposition PDCF would convert the plutonium in pits to plutonium oxide for use in a Mixed Oxide Fuel Fabrication Facility (MFFF), where it would become fuel for commercial light-water nuclear reactors. The project also includes a Waste Solidification Building (WSB) to convert liquid wastes from PDCF and MFFF into solids for disposal off-site. (In FY2008, MFFF was transferred from NNSA to DOE's Office of Nuclear Energy. The FY2009 budget request would transfer the project to Other Defense Activities.) In FY2009, NNSA plans to begin construction of WSB and to continue design and technology development for PDCF.

- Stockpile Services. This category includes Production Support; R&D Support; R&D Certification and Safety; Management, Technology, and Production; Pit Manufacturing; and Pit Manufacturing Capability. Under Pit Manufacturing, NNSA plans to manufacture stockpile-quality pits for the W88 warhead at Los Alamos National Laboratory. NNSA established a capacity of 10 pits per year in FY2007, a figure it plans to increase to 50 to 80 pits per year. Closely related is Pit Manufacturing Capability, which develops processes to manufacture pits other than for the W88. The budget for Stockpile Services was $692.4 million for FY2008; $931.9 million is requested for FY2009.

- Reliable Replacement Warhead (RRW). This program seeks to develop a warhead initially to replace W76 warheads. The design would trade characteristics important during the Cold War, notably high warhead yield per unit of warhead weight, for features deemed more important now, such as ease of manufacture, enhanced use denial, reduced cost, and ease of certification without nuclear testing. Supporters assert RRW can meet these goals; critics raise technical concerns, argue that it could spur nuclear proliferation, and hold that the Life Extension Program can maintain existing warheads. Congress eliminated FY2008 funds for developing this warhead. For FY2009, NNSA requests $10.0 million to address certain questions on certifying RRW and to document work completed through FY2007. (See CRS Report RL32929, *The Reliable Replacement Warhead Program: Background and Current Developments*, and CRS Report RL33748, *Nuclear Warheads: The Reliable Replacement Warhead Program and the Life Extension Program*, by Jonathan Medalia.)

Campaigns. These are "multi-year, multi-functional efforts" that "provide specialized scientific knowledge and technical support to the directed stockpile work on the nuclear weapons stockpile." Many items within Campaigns have significance for policy decisions. For example, the Science Campaign's goals include improving the ability to assess warhead performance without nuclear testing, improving readiness to conduct nuclear tests should the need arise, and maintaining the scientific infrastructure of the nuclear weapons laboratories. Campaigns also fund some large experimental facilities, such as the National Ignition Facility at Lawrence Livermore National Laboratory, the Dual-Axis Radiographic Hydrotest Facility at Los Alamos National Laboratory, and the Microsystems and Engineering Sciences Applications Complex at Sandia National Laboratories. The FY2009 request includes five Campaigns:

- Science Campaign. This campaign pursues the science underlying nuclear weapons performance and aging in an effort to better maintain confidence in the U.S. nuclear stockpile. Further, NNSA calls it "the principal mechanism for supporting the science required to maintain the technical vitality of the national nuclear weapons laboratories." Through it, NNSA seeks "a predictive capability for the entire nuclear explosive package by 2020." Congress established

a component of this campaign, Advanced Certification, to improve the ability to certify warheads without testing despite changes to nuclear components. Another component of the Science Campaign is Test Readiness, the ability to conduct nuclear testing should that be deemed necessary. In FY2007, NNSA had achieved the ability to conduct a test within 24 months of an order to do so; because of budgetary pressures, that schedule increased to 24 to 36 months. The FY2008 budget for the Science Campaign is $287.6 million; the FY2009 request is $323.1 million.

- Engineering Campaign. This campaign develops capabilities to assess and improve nonnuclear components of a nuclear warhead. It provides technologies to improve safety, security, and use control of nuclear weapons; develops means to assess weapons design, manufacturing, and certification; provides the means to qualify components to meet requirements for high-radiation environments, such as from missile defenses; and develops capabilities to detect and assess stockpile aging at an early stage. The FY2008 budget for the Engineering Campaign is $169.5 million; the FY2009 request is $142.7 million.

- Inertial Confinement Fusion Ignition and High Yield Campaign. This campaign is developing the tools to create extremely high temperatures and pressures in the laboratory — approaching those of a nuclear explosion — to support weapons-related research and to attract scientific talent to the Stockpile Stewardship Program. The centerpiece of this campaign is the National Ignition Facility (NIF), the world's largest laser. While NIF was controversial in Congress for many years and had significant cost growth and technical problems, completion is expected by March 2009, so the controversy over NIF has waned. The FY2008 budget for this campaign is $470.2 million; the FY2009 request is $421.2 million.

- Advanced Simulation and Computing Campaign. This campaign develops computation-based models of nuclear weapons, which integrate data from other campaigns, past test data, laboratory experiments, and elsewhere to create what NNSA calls "the computational surrogate for nuclear testing," thereby enabling "comprehensive understanding of the entire weapons lifecycle from design to safe processes for dismantlement." It includes funds for hardware and operations as well as for software. Its FY2008 budget is $574.5 million; the FY2009 request is $561.7 million.

- Readiness Campaign. This campaign develops technologies and techniques to improve the safety and efficiency of manufacturing and reduce its costs. Subprograms focus on production of high explosives, nonnuclear components, and weapons components with special materials. Another subprogram, Tritium Readiness, "reestablishes and operates the Departmental capability for producing tritium." (Tritium, an isotope of hydrogen, is used to

increase the explosive force of the first stage of a nuclear weapon.) The FY2008 budget for this campaign is $158.1 million; the FY2009 request is $183.0 million.

Readiness in Technical Base and Facilities (RTBF). This program funds infrastructure and operations at nuclear weapons complex sites. The FY2008 budget is $1,637.4 million, and the FY2008 request is $1,720.5 million. RTBF has six subprograms. By far the largest is Operations of Facilities (FY2008 budget, $1,154.5 million; FY2009 request, $1,212.9 million). Others include Program Readiness, which supports activities occurring at multiple sites or in multiple programs (FY2008 budget, $70.1 million; FY2009 request, $73.8 million); Material Recycle and Recovery, which recovers plutonium, enriched uranium, and tritium from weapons production and disassembly (FY2008 budget, $71.6 million; FY2009 request, $72.5 million); and Construction (FY2008 budget, $285.0 million; FY2009 request, $308.5 million). The most costly and controversial item in Construction is the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (FY2008 budget, $74.1 million; FY2009 request, $100.2 million). CMRR would replace a building about 50 years old that, among other things, houses research into plutonium and supports pit production at Los Alamos. In considering the FY2008 budget, the House Appropriations Committee stated, "Proceeding with the CMRR project as currently designed will strongly prejudice any nuclear complex transformation plan. The CMRR facility has no coherent mission to justify it unless the decision is made to begin an aggressive new nuclear warhead design and pit production mission at Los Alamos National Laboratory." In contrast, the Senate Appropriations Committee stated, "The current authorization basis for the existing CMR [facility] lasts only through 2010, as it does not provide adequate worker safety or containment precautions. However, deep spending cuts ... will likely result in delays that will require the laboratory to continue operations in the existing CMR facility."

Other Programs. Weapons Activities includes several smaller programs in addition to DSW, Campaigns, and RTBF. Among them:

- Secure Transportation Asset: provides for the transport of nuclear weapons, components, and materials safely and securely. It includes special vehicles used for this purpose, communications and other supporting infrastructure, and threat response. The FY2008 budget is $211.5 million; the FY2009 request is $221.1 million.

- Nuclear Weapons Incident Response: provides for use of DOE assets to manage and respond to a nuclear or radiological emergency within the United States or abroad. The FY2008 budget is $158.7 million; the FY2009 request is $221.9 million.

- Facilities and Infrastructure Recapitalization Program (FIRP): "applies new direct appropriations to address an integrated, prioritized series of repair and infrastructure projects focusing on elimination of legacy deferred maintenance that significantly increases the operational efficiency and effectiveness of the NNSA nuclear weapons complex," according to NNSA. Its FY2008 budget

is $180.0 million; its FY2009 request is $169.5 million. One of its subprograms, Facility Disposition, requests no funds for FY2009, vs. an FY2008 budget of $25.0 million, because it will reach its FY2009 goal in FY2008.

- Environmental Projects and Operations: seeks to reduce environmental and health risks at NNSA facilities and surrounding areas by operating and maintaining certain environmental cleanup systems and by conducting long-term environmental monitoring. Its FY2008 budget is $8.6 million; its FY2009 request is $40.6 million.

- Transformation Disposition: eliminates excess NNSA facilities through demolition, transfer, or sale in order to reduce the area (gross square feet) these facilities occupy, thereby reducing costs. It has no funds for FY2008; its FY2009 request is $77.4 million.

- Safeguards and Security (S&S) is split into two elements: Defense Nuclear Security, which provides operations, maintenance, and construction funds for protective forces, physical security systems, personnel security, and the like, and Cyber Security. In the wake of 9/11, the relevant threats and the Design Basis Threat changed. Ambassador Linton Brooks, then Administrator of NNSA, stated in 2005, "We must now consider the distinct possibility of well-armed and competent terrorist suicide teams seeking to gain access to a warhead in order to detonate it in place. This has driven our site security posture from one of 'containment and recovery' of stolen warheads to one of 'denial of any access' to warheads. This change has dramatically increased security costs for 'gates, guns, guards' at our nuclear weapons sites."[27] The cost of S&S is a major concern for Congress and NNSA. Many changes have been proposed to reduce Complex security costs, such as reducing the area to be guarded by reducing the footprint of several sites and by consolidating uranium and plutonium at fewer sites. For Defense Nuclear Security, the FY2008 budget is $765.2 million (after deducting $34.0 million for security work for others), and the FY2009 request is $737.3 million. For Cyber Security, the FY2008 budget is $100.3 million, and the FY2009 request is $122.5 million.

Nonproliferation and National Security Programs. DOE's nonproliferation and national security programs provide technical capabilities to support U.S. efforts to prevent, detect, and counter the spread of nuclear weapons worldwide. These nonproliferation and national security programs are included in the National Nuclear Security Administration (NNSA).

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[27] Statement of Ambassador Linton F. Brooks, Administrator, National Nuclear Security Administration, before the Senate Armed Services Committee Subcommittee on Strategic Forces, April 4, 2005.

Table 14. DOE Defense Nuclear Nonproliferation Programs

($ millions)

Program	FY2008	FY2009 Request	House	Senate	Conf.
Nonproliferation & Verification R&D	$387.2	$275.1			
Nonproliferation & International Security[a]	150.0	140.5			
International Materials Protection, Control and Accounting (MPC&A)	624.5	429.7			
Elimination of Weapons-Grade Plutonium Production	179.9	141.3			
Fissile Materials Disposition[b]	66.2	41.8			
Global Threat Reduction Initiative	193.2	219.6			
Cong. Dir. Projects	56.9	—			
Use of prior year balances[c]	(322.0)	—			
Total	**1,336.0**	**1,247.1**			

Sources: DOE FY2009 Congressional Budget Request.
Note: Numbers may not add due to rounding.
a. Includes funding for two formerly separate programs: Russian Transition Initiatives and HEU Transparency Implementation.
b. Funding for MOX plant transferred to Nuclear Energy, and Pit Disassembly plant to NNSA.
c. From the Russian Fissile Materials Disposition program, MOX construction, and FY1999 emergency supplemental.

Funding for these programs in FY2008 was $1.336 billion, compared to the FY2007 level of $1.683 billion. The reduction reflected moving two major construction projects, the Mixed-Oxide (MOX) plant and the Pit Disassembly plant, from the Fissile Materials Disposition program to other parts of DOE. (See below.) For FY2009, the Administration agreed to move those projects out of the Nonproliferation program, and requested $1.247 billion.

The Nonproliferation and Verification R&D program was funded at $387.2 million for FY2008. The request for FY2009 was $275.1 million.

Nonproliferation and International Security programs include international safeguards, export controls, and treaties and agreements. The FY2009 request for these programs was $140.5 million, compared to $150.0 million appropriated for FY2008.

International Materials Protection, Control and Accounting (MPC&A), which is concerned with reducing the threat posed by unsecured Russian weapons and weapons-usable material, was funded at $624.5 million in FY2008; the FY2009 request is $429.7 million.

The goal of the Fissile Materials Disposition program is disposal of U.S. surplus weapons plutonium by converting it into fuel for commercial power reactors, including construction of a facility to convert the plutonium to "mixed-oxide" (MOX) reactor fuel at Savannah River, South Carolina, and a similar program in Russia. However, funding for the U.S. side of the program has been controversial for several years, because of lack of progress on the program to dispose of Russian plutonium. For FY2008 the Administration requested $609.5 million for Fissile Materials Disposition, including $393.8 million for construction. The House Appropriations Committee, noting that Russia had decided in 2006 not to pursue plutonium disposition in light water MOX reactors but to build fast breeder reactors instead, declared the bilateral agreement a failure and asserted that the $1.7 billion previously appropriated for facilities to be used in the U.S. side of the plutonium disposal agreement was "without any nuclear nonproliferation benefit accrued to the U.S. taxpayer."

The committee recommended transferring the MOX plant and another project, the Pit Disassembly and Conversion Facility (PDCF), both at Savannah River, SC, to the nuclear energy program and NNSA's weapons program respectively. The FY2008 omnibus funding act adopted the House position, transferring the MOX plant and PDCF to other programs. The net appropriation for the NNSA's Fissile Materials Disposition program was reduced to $66.2 million. For FY2009, the Administration requested $41.8 million.

Environmental Management. In the late 1980s, the United States ceased its production of nuclear weapons, due to military projections that the nuclear weapons stockpile was sufficient to protect national security and respond to future threats. Past production of these weapons generated substantial quantities of radioactive and other hazardous wastes, and resulted in contamination of soil, groundwater, and buildings. As a consequence, environmental problems arising from this past production continue to present challenges today. However, potential health and environmental risks vary considerably among individual sites, depending on the type and quantity of waste and contamination present at each site, and the potential for exposure to wastes and contaminants.

The adequacy of funding to address health and environmental risks resulting from the past production of nuclear weapons is a long-standing issue. DOE established the Office of Environmental Management in 1989 to consolidate its efforts to administer the cleanup of former nuclear weapons sites. These efforts include the disposal of radioactive and other hazardous wastes, management and disposal of surplus nuclear materials, the remediation of soil and groundwater contaminated from such wastes, and the decontamination and decommissioning of excess buildings and facilities. Through this management program, DOE also administers the disposal of wastes and remediation of contamination at sites where the federal government conducted civilian nuclear energy research. Altogether, there

were 114 "geographic"[28] sites in 30 states where these activities resulted in the generation of wastes and contamination.

Some of the ongoing issues associated with the disposal of wastes and the cleanup of contamination have been the adequacy of risk-based approaches to address these needs; the technical soundness of waste treatment facility designs; how to safely remove, treat, and dispose of high-level radioactive waste stored in underground tanks; the effectiveness and cost-savings of incentive-based cleanup contracts; and the pace and adequacy of cleanup overall. The challenges of the Environmental Management Program to dispose of wastes and clean up contamination are substantial and require significant resources. As such, this program represents a sizeable portion of DOE's budget, constituting approximately one-fifth of the President's FY2009 budget request for the Department.

President's FY2009 Budget Request. The President has requested a total of $5.53 billion for DOE's Environmental Management Program in FY2009, $166.7 million less than the FY2008 enacted appropriation of $5.70 billion. The request continues a downward trend in overall funding for the program over the past few years. One of the primary reasons for this trend is a decrease in funds for "accelerated closure" sites where all planned cleanup actions are complete, or are nearing completion, under the Environmental Management Program. Congress had increased funding at these sites for several years to speed the pace of cleanup, such as the Rocky Flats site in Colorado and the Fernald site in Ohio. These sites were suitable for accelerated cleanup because the challenges were more technically feasible to address than those at more complex sites. Now that all or most of the work is completed at these sites, there has been a sharp decline in funding as these needs have diminished.

Although DOE has accomplished much in accelerating cleanup at certain sites, substantial challenges persist at many other sites where cleanup is not complete and large quantities of wastes and contamination remain. For these and other pending sites, there are varying decreases and increases in funding when comparing the President's FY2009 request to the appropriation that Congress enacted for FY2008. (See **Table 15**.) These differences can be attributed to many reasons, including differing priorities among other competing needs within the federal budget, opposing views on the adequacy of funding to meet cleanup needs, and varying factors at individual sites, such as the technical complexity of cleanup, the prioritization of remedial actions based on health and environmental risks, and the timing of individual cleanup actions.

Some Members of Congress and states have expressed particular concern that the President's proposed decreases in funding for some sites may delay compliance

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[28] DOE makes a distinction between its "geographic" sites, which represent entire facilities and the lands they occupy, and the thousands of discrete contaminated sites located on each facility that have been, or need to be, cleaned up. One of these geographic sites, the Waste Isolation Pilot Plant in New Mexico, was constructed as a repository to dispose of transuranic radioactive waste from other sites. Although this facility is not a cleanup site, its operation is essential to the cleanup of transuranic waste at many sites where such waste is removed and prepared for permanent disposal off-site.

with cleanup "milestones." These milestones establish time frames (i.e., deadlines) for the completion of individual actions or steps within the cleanup process at each site. They are specified in written agreements among DOE, the Environmental Protection Agency (EPA), and state regulatory agencies. Although these milestones are legally binding, the ability to meet specified deadlines depends upon the availability of funding to carry out necessary actions, the technical feasibility of those actions, and in some cases, the resolution of other regulatory issues upon which a milestone may be based. Consequently, funding alone does not necessarily determine the ability of DOE to comply with the cleanup milestones to which it has agreed.

Of the total sites still in need of cleanup, the Hanford, WA, site is the largest and most complex site administered under the Environmental Management Program. This site alone represents about one-third of the funding for the entire program. The adequacy of funding to clean up Hanford has been particularly controversial for many reasons, including potential risks from radioactive contamination migrating through groundwater into the Columbia River and the delayed construction of the Waste Treatment and Immobilization Plant. This facility is a key element in DOE's plans to treat the substantial volume of high-level radioactive waste to be removed from the underground tanks at Hanford, and to solidify that waste for permanent disposal in a geologic repository. This task is one of the more costly cleanup challenges across the complex of sites.

Various engineering and design issues have delayed construction of the Waste Treatment and Immobilization Plant at Hanford. The President has requested $690.0 million for the construction of this facility for FY2009, an increase above the FY2008 enacted appropriation of $683.7 million. The request also includes $288.4 million for the management of the wastes still stored in the underground tanks, slightly more than the appropriation of $285.8 million enacted for FY2008. Together, the amounts for these activities in each respective year constitute the total funding for the Office of River Protection at Hanford, which addresses potential risks to the Columbia River from the high-level tank wastes.

Table 15 presents the amount of appropriations that Congress enacted for the Environmental Management Program for FY2008, compared with the President's budget request for FY2009. Amounts are indicated for each of the three statutory accounts that fund the Environmental Management Program, and for selected sites and program activities within those accounts in which there has been broad congressional interest. The amounts enacted for FY2008 are as presented in DOE's FY2009 budget justification for the Environmental Management Program, which reflect the across-the-board rescission of 0.91% for ongoing program elements, and 1.6% for congressionally designated projects, as required by the Consolidated Appropriations Act for FY2008 (P.L. 110-161).

Table 15. Environmental Management Program Appropriations

($ millions)

Environmental Management Program Accounts	FY2008 Enacted	FY2009			
		Request	House	Senate	Conference
Defense Environmental Cleanup					
Accelerated Closure Sites	$42.1	$45.9			
Ashtabula	$0.3	$0.0			
Fernald	$0.0	$2.1			
Miamisburg	$30.0	$30.6			
Closure Sites Administration	$11.7	$13.2			
Hanford	$1,856.0	$1,830.2			
Completion Projects	$886.5	$851.8			
Office of River Protection	$969.5	$978.4			
Waste Treatment Plant	*$683.7*	*$690.0*			
Tank Farm Activities	*$285.8*	*$288.4*			
Savannah River Site	$1,131.2	$1,206.4			
Idaho National Laboratory	$508.4	$432.1			
Oak Ridge Reservation	$190.5	$237.7			
Waste Isolation Pilot Plant	$234.6	$211.5			
NNSA Sites	$290.3	$245.1			
Technology Development	$21.2	$32.4			
Safeguards and Security	$259.3	$251.3			
Program Direction	$306.9	$308.8			
Program Support	$32.8	$33.9			
Federal Contribution to Uranium Enrichment D&D Fund [a]	$458.8	$463.0			
Congressionally Directed Projects	$17.2	$0.0			
Subtotal Defense Environmental Cleanup	$5,349.3	$5,298.4			
Non-Defense Environmental Cleanup	$182.3	$214.1			
Uranium Enrichment D&D Fund [a]	$622.2	$480.3			
Uranium Enrichment D&D Fund Offset [a]	$-458.8	$-463.0			
Use of Prior Year Defense	$0.0	$-1.1			

Environmental Management Program Accounts	FY2008 Enacted	FY2009			
		Request	House	Senate	Conference
Use of Prior Year Non-Defense	$0.0	$-0.7			
Total Environmental Management Program	$5,695.0	$5,528.0			

Source: Prepared by the Congressional Research Service using information from the Department of Energy, Office of Chief Financial Officer, *FY2009 Congressional Budget Request*, Volume 5, February 2008. FY2008 enacted amounts reflect applicable rescissions, as reported by the Department of Energy.

a. D&D = Decontamination and Decommissioning. Federal payment to the Uranium Enrichment D&D Fund is typically treated as an offset to the total for the Environmental Management Program.

Estimated Future Funding Needs. The need for annual appropriations of several billion dollars to clean up nuclear waste sites has motivated ongoing concern within Congress about the long-term financial liability of the United States to meet these needs. Accordingly, there has been much debate about how to ensure public health and safety, and the protection of the environment, in the most expedient and cost-effective manner. DOE reports that it had cleaned up 85 of the original 114 geographic sites, as of the end of FY2007.[29] Although DOE has disposed of substantial quantities of waste and remediated many areas of contamination at the remaining sites, much work remains to be done to complete cleanup at many of them.

DOE expects to complete cleanup at many sites within the next several years. However, the Department anticipates cleanup to continue for decades at the larger and more complex sites, such as Hanford, Savannah River, and the Idaho National Laboratory, where high-level radioactive waste is in need of treatment and disposal, and soil and groundwater contamination are generally more severe. Based on its more recent assumptions, DOE expects the cleanup and disposal of wastes to be complete at Savannah River sometime between 2038 and 2040, at the Idaho National Laboratory between 2035 and 2044, and at Hanford between 2050 and 2062.[30] DOE previously had estimated a specific year for the completion of cleanup at each site, but has since revised its estimates to include a range of years over a longer time period for certain sites because of greater uncertainties in its assumptions.

Accurately assessing the time and funding needed to complete cleanup and dispose of all radioactive and other hazardous wastes is difficult at best. Developing reliable estimates is especially challenging for the larger, more complex sites where

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[29] DOE, Office of Chief Financial Officer, *FY2009 Congressional Budget Request*, Volume 5, February 2008, p. 38. DOE referenced 108 geographic sites, as it excluded six sites slated for transfer to the Office of Legacy Management for long-term stewardship. The total of 114 geographic sites noted above includes these six sites to provide a comparison of completed sites to the total number of sites that originally were contaminated.

[30] Ibid., p. 48.

many final decisions have yet to be made because of technical limitations and uncertainties, such as the "end state"[31] of many sites. DOE periodically revises its estimates of the outstanding time and costs to complete cleanup and disposal of wastes as individual project baselines and assumptions change. Similar to the estimated dates of completion, the cost estimates also have varied over time, and by many billions of dollars. DOE reports its financial liabilities for the Environmental Management Program, and all of its other program responsibilities, in its annual financial statements.

DOE's most recent financial statement, for FY2007, estimated that $188.7 billion would be needed to complete cleanup and dispose of wastes at the remaining sites administered under its Environmental Management Program.[32] This estimate is $29.5 billion more than the estimate of $159.2 billion in DOE's FY2006 financial statement.[33] Similar to the increases in the time frame estimates, the higher cost estimate in the FY2007 financial statement is attributed to various factors, such as shifts in individual project baselines and greater uncertainties in the DOE's assumptions. It also should be noted that the Department's cost estimate of $188.7 billion is in FY2007 dollars. The Department noted that "future inflation could cause actual costs to be substantially higher" over time.[34]

In addition to inflation, other factors could cause actual costs to exceed the more recent $188.7 billion estimate. For example, actual costs could be higher than expected, depending on whether federal and state regulators require more stringent and costlier cleanup actions than DOE plans to take. Costs also could rise if initial cleanup actions prove inadequate to protect human health and the environment over the long-term. Future performance of cleanup actions is especially critical for nuclear waste sites because of the rate of decay of radioactivity, which can be thousands of years, depending on the particular radionuclide. Predicting the effectiveness of methods to contain radioactive wastes over such long periods of time is challenging, if not impracticable, in some cases. Consequently, additional funding could be needed at sites where cleanup was thought to be complete, if the initial cleanup proves inadequate over time.

DOE's $188.7 billion estimate also does not include the costs of long-term, "post-closure" care of sites once wastes are disposed of, and cleanup remedies are in place, to ensure the protection of human health and the environment into the future. DOE's FY2007 financial statement estimated that $29.4 billion would be needed for

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[31] DOE uses the term "end state" to denote the intended condition or land use of a contaminated site once cleanup is complete. Determining the end state is critical to making cleanup decisions, as the degree of cleanup required, and the specific action to achieve that degree of cleanup, are dependent on the potential pathways of human exposure that would occur as a result of how the land will be used in the future. Land uses resulting in greater potential for human exposure generally require a greater degree of cleanup.

[32] DOE, *U.S. Department of Energy Agency Financial Report Fiscal Year 2007*, DOE/CF-0022, pp. 61.

[33] DOE, *Performance and Accountability Report Fiscal Year 2006*, DOE/CF-0012, p. 173.

[34] DOE, *U.S. Department of Energy Agency Financial Report Fiscal Year 2007*, DOE/CF-0022, pp. 61.

long-term care of sites after work under its Environmental Management Program is completed.[35] This estimate is $11.2 billion more than the estimate of $18.2 billion in the Department's FY2006 financial statement.[36]

It should be noted that a substantial portion of the increase in the more recent estimate is attributed to a difference in accounting of the estimated costs for the disposal of certain materials, including surplus plutonium. The FY2006 financial statement listed the cost of this responsibility separately, whereas the FY2007 financial statement included it in the estimate for "legacy environmental liabilities" along with long-term site care. Adjusting for this difference in accounting, the estimate of $29.4 billion for legacy environmental liabilities in the FY2007 financial statement is $1.3 billion more than the comparable, prior year estimate of $28.1 billion, when the estimated costs of the disposal of surplus plutonium and other materials are included.

DOE explained that its more recent estimate of $29.4 billion for post-closure site care and other long-term stewardship activities would be incurred over 75 years through FY2082.[37] DOE also assumed that some additional funds would be needed to continue the long-term care of sites beyond this time frame, but stated that such future costs over a lengthy planning horizon "cannot reasonably be estimated."[38] The President's FY2009 budget request for the long-term care of sites administered under DOE's Office of Legacy Management is discussed below.

Office of Legacy Management. Once a site is cleaned up and there is no continuing DOE mission, responsibility for long-term care of the site is transferred to DOE's Office of Legacy Management.[39] This office also manages the payment of pensions and post-retirement benefits of former contractor personnel who worked at these sites.[40] As indicated in **Table 16**, the President has requested a total of $186.0 million for the Office of Legacy Management in FY2009, approximately $2.8 million less than the appropriation of $188.8 million that Congress enacted for FY2008.

The President has proposed to consolidate the funding for this office within DOE's "Other Defense Activities" account, whereas Congress has been appropriating the funding separately for defense and non-defense sites. DOE states that less than 20% of the funding in the FY2009 budget request would be devoted to non-defense sites. Although the President's total request for the Office of Legacy Management

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[35] Ibid.

[36] DOE, *Performance and Accountability Report Fiscal Year 2006*, DOE/CF-0012, p. 173.

[37] DOE, *U.S. Department of Energy Agency Financial Report Fiscal Year 2007*, DOE/CF-0022, pp. 62.

[38] Ibid.

[39] When there is a continuing mission, long-term site care is transferred to the program office within DOE responsible for administering that mission or is the "landlord" of the site.

[40] At sites with a continuing mission, payment of pensions and post-retirement benefits is assigned to the program office within DOE that is responsible for administering that mission or is the "landlord" of the site, rather than the Office of Legacy Management.

is a relatively small decrease below the FY2008 enacted appropriation, the funding needs for the office are likely to grow significantly in future years, as more sites are transferred from the Environmental Management Program for long-term care once cleanup remedies are in place and wastes are disposed of permanently.

Table 16. Office of Legacy Management Appropriations

($ millions)

Type of Site	FY2008 Enacted	FY2009			
		Request	House	Senate	Conf.
Defense	$155.0	$186.0			
Non-defense	$33.9	$0.0			
Total	**$188.8**	**$186.0**			

Source: Prepared by the Congressional Research Service using information from the Department of Energy, Office of Chief Financial Officer, *FY2009 Congressional Budget Request*, Volume 5, February 2008. FY2008 enacted amounts reflect applicable rescissions, as reported by the Department of Energy.

Power Marketing Administrations. DOE's four Power Marketing Administrations (PMAs) — Bonneville Power Administration (BPA), Southeastern Power Administration (SEPA), Southwestern Power Administration (SWPA), and Western Area Power Administration (WAPA) — were established in response to the construction of dams and multipurpose water projects operated by the Bureau of Reclamation and the Army Corps of Engineers. In many cases, conservation and management of water resources — including irrigation, flood control, recreation or other objectives — were the primary purpose of federal projects. However, these facilities often generated electricity to meet project needs; PMAs were established to market the excess power. (For more information, see CRS Report RS22564, *Power Marketing Administrations: Background and Current Issues*, by Nic Lane.)

Priority for PMA power is extended to "preference customers," which include municipal utilities, co-ops, and other "public" bodies. The PMAs sell power to these entities "at the lowest possible rates" consistent with what they describe as "sound business practice." The PMAs are responsible for covering their expenses and for repaying debt and the federal investment in the generating facilities.

The Administration's FY2009 request for the PMAs was $209.1 million (**Table 7**). This is an overall reduction of $8.3 million compared with the FY2008 request. The individual requests for each PMA are: SEPA, $7.4 million; SWPA, $28.4 million; and WAPA, $193.3 million. WAPA figures net to $173.3 million with the inclusion of $3.0 million for the Falcon and Amistad operating and maintenance fund and -$23.0 million for the anticipated difference between expenses and offsetting collections for the Colorado River Basins Power Marketing Fund (CRBPMF). BPA is a self-funded agency under authority granted by P.L. 93-454, the Federal Columbia River Transmission System Act of 1974, and receives no appropriations.

In FY2008 WAPA, SEPA, and SWPA proposed to assign "Agency Rates" to new obligations. The Agency Rate is the rate at which federal corporations and BPA borrow. This proposal was not enacted in FY2008 and was not included in the FY2009 request.

Although BPA receives no annual appropriation, it funds some of its activities from permanent borrowing authority, which was increased in FY2003 from $3.75 billion to $4.45 billion (a $700 million increase). BPA expects to use a net $269 million of borrowing authority in FY2008 ($510 million gross capital requirement minus $241 million in bond repayment) and estimates that it will use a net of $301 million ($560 million need offset by $259 million bond repayment) in FY2009. Any third-party funding agreements for capital projects may further restrict the agency's use of borrowing authority.

BPA has included no administrative proposals in the FY2009 budget request. In FY2008, BPA proposed to use secondary net revenues beyond $500 million to make advance amortization payments to the Treasury on BPA's bond obligations. The Appropriations Committees opposed that proposal and indicated that they hoped the Administration would not pursue a similar proposal in FY2009.[41]

Title IV: Independent Agencies

Independent agencies that receive funding from the Energy and Water Development bill include the Nuclear Regulatory Commission (NRC), the Appalachian Regional Commission (ARC), and the Denali Commission.

Table 17. Energy and Water Development Appropriations Title IV: Independent Agencies

($ millions)

Program	FY2008	FY2009 Request	House	Senate	Conf.
Appalachian Regional Commission	$73.0	$65.0			
Nuclear Regulatory Commission (Revenues) Net NRC (including Insp. Gen.)	926.1 (779.1) 147.0	1,017.0 (855.5) 161.5			
Defense Nuclear Facilities Safety Board	21.9	25.0			
Nuclear Waste Technical Review Board	3.6	4.0			
Denali Commission	21.8	2.0			

[41] *Joint Explanatory Statement to Accompany Consolidated Appropriations Amendment,* p. 56. See [http://www.rules.house.gov/110/text/omni/jes/jesdivc.pdf].

Program	FY2008	FY2009 Request	House	Senate	Conf.
Fed. Coordinator, Alaska Gas Projects	2.3	—			
Delta Regional Authority	11.7	6.0			
Total	**281.3**	**263.5**			

Source: FY2009 Budget Request.

Key Policy Issues — Independent Agencies

Nuclear Regulatory Commission. The Nuclear Regulatory Commission (NRC) requested $1.017 billion for FY2009 (including $9.0 million for the inspector general's office), an increase of $90.9 million from the FY2008 funding level. Major activities conducted by NRC include safety regulation and licensing of commercial nuclear reactors, licensing of nuclear waste facilities, and oversight of nuclear materials users.

The NRC budget request included $237.5 million for new reactor activities, largely to handle anticipated new nuclear power plant license applications. No commercial reactor license applications had been submitted to NRC since the 1970s, but higher fossil fuel prices and incentives provided by the Energy Policy Act of 2005 (P.L. 109-58) prompted electric utilities to announce plans for more than 30 reactor license applications over the next few years, with the first new application submitted September 20, 2007. NRC predicts that 14 reactor license applications will be submitted through FY2008 and seven more during FY2009. NRC's proposed FY2009 budget also included $37.3 million for licensing DOE's planned Yucca Mountain nuclear waste repository, with the expectation that DOE would submit a repository license application in FY2008, although DOE has indicated that the application could be delayed.

For reactor oversight and incident response, NRC's FY2009 budget request included $279.0 million. Those activities include reactor safety inspections, collection and analysis of reactor performance data, and oversight of security exercises. (For more information on protecting licensed nuclear facilities, see CRS Report RL34331, *Nuclear Power Plant Security and Vulnerabilities*, by Mark Holt and Anthony Andrews.)

The Energy Policy Act of 2005 permanently extended a requirement that 90% of NRC's budget be offset by fees on licensees. Not subject to the offset are expenditures from the Nuclear Waste Fund to pay for waste repository licensing, spending on generic homeland security, and DOE defense waste oversight. The offsets in the FY2009 request would result in a net appropriation of $161.5 million.

For Additional Reading

CRS Products

CRS Report RL31975. *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by Pervaze Sheikh and Betsy A. Cody.

CRS Report RL33504. *Water Resources Development Act (WRDA): Corps of Engineers Project Authorization Issues*, by Nicole T. Carter, H. Steven Hughes, Pervaze A. Sheikh and Jeffrey A. Zinn.

CRS Report RL32064. *Army Corps of Engineers Water Resources Projects: Authorization and Appropriations*, by Nicole T. Carter and H. Steven Hughes,

CRS Report RS20866. *The Civil Works Program of the Army Corps of Engineers: A Primer*, by Nicole T. Carter and Betsy A. Cody.

CRS Report RS21331. *Everglades Restoration: Modified Water Deliveries Project*, by Pervaze A. Sheikh.

CRS Report RL31098. *Klamath River Basin Issues: An Overview of Water Use Conflicts*, coordinated by Betsy A. Cody.

CRS Report RL32131. *Phosphorus Mitigation in the Everglades*, by Pervaze A. Sheikh and Barbara Johnson.

CRS Report RS21442. *Hydrogen and Fuel Cell Vehicle R&D: FreedomCAR and the President's Hydrogen Fuel Initiative*, by Brent D. Yacobucci.

CRS Report RL33558. *Nuclear Energy Policy*, by Mark Holt.

CRS Report RL34331. *Nuclear Power Plant Security and Vulnerabilities*, by Mark Holt and Anthony Andrews.

CRS Report RL33461. *Civilian Nuclear Waste Disposal*, by Mark Holt.

CRS Report RL32163. *Radioactive Waste Streams: Waste Classification for Disposal*, by Anthony Andrews.