



Energy and Water Development: FY2009 Appropriations

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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 for FY2009 involving these programs included

- the distribution of Corps appropriations across the agency's authorized planning, 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 Bush Administration's request for funding of DOE's Reliable Replacement Warhead (RRW) nuclear weapons program, which Congress had 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 Bush Administration's Global Nuclear Energy Partnership to supply plutonium-based fuel to other nations (Title III: Nuclear Energy).

In considering the FY2009 budget, both the House and the Senate Appropriations Committees voted to report out an Energy and Water Development appropriations bill. However, neither bill reached the floor in either house. On September 24, 2008, the House passed H.R. 2638, the Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009, which continued appropriations for Energy and Water Development, among other programs, at the FY2008 level (with some exceptions) until March 6, 2009. The bill passed the Senate September 27 and was signed by the President September 30 (P.L. 110-329). An extension through March 11, 2009, was signed March 6, 2009 (P.L. 111-6).

Energy and Water Development funding for all of FY2009 is included in the Omnibus Appropriations Act, 2009 (H.R. 1105/111th Congress). The House passed the measure February 25, 2009, by a vote of 245-178. It was passed by the Senate without amendment on March 10, 2009, following a cloture vote of 62-35. President Obama signed the bill March 11, 2009 (P.L. 111-8).

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Most Recent Developments

The Bush Administration's request for funding Energy and Water Development programs for FY2009, submitted in February 2008, totaled \$31.209 billion, compared with \$30.998 billion appropriated for FY2008. The House Appropriations Committee approved a bill June 25, 2008, that would have appropriated \$33.811 billion for these programs. The Senate's bill, S. 3258, reported by the Appropriations Committee July 14, 2008, would have appropriated \$33.767 billion.

On September 24, 2008, the House passed H.R. 2638, the Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009, which continued appropriations for Energy and Water Development, among other programs, at the FY2008 level (with some exceptions) until March 6, 2009. The bill passed the Senate September 27 and was signed by the President September 30 (P.L. 110-329). An extension through March 11, 2009, was signed March 6, 2009 (P.L. 111-6).

On February 25, 2009, the House passed an Omnibus Appropriations Act for FY2009 (H.R. 1105), which includes funding for nine FY2009 appropriations bills, including Energy and Water Development (Division C). The Senate approved the funding measure on March 10, 2009, without amendment, and President Obama signed it on March 11, 2009 (P.L. 111-8). Prior to that, the Congress passed, and the President signed, the American Recovery and Reinvestment Act of 2009 (P.L. 111-5), which includes FY2009 appropriations for a number of programs funded in the Energy and Water Development appropriations bill.

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	
6/17/08	7/8/08	H.Rept. 110-921		S.Rept. 110-416			2/25/09	3/10/09	P.L. 111-8

The House Appropriations Subcommittee on Energy and Water Development marked up its FY2009 funding bill on June 17, 2008. The full Appropriations Committee approved the bill on June 25 and released the draft report of the subcommittee, along with the text of two amendments adopted by the full committee. However, neither the bill nor the report was assigned a number until December 10, 2008, when the full committee reported out H.R. 7324 (110th) and accompanying report H.Rept. 110-921. The Senate Appropriations Committee reported out S. 3258 (110th) on July 14. The Senate figures in this update are derived from the report on that bill, S.Rept. 110-416. (See **Table 1**.)

The continuing resolution (Division A of P.L. 110-329) funds these programs at the FY2008 rate. Special provisions mandate a 3.9% increase in pay rates for employees (Sec. 142), and an

additional \$250 million for DOE's weatherization program. Sec. 104 prohibits the use of funds to initiate or resume any project or activity for which funds were not available during FY2008. This provision applies to DOE's Reliable Replacement Warhead program, for which no funding was appropriated for FY2008. DOE had requested \$10 million for the program for FY2009, but both the House and the Senate bills would have eliminated the program. (For details, see "Nuclear Weapons Stockpile Stewardship," below.)

Sec. 129 of the continuing resolution appropriates \$7.51 billion to implement Sec. 136 of the Energy Independence and Security Act of 2007 (P.L. 110-140), providing \$25 billion in direct loans to automakers and parts suppliers to build new plants or modify existing plants to produce higher fuel efficiency vehicles and parts.

Division B of P.L. 110-329, the Disaster Relief and Recovery Supplemental Appropriations Act, 2008, appropriated \$2,776.8 million for the Corps for emergencies and for southeast Louisiana projects. (See "Title I: Army Corps of Engineers.")

Energy and water development funding for all of FY2009 is included in the Omnibus Appropriations Act, 2009 (H.R. 1105). The bill was introduced February 23, with an "explanatory statement" printed in the Congressional Record for that day "as if it were a joint explanatory statement of a committee of conference." The House passed the measure February 25, 2009, by a vote of 245-178. It was passed by the Senate without amendment on March 10, 2009, following a cloture vote of 62-35. President Obama signed the bill March 11, 2009 (P.L. 111-8).

Additional FY2009 funding for some energy and water development programs is included in the economic stimulus measure, the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5), signed by the President on February 17, 2009. The ARRA funding is to remain available for obligation through FY2010 (sec. 1603).

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)

FY2002	FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009
25.2	26.1	26.7	30.2 ^a	36.7 ^b	29.4	30.9	33.8

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.

Table 3 lists totals for each of the bill's four titles. It also lists the total of several scorekeeping adjustments. These figures were not available for the House bill or for S. 3258.

Table 3. Energy and Water Development Appropriations Summary
(\$ millions)

Title	FY2008	FY2009 Request	H.R. 7324 (110 th)	S. 3258 (110 th)	P.L. 111-8
Title I: Corps of Engineers	\$5,587.1	\$4,741.0	\$5,331.0	\$5,300.0	\$5,402.4
Title II: CUP & BOR	1,150.9	786.3	957.5	1,126.8	1,117.7
Title III: Department of Energy	24,489.1	25,917.9	27,217.4	27,016.7	26,967.0
Title IV: Independent Agencies	281.3	268.0	305.7	323.5	307.9
E&W Subtotal	31,508.4	31,713.2	33,811.6	33,767.0	33,795.0
Adjustments	(510.1)	(511.3)	NA	NA	(174.0)
E&W Total	30,998.3	31,209.4	NA	NA	33,621.0

Sources: Administration FY2009 budget request; H.Rept. 110-921; S.Rept. 110-416; Explanatory statement to H.R. 1105 (111th).

Note: Details may not add to totals due to rounding.

Tables 4 through 15 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

Regular annual appropriations for the Corps' civil works activities have been augmented since Hurricane Katrina through supplemental appropriations and through the American Recovery and Reinvestment Act of 2009. In 2008, the agency received more than \$9 billion in supplemental funds; these funds are for work related to post-Katrina repair and improvements in coastal Louisiana and for emergency flood response, including the 2008 Midwest flood and Hurricane Ike response. The American Recovery and Reinvestment Act of 2009 provided an additional \$4.6 billion to the agency for FY2009. For the agency's regular annual appropriations, P.L. 111-8 provides \$5.402 billion for FY2009, which is above the Bush Administration's request of \$4.741 billion but below the FY2008 enacted amount of \$5.587.¹ The preliminary budget request for FY2010 is at \$5.1 billion.

Unlike highways and municipal water infrastructure programs, federal funds for the Corps are not distributed to states or projects based on a formula or delivered via a competitive program. Generally around 85% of the appropriations for the Corps' civil works activities is directed to

¹ During the 110th Congress, the House Appropriations Committee recommended a FY2009 budget of \$5.331 billion, and the Senate Appropriations Committee recommended \$5.300 billion.

specific projects. Many of these projects are identified in the budget request and others are added during congressional deliberations of the agency's appropriations. As a result, the agency's funding is often part of the debate over earmarks.

Generally, appropriations are not provided to studies, projects, or activities that have not been previously authorized, typically in a Water Resources Development Act (WRDA). Estimates of the backlog of authorized projects vary from \$11 billion to more than \$80 billion, depending on which projects are included (e.g., those that meet Administration budget criteria, those that have received funding in recent appropriations, those that have never received appropriations). The backlog raises policy questions, such as whether there is a disconnect between the authorization and appropriations process and how to prioritize among authorized activities.

The Bush Administration's approach to the backlog was to limit the number of new starts, i.e., activities not previously funded, and to focus funds on completing a limited number of activities. Congress has generally chosen to distribute the Corps appropriations across a larger set of projects and to initiate a limited number of new starts. P.L. 111-8 continues the use of restrictions and congressional oversight on the Corps' initiation of new starts via reprogramming funds during the fiscal year.

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

(\$ millions)

Program	FY2008^{ab}	FY2009 Request^c	H.R. 7324 (110th)	S. 3258 (110th)	P.L. 111-5 Stimulus	P.L. 111-8
Investigations and Planning	\$167.2	\$91.0	\$142.9	\$166.0	\$25.0	\$168.1
Rescission	—	—	(1.9) ^d	—		
Construction	2,289.3	1,402.0	2,070.0	2,004.5	2,000.0	2141.7
Mississippi River & Tributaries	387.4	240.0	278.0	365.0	375.0	383.8
Operation and Maintenance (O&M)	2,243.6	2,475.0	2,300.0	2,220.0	2,075.0	2201.9
Regulatory	180.0	180.0	180.0	183.0	25.0	183.0
General Expenses	175.0	177.0	177.0	177.0		179.4
FUSRAP ^e	140.0	130.0	140.0	140.0	100.0	140.0
Flood Control & Coastal Emergencies (FC&CE)	0.0	40.0	40.0	40.0		0
Office of the Asst. Secretary of the Army	4.5	6.0	5.0	4.5		4.5
Total Title I	5,587.1	4,741.0	5,331.0	5,300.0	4,600.0	5,402.4

Sources: FY2009 Budget Request, H.Rept. 110-921; S.Rept. 110-416; H.R. 1; H.Rept. 111-16; H.R. 1105 Explanatory Statement.

Note: The sum of line items may not match the total due to rounding.

- a. The Supplemental Appropriations Act of 2008 (P.L. 110-252) provided funds for 2008 disasters and funds starting in FY2009 for improving hurricane protection in coastal Louisiana. The coastal Louisiana funds for the protection around New Orleans is in addition to supplemental funds provided in FY2005, FY2006, and FY2007 in the wake of Hurricane Katrina in 2005. The \$604.5 million in funds for 2008 emergencies, most

notably Midwest flooding in June, were distributed across several accounts: \$61.7 million for Construction, \$17.6 million for Mississippi River and Tributaries, and \$298.3 million for Operation and Maintenance, and \$226.9 million for Flood Control and Coastal Emergencies. The coastal Louisiana funds available beginning FY2009 included \$5,761 million — \$2,835 million for Hurricane Katrina related construction in the New Orleans area, and \$2,962 million for the Flood Control and Coastal Emergencies account for work in coastal Louisiana.

- b. The Disaster Relief and Recovery Supplemental Appropriations Act of 2008 (P.L. 110-329) provided \$2,776.8 million in funds in FY2008 for emergencies and for southeast Louisiana projects. Of the \$1,538.8 million for the Construction account, \$1,500.0 million is to be used to cover the nonfederal cost share for southeast Louisiana projects (until it is repaid over 30 years by the State of Louisiana) and \$38.8 million for emergency repairs caused by natural disasters. The \$82.4 million for the MR&T account is for dredging and repairs of federal projects in response natural disasters. The \$740.0 million for O&M is for dredging and repair of Corps projects related to natural disasters, The \$415.6 million for the FC&CE account is for emergency operations, eligible repairs and other natural disaster response activities.
- c. The FY2009 request reflects a transfer of certain activities from the Corps construction account to its O&M account. The House Committee on Appropriations has rejected this proposal. The figures in the “House” column reflect this decision.
- d. The Committee recommendation reflects a rescission of \$1.9 million appropriated in P.L. 110-161.
- e. “Formerly Utilized Sites Remedial Action Program.” Due to the nature of FUSRAP’s site cleanup activities, it is discussed later in this report under the DOE Environmental Management heading.

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 \$14.3 billion in emergency supplemental appropriations, not through the annual appropriations process. In addition to the post-hurricane emergency repairs, these funds are being used for construction of levees, floodwalls, storm surge barriers, and pump improvements to reduce the hurricane flooding risk to the New Orleans area to a 100-year level of protection (i.e., protection against a storm surge of an intensity that has 1% probability of occurring in a given year) and to restore and complete hurricane protection in surrounding areas to previously authorized levels of protection by 2011.

Of the \$14.3 billion, \$7.3 billion was provided in supplemental appropriations acts in 2008. The Bush Administration included in its FY2009 budget a request for \$5.8 billion in emergency supplemental funds to complete these construction activities and for related purposes. The request said the \$7 billion in previously appropriated funds were insufficient to complete these activities because of increased costs, improved data on costs, and other factors. The Supplemental Appropriations Act of 2008 (P.L. 110-252) provided the requested \$5.8 billion. As proposed by the Administration and enacted in P.L. 110-252, the State of Louisiana would be responsible for \$1.3 billion as its nonfederal cost-share contribution for the work. Subsequently in the Disaster Relief and Recovery Supplemental Appropriations Act of 2008 (P.L. 110-329), Congress provided \$1.5 billion to cover the state’s share until it is repaid over 30 years by the State of Louisiana.

The Bush Administration also proposed as part of its FY2009 budget request legislative language to consolidate the authorities for 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. Although neither P.L. 110-252

nor P.L. 110-329 provides this authority, they provide for flexibility in the expenditure and reprogramming of the funds for southeast Louisiana activities. Corps officials have continued to request coastal Louisiana reprogramming flexibility in order to meet the 2011 goal.

Everglades

The Corps plays a significant coordination role in the restoration of the Central and Southern Florida ecosystem. In addition to funding for Corps activities through Energy and Water Development appropriations, federal activities in the Everglades also are funded through Department of the Interior appropriations bills. Concerns regarding the level of appropriations across the federal agencies and the State of Florida and progress in the restoration effort are discussed in CRS Report RS20702, *South Florida Ecosystem Restoration and the Comprehensive Everglades Restoration Plan*, by (name redacted) and (name redacted).

The Bush Administration requested \$185 million for FY2009; P.L. 111-8 provides \$123 million. The primary cause of the difference is that P.L. 111-8 provides no Corps funding for the Modified Waters Deliveries Project (Mod Waters), instead of the \$50 million requested. P.L. 111-8 instead funds the project through Department of Interior appropriations, which had been the process until recent years. Other components of the Everglades restoration effort receive lower appropriations in P.L. 111-8 than requested; these projects, however, may receive stimulus funds in FY2009, so it is unknown what the total FY2009 appropriations for the Everglades will be. P.L. 111-8 provides \$91.6 million for Central and Southern Florida Project (\$100 million requested), \$28.4 million for Kissimmee River Restoration Project (\$31 million requested), and \$3.5 million for Everglades and South Florida Restoration Projects (\$4 million requested).

Inland Waterway Trust Fund

The Inland Waterway Trust Fund (IWTF) has a looming deficit due to the amount of ongoing work that it funds relative to the collections for the fund. Expenses associated with construction and major rehabilitation of inland waterways is a federal responsibility (i.e., no local cost-share), with 50% of the federal monies coming from the IWTF and 50% from the federal general revenue fund. The IWTF monies derive from a fuel tax imposed on vessels engaged in commercial waterway transportation on designated waterways, plus investment interest on the balance. The collections have been roughly \$100 million, and the outlays more than \$200 million. The Bush Administration proposed replacing the fuel tax with a lockage fee for each barge. P.L. 111-8 neither adopted this proposal nor made other changes to existing law to address the IWTF balance. Instead it funds some projects with IWTF funds; other projects it funds using only general revenue funds and directs that they be brought to a logical stopping point and future work deferred until the IWTF revenue stream is enhanced.

The use of general funds for projects that are intended to be cost shared by those benefiting from them raises fiscal equity issues among some stakeholders. In contrast, the Harbor Maintenance Trust Fund (HMTF) has a \$4.7 billion growing balance. Navigation stakeholders argue that this balance poses the opposite side of the equity concern.

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 (Reclamation) for FY2009. The total request for Title II funding was originally \$961.3 million—\$189.6 million (16%) below FY2008 funding levels. However, President Bush submitted a budget amendment in June 2008 rescinding another \$175 million from Reclamation's budget. The revised total request for Title II is \$786.3 million, 32% below FY2008 appropriations. P.L. 111-8 provides \$1.1 billion for Title II; \$33.1 million less than enacted for FY2008, but \$331.5 million more than requested for FY2009.

**Table 5. Energy and Water Development Appropriations
Title II: Central Utah Project Completion Account**
(\$ millions)

Program	FY2008	FY2009 Request	H,R 7324 (110 th)	S. 3258 (110 th)	P.L. 111-8
Central Utah Project Construction	\$40.4	\$39.4	\$39.4	\$39.4	\$39.4
Mitigation and Conservation Activities	1.0	1.0	1.0	1.0	1.0
Oversight & Administration	1.6	1.6	1.6	1.6	1.6
Total, Central Utah Project	43.0	42.0	42.0	42.0	42.0

Source: FY2009 Budget Request, H.Rept. 110-921; S.Rept. 110-416; H.R. 1105 Explanatory Statement.

**Table 6. Energy and Water Development Appropriations
Title II: Bureau of Reclamation**
(\$ millions)

Program	FY2008	FY2009 Request	H.R. 7324 (110 th)	S. 3258 (110 th)	P.L. 111-8
Water and Related Resources	\$949.9	\$779.3	\$888.0	\$927.3	\$920.3
Policy & Administration	58.8	59.4	54.4	59.4	59.4
CVP Restoration Fund (CVPRF)	59.1	48.6 ^a	56.1 ^b	56.1 ^b	56.1
Calif. Bay-Delta (CALFED)	40.1	32.0	37.0	42.0	40.0
Desert Terminal Lakes Rescission	—	(175.0) ^c	(120.0)	—	
Gross Current Reclamation Authority	1,107.9	744.3	915.5	1,084.8	1,075.8
Total, Title II (CUP & Reclamation)	1,150.9	786.3	957.5	1,126.8	1,117.8

Source: FY2009 Budget Request, H.Rept. 110-921; S.Rept. 110-416; H.R. 1105 Explanatory Statement, Executive Office of the President, Office of Management and Budget, *Estimate #5—FY2009 Budget Amendments: 2010 Decennial Census, FDA, and Office of the Federal Coordinator for Gulf Coast Rebuilding, with Offsets (various agencies)*, June 9, 2008

- a. This figure is Reclamation's net request for the CVPRF, and reflects a legislative proposal (H.R. 4074) for Reclamation to redirect \$7.5 million collected from Friant Division water users to the new San Joaquin River Restoration Fund.
- b. House appropriators indicated that Congress has not enacted the \$7.5 million legislative proposal for the new San Joaquin River Restoration Fund, and directed Reclamation to expend the funds within the anadromous fish screening program. Senate appropriators also note that legislation authorizing a transfer of \$7.5 million to the new San Joaquin River Restoration Fund has not been enacted, but have included language to allow the use of the \$7.5 million under existing authorities in the event that the legislative proposal is not enacted. P.L. 111-8, the FY2009 Omnibus Appropriations Act, directs Reclamation to use the \$7.5 million to undertake existing authorized San Joaquin River Settlement Act activities until such time as new legislation is enacted.
- c. The president proposed a \$175 million rescission to Reclamation's budget on June 9, 2008. See Office of Management and Budget, FY2009 Estimate No. 5.

Central Utah Project and Bureau of Reclamation: Budget In Brief

The Bush Administration requested \$42.0 million for the CUP Completion Account. The amended FY2009 request for Reclamation totals \$744.3 million in gross current budget authority. This amount is \$363.6 million less than enacted for FY2008. The FY2009 request included "offsets" of \$48.3 million for the Central Valley Project (CVP) Restoration Fund (Congress does not list this line item as an offset), as well as a \$175.0 million rescission proposed in a budget amendment submitted by President Bush, yielding a "net" current authority of \$696.0 million for Reclamation. The total amended budget request for Title II funding—Central Utah Project and Reclamation—is \$786.3 million.

The House Committee on Appropriations recommended \$42 million, the amount requested, for CUP funding for FY2009. The Committee's recommendation for Reclamation programs was \$915.5 million, \$171.2 million more than the President's amended FY2009 request. The Committee recommended a \$120.0 million rescission, \$55.0 million lower than the Bush Administration request.

The Senate Committee on Appropriations also recommended \$42 million for FY2009 CUP funding. The Committee's recommendation for the remaining Title II programs was \$1,084.8 million, \$340.5 million more than the amended FY2009 request, and \$169.3 million more than recommended by House appropriators. The Senate did not include a rescission in its recommendations.

P.L. 111-8 includes \$42 million for CUP funding; \$1 million less than enacted for FY2008.

Reclamation'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 Bush Administration requested \$779.3 million for the Water and Related Resources Account for FY2009. This amount is \$170.6 million (18%) less than enacted for FY2008. The House Committee on Appropriations recommended a total of \$888.0 million for the Water and Related Resources account, \$108.7 million above the FY2009 request of \$779.3 million. The Senate Committee on Appropriations recommended \$927.3 million for Water and Related Resources, \$39.3 million more than the House recommendation. P.L. 111-8 provides \$920.3 million for the Water and Related Resources Account; \$29.6 million less than enacted in FY2008.

There are a number of programs whose funding recommendations differ between House and Senate appropriators; however, the single largest difference appears to be for the Pick-Sloan Missouri Basin's Garrison Diversion Unit. For this line item the Senate committee recommended \$64.4 million and the House panel recommended \$18.5 million—a difference of \$45.9 million. P.L. 111-8 provides \$64.4 million, the same as recommended by the Senate.

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, Reclamation. Whereas the Army Corps of Engineers built hundreds of flood control and navigation projects, Reclamation's mission was to develop water supplies, primarily for irrigation to reclaim arid lands in the West. Today, Reclamation 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. Reclamation is the largest wholesale supplier of water in the 17 western states and the second-largest hydroelectric power producer in the nation. Reclamation facilities also provide substantial flood control, recreation, and fish and wildlife benefits. At the same time, operations of Reclamation facilities are often controversial, particularly for their effect on fish and wildlife species and conflicts among competing water users.

CALFED

The Bush Administration requested \$32.0 million for the California Bay-Delta Restoration Account (Bay-Delta, or CALFED) for FY2009. This request is nearly identical to Reclamation's FY2008 request of \$31.8 million, and is approximately \$8.0 million less than the \$40.1 million enacted for FY2008. The bulk of the requested funds is 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.

The House Committee on Appropriations recommended \$37.0 million for CALFED in FY2009. The increase of \$5.0 million in this account matched a \$5.0 million decrease recommended by the Committee for Reclamation's Policy and Administration account. The Senate Committee on Appropriations recommended \$42.0 million for CALFED funding in FY2009. This recommendation is \$10.0 million more than the President's request, and a \$5.0 million increase over the House recommendation. P.L. 111-8 provides \$40.0 million for the CALFED program. (For more information on CALFED, see CRS Report RL31975, *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by (name redacted) and (name redacted).)

San Joaquin River Restoration Fund

Reclamation proposed an allocation of \$17.3 million to the San Joaquin River Restoration Fund in FY2009. The Fund would be authorized by the enactment of Title X of S. 22 (previously 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 and other federal and non-federal sources. In its FY2008

budget request, Reclamation 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 Central Valley Project (CVP) Restoration Fund programs.

For FY2009, House appropriators originally stated that Congress had not enacted legislation authorizing the \$7.5 million proposal for the new San Joaquin River Restoration Fund and directed Reclamation to expend the \$7.5 million in anticipated transferred receipts within its anadromous fish screening program under the CVP Restoration Fund. The Senate Committee on Appropriations had also noted that authorizing legislation for a transfer of \$7.5 million to the new San Joaquin River Restoration Fund had not been enacted and included language to allow the use of the \$7.5 million under Reclamation's existing authorities in the event that the legislative proposal was not enacted. Explanatory text accompanying P.L. 111-8 directs Reclamation to use the \$7.5 million on activities within existing authorities "until such time as the proposed legislation is enacted."

(For more information on the San Joaquin River Restoration Fund, see CRS Report R40125, *Title X of H.R. 146: San Joaquin River Restoration*, by (name redacted) and (name redacted), and CRS Report RL34237, *San Joaquin River Restoration Settlement*, coordinated by (name redacted) and (name redacted).)

Security

Under Reclamation'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 (name redacted).)

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.

The House and Senate Committees on Appropriations each recommended \$29.0 million for site security in FY2009, matching the amount requested by the President. P.L. 111-8 includes \$28 million for site security.

Water for America

Reclamation proposed funding a new program for FY2009. The Water for America Initiative, part of Reclamation's Water and Related Resources budget account, would be a partnership between Reclamation and the U.S. Geological Survey (USGS). Reclamation indicated that the Water for America Initiative was meant to address increased demand, aging infrastructure, and decreased or changed water availability—factors that Reclamation had identified as threats to its ability to

continue to provide water to the West. The initiative would subsume two existing Reclamation programs: Water 2025 and the Water Conservation Field Services program.

Reclamation's funding request for its portion of the program was \$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, was "Enhance Our Nation's Water Knowledge."

Reclamation proposed 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 (two or three comprehensive water supply and demand studies) and investigations (with a focus on analyzing and developing new water supplies). The balance of Reclamation'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 was \$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.

The House and Senate Committees on Appropriations both recommend the amount requested, \$19.0 million, for the Water for America Initiative line item in FY2009. The total request for the Water for America Initiative was \$31.9 million and it is unclear if the \$12.9 million balance of the program is funded. Within Reclamation's budget, \$19.0 million appears under a Water for America line item, while the remaining \$12.9 million is included in programs for endangered species and other activities. House and Senate appropriators fully funded an FY2009 request of \$22.0 million for Endangered Species Recovery Implementation, which may include the endangered species component of Water for America. P.L. 111-8 provides \$15.1 million for the Water for America Initiative line item for FY2009; \$20.1 million is included for Endangered Species Recovery Implementation, although it is not clear how much of this funding may include the endangered species component of Water for America.

Title III: Department of Energy

The Energy and Water Development bill has funded all DOE's programs since FY2005. 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 the bill 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.

The Bush Administration's FY2009 request for DOE programs was \$25.9179 billion, compared with \$24.3780 billion appropriated for FY2008. The House Appropriations Committee recommended \$27.2174 billion, and the Senate Appropriations Committee recommended \$27.0417 billion. P.L. 111-8 funds these programs at \$26.9670 billion.

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

Program	FY2008	FY2009 Request	H.R. 7324 (110th)	S. 3258 (110th)	P.L. 111- 8
Energy Supply & Conservation					
Energy Efficiency & Renewables	\$1,722.4	\$1,255.4	\$2,531.1	\$1,982.3	\$1,928.5
Electricity Delivery & Energy Reliability	138.6	134.0	149.3	166.9	137.0
Nuclear Energy	961.7	853.6	1,238.9	803.0	792.0
Legacy Management	33.9	—	—	—	—
Total, Energy Supply & Conservation	2,856.5	2,243.0	3,919.2	2,998.2	2,857.5
Fossil Energy R&D	742.8	754.0	853.6	876.7	876.3
Clean Coal Technology (Deferral)	(57.0)	—	—	—	—
Naval Petrol. & Oil Shale Reserves	20.3	19.1	19.1	19.1	19.1
Strategic Petroleum Reserve	186.8	344.0	172.6	205.0	205.0
Northeast Home Heating Oil Rsrv.	12.3	9.8	9.8	9.8	9.8
Energy Information Administration	95.5	110.6	120.6	110.6	110.6
Non-Defense Environmental Cleanup	182.3	213.4	257.0	269.4	261.8
Uranium Decontamination and Decommissioning Fund	622.2	480.3	529.3	515.3	535.5
Science					
High Energy Physics	688.3	805.0	805.0	805.0	795.7
Nuclear Physics	432.7	510.1	517.1	510.1	512.1
Basic Energy Sciences	1,269.9	1,568.2	1,599.7	1,415.4	1,572.0
Bio. & Env. R&D	544.4	568.5	578.5	568.5	601.5
Fusion	286.5	493.1	499.1	493.1	402.6
Advanced Scientific Computing	351.2	368.8	378.8	368.8	368.8
Cong. Directed Proj.	123.6	—	39.7	58.5	93.7
Other	326.3	408.4	458.9	391.1	441.3
Adjustments	(5.6)	—	(15.0)	—	(15.0)
Total, Science	4,017.7	4,722.0	4,861.7	4,640.5	4,772.6
Nuclear Waste Disposal	187.3	247.4	247.4	195.4	145.5
Departmental Admin. (net)	148.4	154.8	154.8	154.8	155.3
Office of Inspector General	46.1	51.9	51.9	51.9	51.9
Innovative Technology Loan Guarantee	46.5	380.0	465.0	380.0	465.0

Program	FY2008	FY2009 Request	H.R. 7324 (110 th)	S. 3258 (110 th)	P.L. 111- 8
National Nuclear Security Administration (NNSA)					
Weapons	6,297.5	6,618.1	6,036.6	6,524.6	6,380.0
Nuclear Nonproliferation	1,336.0	1,247.0	1,530.0	1,909.1	1,482.4
Naval Reactors	774.7	828.1	828.1	828.1	828.1
Office of Administrator	402.2	404.1	428.6	404.1	439.2
Total, NNSA	8,810.3	9,097.3	8,823.2	9,665.8	9,129.6
Defense Environmental Cleanup	5,349.3	5,297.3	5,425.2	5,771.5	5,657.3
Other Defense Activities	754.4	1,313.5	826.5	827.5	1,314.1
Defense Nuclear Waste Disposal	199.2	247.4	247.4	193.4	143.0
Total, Defense Activities	15,113.1	15,955.4	15,322.3	16,457.8	16,243.9
Power Marketing Administrations (PMA)					
Southeastern	6.4	7.4	7.4	7.4	7.4
Southwestern	30.2	28.4	28.4	28.4	28.4
Western	228.9	193.3	193.3	218.3	218.3
Falcon & Amistad O&M	2.5	3.0	3.0	3.0	3.0
Total, PMAs	267.9	232.1	232.1	257.1	257.1
FERC	260.4	273.4	273.4	257.1	273.4
(revenues)	(260.4)	(273.4)	(273.4)	(257.1)	(273.4)
Total, Title III	24,378.0	25,917.9	27,217.4	27,041.7	26,967.0

Source: FY2009 Budget Request; House Appropriations Committee draft report; S.Rept. 110-416.

Key Policy Issues—Department of Energy

DOE administers a wide variety of programs with different functions and missions. In the following pages, the most important 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)

President Bush'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."² As part of that effort, the Bush Administration proposed to continue its support for the Advanced Energy Initiative (AEI, an element of the American Competitiveness Initiative),

² The White House. State of the Union 2008. <http://www.whitehouse.gov/news/releases/2008/01/print/20080128-13.html>

which aimed to reduce America's dependence on imported energy sources. The AEI included hydrogen, biofuels, and solar energy initiatives that were supported by programs in EERE.

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." Further, the proposed FY2009 federal budget set a goal of making solar power "cost-competitive with conventional [sources of] electricity by 2015."

DOE's FY2009 request contained \$1,255.4 million for the EERE programs. Compared with the FY2008 appropriation, the FY2009 request would have reduced EERE funding by \$467.0 million, or 27.1%. Three proposed cuts would comprise most of this reduction. First, the request would have eliminated \$186.7 million in congressionally directed assistance. Second, it would have reduced Facilities construction spending by \$57.3 million.³ Third, the request would have cut \$227.2 million in funding to terminate the Weatherization Assistance Program, citing a higher benefit-cost ratio for technology development programs.

Table 8. Energy Efficiency and Renewable Energy Programs
(\$ millions)

Program	FY2007	FY2008	FY2009 Request	House Appr. Cmte.	Senate Appr. Cmte.	P.L. 111-8
Local Gov./Tribal Tech. Demonstration Program	—	—	—	—	50.0	—
Hydrogen Technologies	\$189.5	\$211.1	\$146.2	\$170.0	175.0	169.0
Biomass & Biorefinery Systems	196.3	198.2	225.0	250.0	235.0	217.0
Solar Energy	157.0	168.5	156.1	220.0	229.0	175.0
—Photovoltaics	138.4	136.7	137.1	—	—	—
Wind Energy	48.7	49.5	52.5	53.0	62.5	55.0
Geothermal Technology	5.0	19.8	30.0	50.0	30.0	44.0
Water Power (Hydro/Ocean)	0.0	9.9	3.0	40.0	30.0	40.0
Subtotal, Renew. & Hydrogen	596.5	657.0	612.8	783.0	761.5	700.0
Vehicle Technologies	183.6	213.0	221.1	317.5	293.0	273.2
Building Technologies	103.0	109.0	123.8	168.0	176.5	140.0
Industrial Technologies	55.8	64.4	62.1	100.0	65.1	90.0
Federal Energy Management	19.5	19.8	22.0	30.0	22.0	22.0
Subtotal, Efficiency R&D	361.8	406.3	429.0	615.5	556.6	525.2

³ 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.

Program	FY2007	FY2008	FY2009 Request	House Appr. Cmte.	Senate Appr. Cmte.	P.L. 111-8
Facilities & Infrastructure	107.0	76.2	14.0	33.0	37.0	76.0
Program Management	110.2	114.9	141.8	147.6	136.8	145.8
R&D Subtotal	1,175.5	1,254.3	1,197.6	1,579.1	1,541.9	1,447.0
Federal Assistance						
—Weatherization Grants	204.6	227.2	0.0	250.0	201.2	200.0
—State Energy Grants	58.8	44.1	50.0	50.0	50.0	50.0
—Renewables Deployment	18.4	10.9	8.5	18.0	11.0	16.0
Federal Assistance Subtotal	281.7	282.2	58.5	318.0	262.2	266.0
EISA Assistance Program	—	—	—	500.0	0.0	—
Cong.-Directed Assistance	0.0	186.7	0.0	134.7	124.2	228.8
Prior Year Balances	—	(0.7)	-0.7	-0.7	0.0	-13.2
Total Appropriation	1,457.2	1,722.4	1,255.4	2,531.1	1,928.3	1,928.5
Office of Electricity Delivery & Energy Reliability (OE)	134.4	138.6	134.0	149.3	166.9	137.0

Sources: DOE FY2007 Operating Plan; Joint Explanatory Statement on the Consolidated Appropriations Act of 2008 (Cong. Record, Dec. 17, 2007, p. H15587 and H15940); DOE FY2009 Request; House Appropriations Committee draft report; S.Rept. 110-416; House Report on H.R. 1105.

In contrast to the Administration's request, the House Appropriations Committee recommended \$2,531.1 million for DOE's EERE programs in FY2009. This would have been an \$808.7 million (47%) increase over the FY2008 appropriation and a \$1,275.7 million (102%) increase over the DOE request. Compared with the request, the Committee recommendation would have embraced a \$381.5 million increase for R&D programs. Further, the Committee would have provided \$259.2 million more for energy assistance programs, of which \$250.0 million would have gone to the Weatherization Program—in sharp contrast to DOE's proposal to eliminate it. Also, the Committee recommended \$500.0 million for new assistance programs authorized by the Energy Independence and Security Act (EISA, P.L. 110-140).

As a major initiative, the Committee recommended \$500.0 million as an “initial program investment” for several new programs authorized by EISA. The Energy Efficiency and Conservation Block Grant Program (EISA, §541-548) would have received \$295.0 million in start-up funding. The Renewable Fuel Infrastructure Program (EISA §244) would have received \$25.0 million to begin grant-giving operations. The Advanced Technology Vehicles Manufacturing Program (EISA §136[b]) would have received \$30.0 million for grants to help convert factories to produce more efficient vehicles. Also, \$1 billion in loan authority would be provided for the Advanced Technology Vehicles Manufacturing Incentive Program (EISA §136[d]).

Aside from the \$500.0 million initiative, some additional EISA-related funding would have been provided under the technology programs. The most notable examples were \$25 million for the production of advanced biofuels (EISA §207) under the Biomass and Biorefinery Program and \$33 million for zero net energy commercial buildings (EISA §422) under the Buildings Program.

The Committee recommended \$134.7 million for Congressionally Directed Assistance.

In addition to providing funding recommendations, the House Appropriations Committee report included three policy directives for DOE. First, DOE would be required to report annually on the return on investment for each of the major EERE program funding accounts. Second, DOE would be directed to make up to \$20 million of EERE funds available for “projects at the local level capable of reducing electricity demand.” Each project would involve multiple technologies and public-private partnerships. Priority would go to projects that have a substantial local cost-share, help reduce water use, or curb greenhouse gas emissions. Third, DOE would be required to implement “an aggressive program” of minority outreach at Historically Black Colleges and Universities and at Hispanic Serving Institutions to deepen the recruiting pool of scientific and technical persons available to support the growing renewable energy marketplace.

The Senate Appropriations Committee recommended \$1,928.3 million for EERE, which is \$205.9 million (12.0%) more than the FY2008 appropriation and \$672.9 million (53.6%) more than the request.

Compared with the House Appropriations Committee report, the Senate Appropriations Committee recommended \$602.8 million, or 23.8%, less for EERE programs. The main difference (\$450.0 million) was that the House Appropriations Committee proposed an increase of \$500.0 million for a new EISA Federal Assistance Program, while the Senate Appropriations Committee proposed an increase of \$50.0 million for a new Local Government/Tribal Technology Demonstration Program. Further, the Senate report recommended less funding than the House report for several technology programs. Relative to the House Committee report figures, the Senate Committee report’s proposed decreases for renewable energy R&D included Geothermal (-\$20.0 million), Bioenergy (-\$15.0 million), and Water Energy (-\$10.0 million). The major decreases for energy efficiency included Weatherization (-\$48.8 million), Industrial Technologies (-\$34.9 million), and Vehicle Technologies (-\$24.5 million).

The Senate Appropriations Committee recommended \$124.2 million for Congressionally Directed Projects.

In general, both committee reports recommended higher funding levels than the Bush Administration’s request. In particular, each included more than \$200 million for the Weatherization Program. Both committees disagreed with the DOE request to fund the Asia Pacific Partnership, and neither committee recommended funding it. Both committees called for the Biomass program to emphasize the use of non-food sources for the development of biofuels. The Senate Committee report further stressed R&D efforts to focus on algae as a biofuels source.

The continuing resolution (Division A of P.L. 110-329) funded these programs at the FY2008 rate. Special provisions mandated an additional \$250 million for DOE’s weatherization program and \$7.5 billion to leverage a one-time \$25 billion loan to help U.S. automakers retool facilities to produce advanced technology energy-efficient vehicles.

Electricity Delivery and Energy Reliability

The FY2009 Bush Administration request included \$134.0 million for the Office of Electricity Delivery and Energy Reliability (OE). The House Appropriations Committee recommended \$149.3 million, which would have been \$15.3 million more than the request. The Senate Appropriations Committee recommended \$166.9 million, which would have been \$17.7 million

more than the House Appropriations Committee recommended. For OE congressionally directed projects, the House Committee report called for \$5.3 million, while the Senate Committee report sought \$12.9 million.

Economic Recovery Bill (P.L. 111-5)

The law provides \$16.8 billion for several program accounts under EERE, which must be obligated during FY2009 and FY2010. In particular, it provides \$2.5 billion for the R&D programs, including \$800 million for the Biomass Program, and \$400 million for the Geothermal Program. Further, it provides \$5.0 billion for the Weatherization Grants Program, \$3.1 billion for the State Energy Program, and \$3.2 billion for the Energy Efficiency and Conservation Block Grant Program—a new program authorized by Title V of the Energy Independence and Security Act of 2007 (EISA).

Also, the law provides \$4.5 billion to the Office of Electricity Delivery and Energy Reliability for grid modernization and related technologies, such as electricity storage. That amount includes funds for the smart grid and grid modernization provisions in EISA (Title 13).

P.L. 111-8

P.L. 111-8 appropriates \$1.93 billion for EERE programs. That total amount is nearly identical to the Senate Appropriations Committee's recommendation. However, the amounts for individual programs differ significantly in many cases. Of the \$1.93 billion total, \$228.8 million is for congressionally directed projects. One highlight of the bill is that it provides \$33 million under the Buildings Program to support the Commercial High Performance Buildings Program, which was authorized by EISA. Also, P.L. 111-8 provides \$137.0 million for OE programs. Of that total, \$19.7 million is for congressionally-directed projects.

Nuclear Energy

For nuclear energy research and development—including advanced reactors, fuel cycle technology, nuclear hydrogen production, and infrastructure support—P.L. 111-8 provides \$870.8 million, including \$78.8 million allocated to DOE defense activities. The total nuclear energy funding is \$61.6 million below the comparable request by the Bush Administration.

The House Appropriations Committee had recommended \$1.317 billion for FY2009. DOE had requested \$1.419 billion, about 40% higher than the FY2008 appropriation of \$1.033 billion. Those totals are significantly higher than the P.L. 111-8 levels because they include DOE's mixed-oxide (MOX) fuel fabrication facility to make fuel from surplus weapons plutonium. The FY2009 request included 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 the MOX project. Those activities are funded by various appropriations accounts through DOE's Office of Nuclear Energy.

The Senate Appropriations Committee had voted to fully fund the MOX project at the Administration's request of \$487.0 million but place it under the National Nuclear Security Administration's Office of Defense Nuclear Nonproliferation. As a result, the Senate panel's funding total for the Office of Nuclear Energy was \$803.0 million, \$50.6 million below the comparable request and \$120.1 million above the comparable FY2008 level.

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 sought by the Bush Administration for the Advanced Fuel Cycle Initiative (AFCI) was intended to help implement the Administration's Global Nuclear Energy Partnership (GNEP). GNEP was established to develop technologies for recycling uranium and plutonium from spent nuclear fuel without creating pure plutonium that could be readily 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."⁴ But nuclear opponents dispute DOE's contention that nuclear recycling technology can be made sufficiently proliferation-resistant for widespread use.

The House Appropriations Committee sharply criticized GNEP as "rushed, poorly-defined, expansive, and expensive," and eliminated all funding for the program. On the other hand, the House panel dramatically boosted funding for advanced nuclear reactors, which the Administration had proposed cutting. The Senate Appropriations Committee did not mention GNEP, but provided \$50.3 million of the Administration's proposed \$122.1 million increase for AFCI. The House Appropriations Committee's summary of the Energy and Water portion of P.L. 111-8 describes GNEP as being "zeroed out," although funding for AFCI would be continued.

Nuclear Power 2010

President Bush's specific mention of "emissions-free nuclear power" in his 2008 State of the Union address reiterated his 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 would be used to accelerate the first-of-a-kind design activities for the two reactors being planned by the two industry consortia, the Westinghouse AP1000 reactor and the General Electric Economic Simplified Boiling Water Reactor (ESBWR). The House Appropriations Committee recommended holding the program's FY2009 funding level to \$157.3 million, which the panel said was DOE's previous planning level. The Senate Appropriations Committee recommended the full request. P.L. 111-8 provides \$177.5 million, \$84.1 million below the request but \$43.7 million above the FY2008 level.

⁴ Department of Energy, *FY 2009 Congressional Budget Request*, February 2008, Vol. 3, p. 691.

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, the Nuclear Regulatory Commission (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.

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 was \$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. The House Appropriations Committee had recommended an increase to \$200.0 million, while the Senate panel had recommended the requested level. P.L. 111-8 provides \$177.5 million.

Most of the FY2009 request—\$59.5 million—was 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. 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. The House Appropriations Committee provided \$196.0 million “to accelerate work” on NGNP—all but \$4.0 million of the Committee’s total funding level for the Generation IV program. P.L. 111-8 allocates \$169.0 million of Generation IV funding for NGNP.

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.

Advanced Fuel Cycle Initiative

According to the DOE budget justification, AFCI is intended to 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 is planned to 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.

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

The House Appropriations Committee had recommended cutting AFCI to \$90.0 million in FY2009, eliminating all funding for GNEP. The remaining funds would be used for research on advanced fuel cycle technology, but none could be used for design or construction of new facilities. The Committee urged DOE to continue coordinating its fuel cycle research with other countries that already have spent fuel recycling capability, but not with "countries aspiring to have nuclear capabilities." The Senate Appropriations Committee had recommended \$229.7 million for AFCI, focusing on advanced fuel separation and fuel fabrication. P.L. 111-8 provides \$145.0 million for the program and eliminate GNEP funding.

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, as did the House Appropriations Committee for FY2009.

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 the high radioactivity of the plutonium mixtures would make the material 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.”⁵

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.⁶

As part of GNEP, AFCI has been 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). The House Appropriations Committee had recommended no FY2009 funding for the ABR, although it is not directly mentioned in the H.R. 1105 explanatory statement. (For more information about GNEP and reprocessing, see CRS Report RL34579, *Advanced Nuclear Power and Fuel Cycle Technologies: Outlook and Policy Options*, by (name redacted).)

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. The House Appropriations Committee had provided the full FY2009 request, while the Senate panel had recommended \$10.0 million—slightly above the FY2008 level. P.L. 111-8 provides \$7.5 million. 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 proposed to shift the program’s funding to the Other Defense Activities account. The House Appropriations Committee had provided the full request, but recommended that the funding remain under the nuclear energy account. The Senate Appropriations Committee also recommended the full request but transferred the project back to the nuclear nonproliferation program. (For more details, see Nuclear Weapons Stockpile Stewardship, below.)

Integrated University Program

The Senate Appropriations Committee recommended the establishment of an Integrated University Program to support university research in the nuclear field and to provide grants to

⁵ See GNEP website at <http://www.gnep.energy.gov>

⁶ National Academy of Sciences, *Review of DOE’s Nuclear Energy Research and Development Program*, prepublication draft, October 2007.

help maintain university nuclear science and engineering programs. Under the Committee recommendation, \$15.0 million each would be appropriated to the Office of Nuclear Energy, the Office of Defense Nuclear Nonproliferation, and the Nuclear Regulatory Commission, for a total of \$45.0 million. P.L. 111-8 provides the entire \$15.0 million to the Nuclear Regulatory Commission.

Fossil Energy Research, Development, and Demonstration

The Bush Administration requested \$765.3 million for the Fossil Energy Research and Development budget in FY2009, to be offset by use of \$11.3 million in prior-year balances (resulting in a requested appropriation of \$754 million). The administration requested \$149 million deferred as unobligated balances to FY2009, and \$166 million in uncommitted balances to be transferred from Clean Coal Technology to Fossil Energy R&D (FutureGen). The total request represented a 33% increase over the FY2008 request of \$566.8. 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. (Contending that research-center-sponsored work can seek 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.

The former FutureGen project was intended to demonstrate clean coal-based Integrated Gasification Combined Cycle (IGCC) power generation with capture and sequestration of CO₂ emissions. In early 2008, after cost estimates for the project escalated to \$1.8 billion, DOE announced that it would restructure the program to focus exclusively on commercial application of Carbon Capture and Storage (CCS) technologies for IGCC or other advanced clean coal-based power generation technology.⁷ Under the “Restructured FutureGen” program, DOE proposed a cost-shared collaboration with industry and anticipated making a number of awards ranging from \$100 million-\$600 million (DOE share). The House Appropriations Committee directed DOE to merge FutureGen and the Clean Coal Power Initiative into a single solicitation for a Carbon Capture Demonstration Initiative and established it as new appropriations control level.

The House Appropriations Committee then recommended \$853.6 million for Fossil Energy Research and Development Programs, a 13.8% increase over the request, of which \$149 million would be derived by transfer from prior-year unobligated Clean Coal Technology balances (deferred earlier by the Consolidated Appropriations Act of 2008, P.L. 110-161), and \$11.3 million in prior-year balances from completed or cancelled construction projects. Major funding categories include the newly created Carbon Capture Demonstration Initiative (\$241 million), which consolidates the former Clean Coal Power Initiative and the FutureGen project; Carbon Sequestration (\$220 million); Fuels and Power Systems (\$220.6 million); Petroleum-Oil Technologies (\$3 million); Natural Gas Technologies (\$25 million); Liquefied Natural Gas Report; Program Direction (\$126.3 million); Other (\$15.4 million); and Congressionally Directed Projects (\$13.7 million).

⁷ Announced June 24, 2008, in Funding Opportunity Number DE-PS26-08NT00496.

The Senate Committee on Appropriations, in its report accompanying S. 3258, recommended increasing the President's budget request by \$122.7 billion to accelerate Carbon Sequestration development for a total of \$876.7 billion. The Committee recommended spending \$232.3 million on the Clean Coal Power Initiative; no funding of the FutureGen account; \$412.1 million on Fuels and Power Systems; \$20 million on Natural Gas Technologies; \$5 million on Oil Technologies; \$152.8 million on Program Direction; \$9.7 million on Other Programs, and \$32.7 million on congressionally directed programs.

Under P.L. 111-8, \$876.3 million is appropriated for fossil energy research and development, of which \$149.0 million is to be derived by transfer from Clean Coal Technology. Of that total, \$288.2 million is available for the Clean Coal Power Initiative Round III solicitation. Furthermore, \$43.9 million of the appropriated amount is to be used for projects specified as Congressionally Directed Fossil Energy Projects.

An additional \$3.4 billion was appropriated for DOE fossil energy programs in FY2009 by the American Recovery and Investment Act of 2009 (P.L. 111-5). Funds under this heading include \$1.0 billion for fossil energy research and development programs; \$800.0 million for additional amounts for the Clean Coal Power Initiative Round III Funding Opportunity Announcement; \$1.52 billion for a competitive solicitation for a range of industrial carbon capture and energy efficiency improvement projects, including a small allocation for innovative concepts for beneficial CO₂ reuse; \$50.0 million for a competitive solicitation for site characterization activities in geologic formations; \$20.0 million for geologic sequestration training and research grants; and \$10.0 million for program direction.

Table 9. Fossil Energy Research and Development
(\$ millions)

	FY2008 Request	FY2008 Approp.^a	FY2009 Request	FY2009 House	FY2009 Senate	P.L. 111-8	P.L. 111-5
CLEAN COAL TECHNOLOGY							
Deferred Unobligated Balance			149.0		149.0	149.0	
Transfer to Fossil Energy R&D			-149.0		-149.0	-149.0	
FOSSIL ENERGY R&D PROGRAM							1,000.0
Clean Coal Power Initiative	73.0	70.0	85.0	0.0	232.3	288.2	800.0
FutureGen	108.0	75.0	156.0	0.0	0.0	0.0	
FUELS AND POWER SYSTEMS							
Innovations for Existing Plants		36.4	40.0	40.0	50.0	50.0	
Advanced IGCC		54.0	69.0	60.0	63.0	85.3	
Advanced Turbines		24.0	28.0	24.0	30.0	28.0	
Carbon Sequestration		120.0	149.1	—	149.1	150.0	

	FY2008 Request	FY2008 Approp.^a	FY2009 Request	FY2009 House	FY2009 Senate	P.L. 111-8	P.L. 111-5
Fuels		25.0	10.0	10.0	30.0	25.0	
Fuel Cell		56.0	60.0	60.0	60.0	58.0	
Advanced Research		37.5	26.6	26.6	30.0	28.0	
Subtotal	245.6	352.9	382.7	220.6	412.1	692.4	
Carbon Sequestration (new)				220.0			
Site Characterization							50.0
Training & Grants							20.0
Carbon Capture Demo. Int. (new)				241.0			1,520.0
Natural Gas Technologies	—	20.0	0.0	25.0	20.0	20.0	
Petroleum-Oil Technologies							
Stripper Well Consortium		1.5		1.0	3.8		
Risk based Data Management		1.2		2.0	1.2		
Subtotal	—	5.0	0.0	3.0	5.0	5.0	
Program Direction	130.0	150.0	126.2	126.2	152.8	152.0	10.0
OTHER							
Plant and Capital Equipment	—	13.0	5.0	5.0	17.7	18.0	
Fossil Energy Environ. Restoration	9.6	9.6	9.7	9.7	9.7	9.7	
Special Recruitment Program	0.6	0.6	0.6	0.6	0.6	0.7	
Cooperative R&D		5.0	—	—	5.0	5.0	
Subtotal	10.2	28.2	15.3	15.3	33.0	33.4	
CONG. DIRECTED PROJECTS	—	48.0	—	13.7	32.7	43.9	
Prior Year balance			-11.3	-11.3	-11.3	70.3	
Total	566.8	750.0(a)	754.0	853.6	876.7	876.3	3,400.0

a. Does not reflect a 0.91% across-the-board rescission in accordance with P.L. 110-161, The Consolidated Appropriations Act, 2008.

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. The NHOR houses 2 million barrels of home heating oil in above-ground facilities in Connecticut, New Jersey, and Rhode Island.

Appropriations for the purchase of oil for the SPR ceased in the mid-1990s. Beginning in FY1999, any fill of the SPR was with deliveries of royalty-in-kind (RIK) oil to the SPR, in lieu of cash royalties on offshore production paid to the federal government. Through FY2007, royalty-in-kind deliveries to the SPR totaled roughly 140 million barrels and forgone receipts to the Department of the Interior were estimated at \$4.6 billion. DOE estimated that deliveries of RIK oil during FY2008 would be roughly 19.1 million barrels and \$1.170 billion in forgone revenues. However, on May 13, 2008, the House and Senate passed H.R. 6022, suspending RIK fill. President Bush signed the legislation into law (P.L. 110-232) on May 19. A few days earlier, on May 16, DOE announced it would not accept bids for an additional 13 million barrels of RIK oil that had been intended for delivery during the second half of 2008.

The Bush Administration request for FY2009 for the SPR was \$346.9 million. As in its FY2008 request, the Administration was seeking funding to expand the capacity of the SPR to 1 billion barrels by (1) adding 115 million barrels of capacity at three existing sites; and (2) establishing a new site, in Richton, Mississippi, where 160 million barrels of capacity would be created. The request included \$169.7 million for expansion activities.

Included as well in the request was \$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 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. Congress approved funding of \$186.8 million for FY2008; the Administration had requested \$331.6 million.

In its report on the FY2008 appropriations bill, the House Committee on Appropriations noted an estimate that it would cost \$10 billion to create additional capacity and \$105 billion to fill it, and that expansion would not be completed until 2027. The Committee indicated that the benefits of doubling the size of the Reserve were not “commensurate with this enormous cost.” For FY2009, the Committee did not alter its position. The Committee recommended funding for FY2009 at \$172.6 million, including the use of \$2.9 million of prior year balances. The recommendation is \$171.4 million less than the Administration request.

The Senate Committee on Appropriations recommended \$205 million for FY2009, including \$31.5 million “to initiate new site expansion activities and support beyond land acquisition.” This would include further work at the Richton site to prepare for the creation of storage capacity.

The Bush Administration 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. Both House and Senate committees agreed to the Administration request.

P.L. 111-8 sets spending for the SPR at the levels recommended by the Senate, as well as providing \$9.8 million for the NHOR, as requested.

Science and ARPA-E

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.⁸ The America COMPETES Act (P.L. 110-69) authorized the establishment of a new Advanced Research Projects Agency—Energy (ARPA-E), separate from the Office of Science, to support transformational energy technology research projects.⁹

For FY2009, DOE requested \$4.722 billion for Science, an increase of 18% from the FY2008 amount of \$4.018 billion. This unusually large increase reflects the American Competitiveness Initiative (ACI), which President Bush had 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. In the 110th Congress, the House Appropriations Committee recommended \$4.862 billion for Science, and the Senate panel recommended \$4.640 billion. The American Recovery and Reinvestment Act of 2009 (P.L. 111-5) appropriated \$1.6 billion for the Office of Science for FY2009 (with no allocation specified to particular programs) and \$400 million for the newly established ARPA-E. P.L. 111-8 provides \$4.773 billion for Science, including \$15 million for ARPA-E and the remainder for the Office of Science.

The requested funding for the largest Office of Science program, basic energy sciences, was \$1.568 billion, up 23% from FY2008. Increases included \$153 million for a new program of Energy Frontier Research Centers,¹⁰ \$66 million to initiate construction of the National Synchrotron Light Source II (NSLS-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 appropriations. (The request also included increases to expand facility operating time in some of the other Office of Science research programs.) In the 110th Congress, the House committee recommended \$1.600 billion, including increases of \$17 million for a facility at the Stanford Linear Accelerator Center and \$14.5 million for the NSLS-II, and the Senate committee recommended \$1.415 billion, including a transfer of \$59 million of basic solar research to the Energy Efficiency and Renewable Energy account and an unspecified reduction of \$93 million. P.L. 111-8 provides \$1.572 billion, including an increase of about \$9 million for the Experimental Program to Stimulate Competitive Research (EPSCoR).

For high-energy physics, the request was \$805 million, up 17% from FY2008. Included were 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

⁸ Based on preliminary FY2007 data from Tables 29 and 22 of National Science Foundation, Division of Science Resources Statistics, *Federal Funds for Research and Development: Fiscal Years 2005-07*, NSF 09-300 (November 2008).

⁹ For more information, see CRS Report RL34497, *Advanced Research Projects Agency - Energy (ARPA-E): Background, Status, and Selected Issues for Congress*, by (name redacted).

¹⁰ 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*, at http://www.sc.doe.gov/bes/reports/files/GC_rpt.pdf.

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 included \$10 million for the DOE/NASA Joint Dark Energy Mission (JDEM).

Responding to appropriations report language in FY2008, NASA included its portion of JDEM in its FY2009 request. In the 110th Congress, the House and Senate committees both recommended the requested amount for high-energy physics. P.L. 111-8 provides \$796 million.

The request for biological and environmental research was \$569 million, up 4%. The bulk of the requested increase was for climate change modeling. In the 110th Congress, the House committee recommended \$579 million, including increases of \$5 million each for biological research and climate change research, and the Senate committee recommended \$599 million, including increases of \$20 million for climate change research and \$10 million for nuclear medicine. P.L. 111-8 provides \$602 million, including increases of \$23 million for climate change research and \$10 million for nuclear medicine.

For nuclear physics, the request was \$510 million, up 18% from FY2008. Included were \$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. In the 110th Congress, the House committee recommended \$517 million, including an increase of \$7 million to accelerate the CEBAF upgrade, and the Senate committee recommended the requested amount. P.L. 111-8 provides \$512 million.

The request for fusion energy sciences was \$493 million, up 72%. Almost the entire increase (\$204 million) was 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, the lack of U.S. funds in FY2008 had 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.¹¹ 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. In the 110th Congress, the House committee recommended \$499 million, including a \$6 million increase above the request to "help revitalize the domestic fusion energy sciences program," and the Senate committee recommended the requested amount. P.L. 111-8 provides \$403 million, including \$90 million less than the request for ITER and no funding for National Compact Stellarator Experiment (NCSX) project, which is currently under construction at Princeton Plasma Physics Laboratory.

The request for the smallest of the Office of Science research programs, advanced scientific computing research, was \$369 million, up 5% from FY2008. The majority of the requested increase would fund establishment of a new Applied Mathematics-Computer Science Institute. In the 110th Congress, the House committee recommended \$379 million, an increase of \$10 million,

¹¹ Dennis Normile, "U.S. Wavers Again on ITER," *ScienceNOW Daily News*, December 21, 2007, <http://sciencenow.sciencemag.org/cgi/content/full/2007/1221/1>.

and the Senate committee recommended the requested amount. P.L. 111-8 provides the requested amount.

The request for laboratory infrastructure was \$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. In the 110th Congress, the House committee recommended \$146 million, including increases for excess facilities disposition, laboratory facility modernization, and building construction, and the Senate committee recommended the requested amount. P.L. 111-8 provides \$145 million.

In the 110th Congress, the House committee recommended \$15 million for ARPA-E as part of the Science appropriation; the Senate committee did not mention ARPA-E. The American Recovery and Reinvestment Act of 2009 provided \$400 million as a separate appropriations account. P.L. 111-8 provides \$15 million as part of the Science appropriation.

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 was \$494.7 million; the House Appropriations Committee had approved the full amount, and the Senate Appropriations Committee had recommended \$388.4 million. P.L. 111-8 cuts the program's budget to \$288.4 million—\$206 million below the Bush Administration request and \$98.1 million below the FY2008 level.

The FY2009 request was 28% above the FY2008 appropriation of \$386.4 million, but the FY2008 level is about \$50 million below the FY2007 level and more than \$100 million below the Administration's FY2008 request. The FY2008 funding reductions required OCRWM to reduce its workforce by about 900, according to the program's director, and DOE pushed back its most optimistic date for opening the Yucca Mountain repository from 2017 to 2020. Despite the reduced funding and staff, OCRWM achieved a major milestone by submitting a license application for the proposed repository to the Nuclear Regulatory Commission on June 3, 2008.

The deep funding cut in P.L. 111-8 for FY2009 appears to reflect the Obama Administration's budget outline for FY2010, in which DOE's nuclear waste funding would be "scaled back to those costs necessary to answer inquiries from the Nuclear Regulatory Commission" during its consideration of the Yucca Mountain license application.¹²

Funding for the nuclear waste 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 House Appropriations Committee had recommended the full amount for both accounts, while the Senate panel had recommended \$195.4 million from the Waste Disposal account and \$193.0 million from the defense account.

¹² Office of Management and Budget, *A New Era of Responsibility: the 2010 Budget*, February 26, 2009, p. 65, <http://www.whitehouse.gov/omb>.

P.L. 111-8 provides \$145.4 million from the Nuclear Waste Fund and \$143 million from the defense account.

The Nuclear Waste Policy Act of 1982 (NWPAct, 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.

NWPAct 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 \$11 billion if Yucca Mountain begins receiving waste by 2020.¹³ (For more information, see CRS Report R40202, *Nuclear Waste Disposal: Alternatives to Yucca Mountain*, by (name redacted), and CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by (name redacted).)

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 consolidated appropriations 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 was for nuclear power plants, \$6 billion was for coal projects that incorporate carbon capture and sequestration, \$2 billion was for advanced coal gasification, \$10 billion was 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 proposed 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 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.

The House Appropriations Committee had recommended an increase in DOE's loan guarantee authority to \$47 billion, all to be available through FY2011, in addition to the previously authorized \$4 billion. Of the \$47 billion, \$18.5 billion was for nuclear power, \$18.5 was for energy efficiency and renewables, \$6 billion was for coal, \$2 billion was for carbon capture and sequestration, and \$2 billion was for uranium enrichment. The House panel provided the full \$19.9 million administrative funding request, to be offset by fees. The Senate Appropriations

¹³ Statement of Edward F. Sproat III, Director of the Office of Civilian Radioactive Waste Management, Before the House Budget Committee, October 4, 2007.

Committee did not increase the \$38.5 billion in loan guarantees authorized in the FY2008 funding act, but recommended that the time limits be removed entirely.

P.L. 111-8 adopts the House Committee level of \$47 billion, in addition to the previously approved \$4 billion. Allocations among technologies are the same as the House Committee recommendation. As in the Senate recommendation, the time limits on the loan guarantee authority are eliminated. Administrative funding of \$19.9 million is provided.

Because of Congressional Budget Office scoring requirements, the House panel provided \$465 million in budget authority (including \$25 million in advance appropriations from FY2008) to cover possible future government costs resulting from the loan guarantees. The Senate Appropriations Committee included \$355 million for that purpose. P.L. 111-8 adopts the House Committee level.

An additional \$60 billion in loan guarantees for renewable energy and electric transmission projects was provided by the economic stimulus legislation (P.L. 111-5). Unlike under the annual appropriations bills, project sponsors under P.L. 111-5 will not have to pay up-front fees to cover potential loan defaults; instead, \$6 billion was appropriated to cover such potential costs. In addition, P.L. 111-5 provided \$10 million for administrative expenses for DOE loans to the U.S. auto industry for advanced vehicle manufacturing.

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 10** 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 10. Funding for Weapons Activities

(\$ millions)

Program	FY2008 Approp.	FY2009 Request	P.L. 111-8
DSW	1,401.3	1,675.7	1,590.2
Campaigns	1,873.7	1,631.7	1,620.4
RTBF	1,637.4	1,720.5	1,674.4
Other ^a	1,385.0	1,589.9	1,495.1
Total	6,297.5	6,618.1	6,380.0

Sources: DOE FY2009 Congressional Budget Request, vol. 1 (NNSA), p. 71; House Appropriations Committee, Energy and Water Development Appropriations Bill, 2009, unnumbered committee print, June 2008, pp. 159-163; Senate Appropriations Committee, Energy and Water Development Appropriations Bill, 2009, S.Rept. 110-416, July 14, 2008, pp. 145-149; and joint explanatory statement for H.R. 1105, Omnibus Appropriations Act, FY2009, as listed on House Rules Committee website on February 26, 2009.

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 11**).

Table 11. 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*, by (name redacted) et al.) 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.¹⁴ This plan is more fully described in a Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement released in January 2008.¹⁵

The House Appropriations Committee reiterated its FY2008 views in its FY2009 report:

Before the Committee will consider funding for most new programs, substantial changes to the existing nuclear weapons complex, or funding for the RRW, the Committee insists that the following sequence be completed:

- (1) replacement of Cold War strategies with a 21st Century nuclear deterrent strategy sharply focused on today’s and tomorrow’s threats, and capable of serving the national security needs of future Administrations and future Congresses without need for nuclear testing;
- (2) determination of the size and nature of the nuclear stockpile sufficient to serve that strategy;

¹⁴ 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.

¹⁵ For the full text of the supplemental programmatic environmental impact statement (SPEIS) and supporting documents, see U.S. Department of Energy. National Nuclear Security Administration. “Complex Transformation SPEIS,” at <http://www.complexttransformationspeis.com/project.html>.

(3) determination of the size and nature of the nuclear weapons complex needed to support that future stockpile.¹⁶

In keeping with this approach, the committee recommended eliminating funds for RRW and for several programs described below. P.L. 111-8 provided no funds for RRW.

In its FY2009 report, the Senate Appropriations Committee recommended eliminating funds for RRW and made various changes to individual programs. It did not provide general comments on Complex transformation.

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 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 was \$61.9 million, and the FY2009 request was \$2.2 million. The other LEP is for the W76 warhead for the Trident II submarine-launched ballistic missile. Its FY2008 budget was \$172.2 million, while its FY2009 request was \$209.2 million. Work in FY2008 involved preparation for manufacture with a goal of making the first production unit. NNSA plans to ramp to full production in FY2009, and the first life-extended W76 entered the stockpile in February 2009.¹⁷ P.L. 111-8 provided \$205.0 million.
- **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 was \$340.1 million; the FY2009 request was \$338.7 million. Of the eight warhead types listed, the two largest programs under stockpile systems are for the B61 and W76. P.L. 111-8 provided \$328.5 million.
- **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 was \$134.7 million; the FY2009 request was \$183.7 million. P.L. 111-8 provided \$190.2 million. Within WDD, the major activity is the Pit

¹⁶ U.S. Congress. House. Committee on Appropriations. *Energy and Water Development Appropriations Bill, 2009*, unnumbered committee print, June 2008, pp. 123-124.

¹⁷ U.S. Department of Energy. National Nuclear Security Administration, "Refurbished W76 Warhead Enters U.S. Nuclear Weapon Stockpile," press release, February 23, 2009, <http://nnsa.energy.gov/2286.htm>.

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 was requested for FY2009. P.L. 111-8 provided \$866.4 million.
- **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 requested \$10.0 million to address certain questions on certifying RRW and to document work completed through FY2007. P.L. 111-8 provided no funds for RRW. (See CRS Report RL32929, *The Reliable Replacement Warhead Program: Background and Current Developments*, by Jonathan Medalia, and CRS Report RL33748, *Nuclear Warheads: The Reliable Replacement Warhead Program and the Life Extension Program*, by Jonathan Medalia.)

In its report on FY2009 energy-water appropriations, the House Appropriations Committee recommended providing the requested funds for Life Extension Programs and Stockpile Systems. It recommended increasing Weapons Dismantlement and Disposition funds by \$6.0 million, mainly to examine a capability with which an existing facility at Nevada Test Site could dismantle “small numbers of troublesome individual warheads” without interfering with large-scale dismantlement at Pantex. It recommended reducing Stockpile Services by \$273.1 million to the level that the House passed for FY2008. It recommended eliminating RRW funds:

The Committee supports trading off Cold War high yield [in nuclear warheads] for improved reliability, in order to move to a smaller stockpile requiring a smaller and cheaper weapons complex with no need for nuclear testing.

That said, the Committee remains to be convinced that a new warhead design will lead to

these benefits. The Committee will not spend the taxpayers' money for a new generation of warheads promoted as leading to nuclear reductions absent a specified glide path to a specified, much smaller force of nuclear weapons.

In its FY2009 report, the Senate Appropriations Committee recommended full funding for Life Extension Programs and Stockpile Systems, eliminating funds for RRW, increasing funds for Weapons Dismantlement by \$22.0 million, and reducing funds for Stockpile Services by \$43.6 million.

The Consolidated Security, Disaster Assistance, and Continuing Appropriations Act for FY2009, P.L. 110-329, provides no NNSA funds for RRW. Section 104 states, "No appropriation or funds made available or authority granted pursuant to section 101 shall be used to initiate or resume any project or activity for which appropriations, funds, or other authority were not available during fiscal year 2008." Section 101 appropriates

[s]uch amounts as may be necessary, at a rate for operations as provided in the applicable appropriations Acts for fiscal year 2008 and under the authority and conditions provided in such Acts, for continuing projects or activities (including the costs of direct loans and loan guarantees) that are not otherwise specifically provided for in this joint resolution, that were conducted in fiscal year 2008, and for which appropriations, funds, or other authority were made available in the following appropriations Acts: divisions A, B, C, D, F, G, H, J, and K of the Consolidated Appropriations Act, 2008 (P.L. 110-161).

In turn, Division C of P.L. 110-161, which provided appropriations for energy and water development, provided no NNSA funds for RRW. As noted, P.L. 111-8 provided no funds for RRW.

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 included 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 was \$287.6 million. For FY2009, the request was \$323.1 million. P.L. 111-8 provided \$318.7 million, including \$5.4 million for test readiness. The House Appropriations Committee “commends NNSA for its outstanding Stockpile Stewardship program, which has performed better than expected and has created a technically superior alternative to nuclear testing.” Further, “the Committee finds no evidence that nuclear testing would add a useful increment to the immense and expanding body of weapons knowledge arising from Stockpile Stewardship.” It called nuclear testing “a non-executable mission.” For these and other reasons, it recommended eliminating the \$10.4 million requested for nuclear test readiness. The Senate Appropriations Committee recommended \$331.1 million for this campaign, with an increase of \$8.0 million to support subcritical and other experiments. The committee expressed its support for the Advanced Certification program “to increase the confidence in changes to warhead design to increase the safety and reliability margins of the stockpile without underground testing”; these were goals of the RRW program. The committee recommended reducing nuclear test readiness to \$5.4 million.

- **Engineering Campaign.** This campaign develops capabilities to assess and improve nonnuclear components of nuclear warheads. It provides technologies to improve surety, which includes such nuclear weapon characteristics as safety, security, and use control; 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 this campaign was \$169.5 million. For FY2009, the request was \$142.7 million and P.L. 111-8 provided \$150.0 million. Within this campaign, the request for advanced surety was \$35.6 million; the committee provided \$70.0 million and barred use of the funds for RRW. The Senate Appropriations Committee recommended an increase of \$20.0 million. It stated that this campaign “offers the best opportunity to explore, develop and deploy state-of-the-art use control and surety devices to our stockpile.” These were also goals of the RRW program. The committee expressed its support for weapons surveillance sensors and encouraged NNSA to examine “broad applications beyond on-weapons controls” for these sensors.
- **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 in 2009,¹⁸ so the controversy over NIF has waned. The FY2008 budget for this campaign was \$470.2 million. The FY2009 request was \$421.2 million, which included no funds for NIF construction. P.L. 111-8 provided

¹⁸ Lawrence Livermore National Laboratory, “The National Ignition Facility: Ushering in a New Age for Science,” at <https://lasers.llnl.gov/programs/nif/>.

- \$436.9 million. The Senate Appropriations Committee recommended \$453.2 million, an increase of \$32.0 million, of which \$30.0 million was mainly for operation of NIF and another facility.
- **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 was \$574.5 million. The FY2009 request was \$561.7 million. P.L. 111-8 provided \$556.1 million. The report on the bill stated, “The budget submitted by NNSA has a striking lack of detail regarding the NNSA’s computing strategy ... This raises the concern that the acquisition strategy for new [computing] platforms will not fit within the available budget.” Accordingly, the report directed NNSA to provide a report on its computing strategy. The Senate Appropriations Committee recommended \$573.7 million, but stated that it “is frustrated by the lack of information regarding the computing strategy for the NNSA laboratories in this budget,” and accordingly requested NNSA to prepare a report on its shared computing strategy. The committee also expressed its concern “about the declining NNSA investment in computing platforms needed to sustain the computing capability at each of the three national security labs.”
 - **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 was \$158.1 million. The FY2009 request was \$183.0 million. P.L. 111-8 provided \$160.6 million. The Senate Appropriations Committee recommended a reduction of \$25.0 million, of which \$11.0 million was from tritium readiness activities “due to unobligated balances in this account.”

Readiness in Technical Base and Facilities (RTBF)

This program funds infrastructure and operations at nuclear weapons complex sites. The FY2008 budget was \$1,637.4 million. For FY2009, the request was \$1,720.5 million and P.L. 111-8 provided \$1,674.4 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." P.L. 111-8 provided \$97.2 million for CMRR. 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." In its FY2009 report, the House Appropriations Committee stated, regarding CMRR and the Radioactive Liquid Waste Treatment Facility, "In the absence of critical decisions on the nature and size of the stockpile, which in turn generate requirements for the nature and capacity of the nuclear weapons complex, it is impossible to determine the capacity required of either of these facilities. It would be imprudent to design and construct on the basis of a guess at their required capacity." Accordingly, the committee recommended no funds for either project. It also recommended no funds for two other projects, stating, "Each is a new start in the absence of a strategy defining the requirements for the facility."

The Senate Appropriations Committee recommended \$1,703.7 million for RTBF, a reduction of \$21.8 million. It recommended \$16.4 million (in two accounts) for the TA-55 Reinvestment Project. It recommended reducing funds for the Uranium Processing Facility at the Y-12 Plant by \$57.6 million, to \$38.6 million, on grounds of inadequate justification. It recommended \$125.0 million, an increase of \$24.8 million, for CMRR "to make up for [previous] funding shortfalls."

Other Programs

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

- 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 was \$158.7 million. The FY2009 request was \$221.9 million. The Senate Appropriations Committee recommended the same amount. P.L. 111-8 provided \$215.3 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 was \$180.0 million. The FY2009 request was \$169.5 million. The Senate Appropriations Committee recommended a reduction of \$6.0 million. P.L. 111-8 provided \$147.4 million.
- 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 was \$8.6 million. For FY2009, the request was \$40.6 million. The Senate Appropriations Committee recommended a reduction of \$12.3 million. P.L. 111-8 provided \$38.6 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 had no funds for FY2008. For FY2009, the request was \$77.4 million and the House Appropriations Committee recommended that amount. The committee provided this amount “notwithstanding that it is a new start in the absence of the required overall strategy, because it is a strategy-independent commendable step toward reducing the cost of operating the complex.” The Senate Appropriations Committee recommended eliminating the entire request. It “agrees with the goals of the new program,” but noted its frustration with DOE and the Office of Management and Budget (OMB) for funding this program while reducing by hundreds of millions of dollars decommissioning and demolition (D&D) of radiologically contaminated buildings under the control of DOE’s Office of Environmental Management. “On balance, the Committee does not see the logic in DOE and OMB’s priorities between these two programs D&D activities.” P.L. 111-8 provided no funds for this program.
- Safeguards and Security consists of three elements. (1) 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 was \$211.5 million. For FY2009, the request was \$221.1 million and the Senate Appropriations Committee recommended the same amount. P.L. 111-8 provided \$214.4 million. (2) Defense Nuclear Security provides operations, maintenance, and construction funds for protective forces, physical security systems, personnel security, and the like. The FY2008 budget is \$765.2 million (after deducting \$34.0 million for security work for others). For FY2009, the request was \$737.3 million. The Senate Appropriations Committee recommended the requested amount, and P.L. 111-8 provided \$735.2 million. (3) Cyber Security. For FY2008, the budget was \$100.3 million. The FY2009 request was \$122.5 million, and the Senate Appropriations Committee recommended that amount. P.L. 111-8 provided \$121.3 million.
- The Senate Appropriations Committee recommended \$3.5 million for congressionally directed projects. P.L. 111-8 provided \$22.8 million for that purpose.

The cost of Safeguards and Security is a major concern for Congress and NNSA. 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.”¹⁹ In response, many changes have been proposed to reduce 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.

¹⁹ Statement of Ambassador Linton F. Brooks, Administrator, National Nuclear Security Administration, before the Senate Armed Services Committee Subcommittee on Strategic Forces, April 4, 2005.

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).

Table 12. DOE Defense Nuclear Nonproliferation Programs
(\$ millions)

Program	FY2008	FY2009 Request	H.R. 7324 (110 th)	S. 3258 (110 th)	P.L. 111-8
Nonproliferation and Verification R&D	\$387.2	\$275.1	\$276.0	\$350.1	\$363.8
Nonproliferation and International Security ^a	150.0	140.5	165.3	175.5	150.0
International Materials Protection, Control and Accounting (MPC&A)	624.5	429.7	509.4	429.7	400.0
Elimination of Weapons-Grade Plutonium Production	179.9	141.3	141.3	141.3	141.3
Fissile Materials Disposition ^b	66.2	41.8	41.8	41.8	41.8
Global Threat Reduction Initiative	193.2	219.6	406.6	284.6	395.0
Cong. Dir. Projects	56.9	—	1.0	—	1.9
Rescissions and use of prior-year balances ^c	(322.0)	(0.1)	(11.4)	(0.1)	—
Total	1,336.0	1,247.0	1,530.0	1,422.0	1,482.4

Sources: H.Rept. 110-921; S.Rept. 110-416; H.R. 1105 Explanatory Statement.

Note: Numbers may not add due to rounding.

- Includes funding for two formerly separate programs: Russian Transition Initiatives and HEU Transparency Implementation.
- Funding for MOX plant was transferred to Nuclear Energy, and Pit Disassembly plant to NNSA. S. 3258 would return the MOX plant project to the Nonproliferation budget, adding \$487.1 million to Fissile Material Disposition and the total Defense Nuclear Nonproliferation program.
- From the Russian Fissile Materials Disposition program, MOX construction, and FY1999 emergency supplemental.

Funding for these programs in FY2008 was \$1.336 billion, compared with 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 House bill recommended \$1.530 billion. The Senate bill would appropriate \$1.422 billion, and would also return the Mixed Oxide plant project from Nuclear Power programs to Defense Nonproliferation, adding \$487 million for a total of \$1.909 billion.

The Nonproliferation and Verification R&D program was funded at \$387.2 million for FY2008. The request for FY2009 was \$275.1 million. The House bill recommended \$276.0 million. S. 3258 would have appropriated \$350.1 million. P.L. 111-8 would appropriate \$364 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 with \$150.0 million appropriated for FY2008. The House Appropriations Committee recommended \$165.3 million. The Committee “explicitly denied” funding under this program for Global Nuclear Energy Partnership (GNEP) activities. (See “Nuclear Power 2010” section, above.) The Senate bill would have appropriated \$175.5 million, but the Senate report did not mention GNEP. P.L. 111-8 appropriates \$150 million.

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 was \$429.7 million. The House bill recommended \$509.4 million; the Senate bill recommended the requested amount, \$429.7 million. P.L. 111-8 appropriates \$400 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 Bush Administration requested \$41.8 million. The House and Senate bill recommended the same amount, but the Senate bill would have returned the MOX plant to the Nonproliferation program. P.L. 111-8 appropriates \$41.8 million.

Cleanup of Former Nuclear Weapons Production Facilities and Nuclear Energy Research Facilities

The adequacy of funding to address human health and environmental risks resulting from the past production of nuclear weapons is a longstanding issue. In 1989, DOE established what is now the Office of Environmental Management to consolidate its efforts to administer the cleanup of former nuclear weapons sites. These “cleanup” efforts are expansive in scope, involving the disposal of substantial volumes of radioactive and other hazardous wastes, management and disposal of surplus nuclear materials, the remediation of soil and groundwater contamination, and the decontamination and decommissioning of excess buildings and facilities. Through this office, DOE also administers the disposal of wastes and remediation of contamination at sites where the federal government conducted civilian nuclear energy research.

Altogether, over 100 federal facilities²⁰ across the United States were involved in the production of nuclear weapons and nuclear energy research. The total land area of these facilities encompasses over 2 million acres, approximately the size of the states of Rhode Island and Delaware combined.²¹ Although cleanup is complete at over 80 of these facilities, DOE expects cleanup to continue at some facilities for many years, even decades at the larger and more complex facilities where substantial volumes of wastes are stored and contamination is more severe. DOE estimates that total outstanding costs to complete cleanup at all of the remaining facilities could range between \$205.43 billion and \$260.53 billion, and that the last facility, Hanford, in the state of Washington, may not be cleaned up until as late as 2062.²² DOE expects additional funds to be needed for long-term operation, maintenance, and monitoring activities at many facilities for additional decades after the initial cleanup work is completed to ensure protection of human health and the environment. All of these needs combined represent a substantial financial liability to the United States for many years into the future.

Some of the facilities historically administered under the Office of Environmental Management have been transferred to other offices within DOE and to the Army Corps of Engineers. In 1997, Congress directed the Office of Environmental Management to transfer responsibility for the cleanup of smaller, less contaminated facilities under the Formerly Utilized Sites Remedial Action Program (FUSRAP) to the Corps.²³ Once cleanup of a FUSRAP site is complete, the Corps is responsible for any long-term activities that may be needed only for the first two years after the initial cleanup work is completed. After that time, jurisdiction over the site is transferred to DOE's Office of Legacy Management to administer these activities. The Office of Legacy Management also administers any long-term activities that may be needed at facilities cleaned up under the Office of Environmental Management. FY2009 appropriations for each of these DOE offices and the FUSRAP program of the Corps are discussed below, including emergency supplemental appropriations provided in the American Recovery and Reinvestment Act of 2009 (P.L. 111-5, H.R. 1), as signed into law on February 17, 2009.

Office of Environmental Management

P.L. 111-8 provides a total of \$5.99 billion for the three accounts that fund DOE's Office of Environmental Management. These accounts include the Defense Environmental Cleanup account, the Non-Defense Environmental Cleanup account, and the Uranium Enrichment Decontamination and Decommissioning (D&D) Fund account. The \$5.99 billion in P.L. 111-8 is the total for these three accounts combined, after accounting for the offset for federal payment to the Uranium Enrichment D&D Fund from the Defense Environmental Cleanup account.²⁴ The

²⁰ The term "facility" in the context of cleanup refers not only to buildings and structures, but also to the land, including contamination in the soil, groundwater, and surface water, and contamination that migrates beyond a facility.

²¹ For a geographic listing of each facility, see DOE's Office of Environmental Management's website at [<http://www.em.doe.gov/Pages/SitesLocations.aspx?PAGEID=MAIN>].

²² DOE, Office of Environmental Management, Report to Congress: Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War, January 2009, p. 79.

²³ The Energy and Water Development Appropriations Act for FY1998 (P.L. 105-62) directed DOE to transfer certain smaller, less contaminated facilities to the Army Corps of Engineers because the Corps had experience in addressing similar contamination. Some also perceived that the cleanup of the larger, more contaminated facilities had diverted DOE's attention away from these smaller facilities.

²⁴ The federal payment is treated as an offset to the total funding for the Office of Environmental Management, because funds from the Defense Environmental Cleanup account contribute to the resources available for appropriation to the (continued...)

\$5.99 billion is a \$297 million increase above the \$5.70 billion that Congress enacted for FY2008. The Bush Administration had proposed \$5.53 billion for the Office of Environmental Management in its FY2009 budget request, submitted in February 2008.

P.L. 111-5 provided \$6.00 billion in FY2009 emergency supplemental appropriations for the Office of Environmental Management. This funding is in addition to the \$5.99 billion in regular (i.e., non-emergency) appropriations in P.L. 111-8, in effect more than doubling the funding that the Office has received in annual appropriations in recent years. The emergency supplemental funds are intended to stimulate the economy through the hiring of workers by private contractors that would carry out cleanup projects funded by DOE. (Contractors actually perform the work at cleanup sites with administration and oversight of the contracts by DOE personnel.)

DOE is responsible for allocating the \$6.00 billion in supplemental funds among individual projects, based on certain timing limitations and other conditions specified in P.L. 111-5. For example, the funding must be obligated by the end of FY2010 (September 30, 2010), to speed the availability of these monies for individual projects. In contrast, regular appropriations for the Office of Environmental Management typically remain available until expended. DOE could face an administrative challenge in obligating such a substantial sum in less than two years. The time limit also raises questions about how the competitiveness of contracts may be affected if contract awards must be made more quickly before the funding authority expires.

The adequacy of funding for the Office of Environmental Management to ensure compliance with cleanup “milestones” (i.e., deadlines) has been a prominent issue in the overall funding debate for FY2009. In presenting its FY2009 budget request in the 110th Congress, the Bush Administration had acknowledged a \$900 million shortfall for the Office of Environmental Management that could have resulted in missed milestones.²⁵ Cleanup milestones can be critical in gauging efforts to address potential risks at individual facilities, as these milestones establish time frames for the completion of specific actions or steps within the cleanup process.

Cleanup milestones are identified in written agreements among DOE, the Environmental Protection Agency (EPA), and state regulatory agencies. Although cleanup 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, it should be noted that the availability of funds is not the sole factor that determines whether DOE can meet a cleanup deadline.

Of the facilities still in need of cleanup, Hanford, noted above, is the largest and most complex facility administered under the Office of Environmental Management. This facility alone receives about one-third of the funding for the entire Office. P.L. 111-8 provides a total of \$1.98 billion for Hanford in FY2009, including the Office of River Protection at Hanford that administers the cleanup of contamination and disposal of wastes along the Columbia River. The House amount is an increase above the Bush request of \$1.83 billion, and the \$1.86 billion enacted for FY2008.

(...continued)

Uranium Enrichment D&D Fund account. In effect, the payment functions similar to a transfer of funds within the Office’s accounts, rather than adding to the Office’s overall available funding to support cleanup efforts.

²⁵ 110th Congress, Senate Committee on Appropriations, Energy and Water Development Appropriations Bill, 2009, S. 3258, S.Rept. 110-416, p. 130.

The adequacy of funding for Hanford has been particularly controversial for many reasons, including potential risks from radionuclides migrating through groundwater into the Columbia River. Related to this issue is the delayed construction of the Waste Treatment and Immobilization Plant. This plant 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 facing DOE. Some of the tanks at Hanford are known or suspected to have leaked wastes that have migrated through groundwater that eventually discharges into the Columbia River. Similar high-level radioactive wastes also are in need of treatment and disposal at the Idaho National Laboratory and at the Savannah River facility in South Carolina, but the volume of these wastes is not as great as those at Hanford.²⁶

The vast majority of the FY2009 emergency supplemental funds for the Office of Environmental Management were for defense facilities, such as Hanford. Considering the funding needs, DOE could allocate a relatively large portion of those funds to defense cleanup projects at Hanford, increasing the total amount available for FY2009 beyond the omnibus amount for the facility.

Table 13 presents appropriations for the Office of Environmental Management enacted for FY2008, compared with President Bush's FY2009 budget request, FY2009 emergency supplemental appropriations enacted in P.L. 111-5, and FY2009 omnibus appropriations in P.L. 111-8. The table presents these respective amounts for the three statutory accounts that fund the Office of Environmental Management.

A breakout of funds is provided for selected facilities and activities in which there has been broad congressional interest, with the exception of the emergency supplemental appropriations enacted in P.L. 111-5. These supplemental funds were not broken out by individual facilities and activities within the three statutory accounts. As noted above, DOE is responsible for allocating the emergency supplemental funds within each account, based on certain timing limitations and other conditions specified in P.L. 111-5.

Table 13. Appropriations for the Office of Environmental Management
(\$ millions)

Accounts	FY2008 Enacted	Bush Request	FY2009	
			"Stimulus" P.L. 111-5 H.R. 1	Omnibus P.L. 111-8
Defense Environmental Cleanup				
Accelerated Closure Sites	\$42.1	\$45.9	—	\$45.9
Hanford				
2012 and 2035 Completions	\$886.5	\$851.8	—	\$967.0

²⁶ According to DOE's most recent estimate, there are a total of 54 million gallons of radioactive waste stored in 177 tanks at Hanford, 33 million gallons in 49 tanks at Savannah River, and nearly 1 million gallons in 4 tanks at the Idaho National Laboratory. See DOE, Office of Environmental Management, Report to Congress: Status of Environmental Management Initiatives to Accelerate the Reduction of Environmental Risks and Challenges Posed by the Legacy of the Cold War, January 2009, pp. 23-24.

Accounts	FY2008 Enacted	Bush Request	FY2009	
			"Stimulus" P.L. 111-5 H.R. 1	Omnibus P.L. 111-8
<i>Office of River Protection</i>	\$969.5	\$978.4	—	\$1,009.9
Hanford Total	\$1,856.0	\$1,830.2	—	\$1,976.9
Savannah River Site	\$1,131.2	\$1,206.4	—	\$1,227.1
Idaho National Laboratory	\$508.4	\$432.1	—	\$475.8
Oak Ridge Reservation	\$190.5	\$237.7	—	\$262.8
Waste Isolation Pilot Plant	\$234.6	\$211.5	—	\$231.7
NNSA Sites	\$290.3	\$245.1	—	\$320.9
Technology Development	\$21.2	\$32.4	—	\$32.3
Safeguards and Security	\$259.3	\$251.3	—	\$260.3
Program Direction	\$306.9	\$308.8	—	\$309.8
Program Support	\$32.8	\$33.9	—	\$33.9
Federal Contribution to Uranium Enrichment D&D Fund ^a	\$458.8	\$463.0	—	\$463.0
Congressionally Directed Projects	\$17.2	\$0.0	\$0.0	\$17.9
Use of Prior Year Funds	\$0.0	-\$1.1	\$0.0	-\$1.1
Subtotal Defense Environmental Cleanup	\$5,349.3	\$5,297.3	\$5,127.0	\$5,657.3
Non-Defense Environmental Cleanup				
Facility Accounts	\$182.3	\$214.1	\$390.0	\$257.7
Congressionally Directed Projects	\$0.0	\$0.0	\$0.0	\$4.8
Use of Prior Year Funds	\$0.0	-\$0.7	\$0.0	-\$0.7
Subtotal Non-Defense Environmental Cleanup	\$182.3	\$213.4	\$390.0	\$261.8
Uranium Enrichment D&D Fund^a	\$622.2	\$480.3	\$483.0	\$535.5
Uranium Enrichment D&D Fund Offset^a	-\$458.8	-\$463.0	\$0.0	-\$463.0
Total Office of Environmental Management	\$5,695.0	\$5,528.0	\$6,000.0	\$5,991.6

Source: Prepared by the Congressional Research Service using information from the conference report on the American Recovery and Reinvestment Act of 2009 (H.R. 1, H.Rept. 111-16), and the explanatory statement to the Omnibus Appropriations Act for FY2009 (H.R. 1105), as presented in the Congressional Record, February 23, 2009, p. H1975, and p. H1982-H1983. FY2008 enacted amounts reflect rescissions.

- 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 Office of Environmental Management.

Formerly Utilized Sites Remedial Action Program

The FUSRAP program addresses the cleanup of sites contaminated with low-level radiation that resulted from the processing and storage of uranium and thorium ores during the early years of the U.S. nuclear weapons program. Private companies owned and operated the majority of these facilities from the 1940s to the 1960s under contract with DOE's predecessors, the Atomic Energy Commission and the Manhattan Engineer District. The Atomic Energy Commission originally established FUSRAP in 1974 under authorities provided in the Atomic Energy Act. DOE later incorporated FUSRAP into the Office of Environmental Management when that Office was established in 1989. As discussed earlier, Congress directed DOE to transfer FUSRAP to the Army Corps of Engineers in 1997 to clean up the remaining facilities, and then to transfer the facilities back to DOE's Office of Legacy Management for any long-term activities that may be needed to ensure the effectiveness of cleanup actions into the future.

Congress currently appropriates funding for FUSRAP under a dedicated account within the civil works accounts of the Corps. P.L. 111-8 provides \$140 million for FUSRAP for FY2009, the same as enacted for FY2008 prior to rescissions. The Bush Administration had requested \$130 million for FY2009.

P.L. 111-5 provided \$100 million in FY2009 emergency supplemental appropriations for FUSRAP. These funds are in addition to the \$140 million in regular appropriations in P.L. 111-8, substantially increasing the funding typically appropriated in a single fiscal year. Similar to the supplemental funds for DOE's Office of Environmental Management also provided in P.L. 111-5, the \$100 million for FUSRAP is intended to help stimulate the economy through the hiring of workers to carry out cleanup projects funded by the Corps. As with DOE, the Corps is responsible for allocating these supplemental funds among individual projects, based on certain timing limitations and other conditions specified in P.L. 111-5. In addition to obligating the funds by the end of FY2010, the Corps is restricted to using the funds only for projects that can be completed with the \$100 million and would not require additional budget authority to complete. The Corps also is required to submit quarterly reports to the House and Senate Appropriations Committees within 45 days of enactment, indicating the allocation, obligation, and expenditure of the funds. The \$6.00 billion in supplemental funds for the Office of Environmental Management does not appear to be subject to these reporting requirements.

Table 14 compares the FY2008 enacted appropriations for the FUSRAP program to President Bush's FY2009 budget request, FY2009 emergency supplemental appropriations enacted in P.L. 111-5, and FY2009 omnibus appropriations in P.L. 111-8.

Table 14. Formerly Utilized Sites Remedial Action Program

(\$ millions)

Account	FY2008 Enacted	FY2009		
		Bush Request	"Stimulus" P.L. 111-5 H.R. 1	Omnibus P.L. 111-8
Formerly Utilized Sites Remedial Action Program	\$140.0	\$130.0	\$100.0	\$140.0

Source: Prepared by the Congressional Research Service using information from the conference report on the American Recovery and Reinvestment Act of 2009 (H.R. 1, H.Rept. 111-16), and the explanatory statement to the Omnibus Appropriations Act for FY2009 (H.R. 1105), as presented in the Congressional Record, February 23, 2009, p. H2048. FY2008 enacted amount does not reflect rescissions, as the explanatory statement accompanying H.R. 1105 did not report the rescinded amounts for the Corps by individual account.

Office of Legacy Management

As explained earlier, once a facility is cleaned up under DOE's Office of Environmental Management²⁷ or the FUSRAP program of the Corps, responsibility for any necessary long-term operation, maintenance, and monitoring activities is transferred to DOE's Office of Legacy Management. This Office also manages the payment of pensions and post-retirement benefits of former contractor personnel who worked at these sites.²⁸ As indicated in **Table 15**, P.L. 111-8 provides \$186.0 million for the Office of Legacy Management in FY2009, the same as President Bush had requested, but \$2.9 million less than the \$188.9 million enacted for FY2008. No emergency supplemental appropriations were provided for the Office of Legacy Management in P.L. 111-5.

In FY2009, all facilities administered under the Office of Legacy Management are to be funded under the "Other Defense Activities" account of DOE. The majority of these facilities were involved in the U.S. nuclear weapons program. Prior to FY2009, Congress had appropriated funding in a separate account for the relatively small number of non-defense facilities administered under the Office of Legacy Management. Funding for both types of facilities are combined into one account for FY2009. Although the appropriations for FY2009 are a slight decrease from the amount enacted for FY2008, the funding needs for the Office of Legacy Management are likely to grow significantly in future years, as more sites are transferred from the Office of Environmental Management and the FUSRAP program to perform long-term operation, maintenance, and monitoring activities after the initial cleanup work is completed.

Table 15. Office of Legacy Management Appropriations
(\$ millions)

Account	FY2008 Enacted	FY2009	
		Request	Omnibus P.L. 111-8
Defense	\$155.0	\$186.0	\$186.0
Non-defense ^a	\$33.9	\$0.0	\$0.0
Total	\$188.9	\$186.0	\$186.0

Source: Prepared by the Congressional Research Service using information from the explanatory statement to the Omnibus Appropriations Act for FY2009 (H.R. 1105), as presented in the Congressional Record, February 23, 2009, p. H1974 and H1984. FY2008 enacted amounts reflect rescissions.

²⁷ Some facilities administered under the Office of Environmental Management will have a continuing DOE mission after cleanup is complete. Those facilities will be transferred to the DOE offices that will administer those missions. These active mission offices will be responsible for any long-term activities associated with the cleanup, rather than the Office of Legacy Management.

²⁸ Similar to long-term activities associated with cleanup, the payment of pensions and post-retirement benefits of workers at facilities with a continuing DOE mission is assigned to the program office within DOE that is responsible for administering that mission, rather than the Office of Legacy Management.

- a. In FY2009, all facilities administered under the Office of Legacy Management would be funded under the “Other Defense Activities” account, including non-defense facilities.

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 to sell the power generated by the dams 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. (For more information, see CRS Report RS22564, *Power Marketing Administrations: Background and Current Issues*, by (name redacted).)

Priority for PMA power is extended to “preference customers,” which include municipal utilities, cooperatives, 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 Bush Administration’s FY2009 request for the PMAs was \$232.1 million. This is an overall reduction of \$8.3 million (3.5%) 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. In addition, \$3.0 million was requested for Falcon and Amistad operations and maintenance.

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.

BPA is a self-funded agency under authority granted by P.L. 93-454 (16 U.S.C. §838), the Federal Columbia River Transmission System Act of 1974, and receives no appropriations. However, 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 offset by \$259 million in bond repayment) in FY2009. Any third-party funding agreements for capital projects may further restrict the agency’s use of borrowing authority.

BPA 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 it hoped the Administration would not pursue a similar proposal in FY2009.²⁹

The House Committee on Appropriations recommended funds at the requested level for FY2009 for each of the PMAs. Additionally, the Committee recommended no new borrowing authority for BPA in FY2009. The Senate Committee on Appropriations also recommended meeting the

²⁹ *Joint Explanatory Statement to Accompany Consolidated Appropriations Amendment*, p. 56. See <http://www.rules.house.gov/110/text/omni/jes/jesdivc.pdf>.

funding request for SEPA and SWPA, and concurred with the House regarding any additional BPA borrowing authority. However, the Senate panel recommended \$218.3 million for WAPA, an increase of \$25 million over the President's request and the House recommendation.

The Senate Committee on Appropriations expressed concern that the President's request for WAPA relied too heavily on alternative financing methods—such as direct customer financing—for its Construction, Rehabilitation, Operations and Maintenance budget, which the Committee indicated may reduce WAPA transmission system reliability. The Committee also noted that drought and increased power prices may contribute to an increase in WAPA's funding requirements for Purchase Power and Wheeling.

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 16. Energy and Water Development Appropriations
Title IV: Independent Agencies**
(\$ millions)

Program	FY2008	FY2009 Request	House	Senate	P.L. 111-8
Appalachian Regional Commission	\$73.0	\$65.0	\$65.0	\$85.0	75.0
Nuclear Regulatory Commission	926.1	1,017.0	1,069.8	1,032.3	1,045.6
(Revenues)	(779.1)	(855.5)	(870.6)	(869.3)	(870.7)
Net NRC (including Insp. Gen.)	147.0	161.5	199.2	163.1	174.9
Defense Nuclear Facilities Safety Board	21.9	25.5	25.5	25.5	25.0
Nuclear Waste Technical Review Board	3.6	3.8	3.8	3.8	3.8
Denali Commission	21.8	1.8	1.8	21.8	11.8
Fed. Coordinator, Alaska Gas Projects	2.3	4.4	4.4	4.4	4.4
Delta Regional Authority	11.7	6.0	6.0	20.0	13.0
Total	281.3	268.0	305.7	323.5	307.9

Source: FY2009 Budget Request; House Appropriations Committee draft report.

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 House Appropriations Committee recommended boosting NRC's total funding to \$1.070

billion, while the Senate panel recommended \$1.032 billion. P.L. 111-8 provides a total funding level of \$1.046 billion, including \$10.0 million for the inspector general.

The NRC budget request included \$237.5 million for new reactor activities, largely to handle anticipated new nuclear power plant license applications. Until recently, 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 21 reactor license applications will be submitted through the end of 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; the application was submitted June 3, 2008. The House panel boosted funding for NRC's review of the Yucca Mountain application to \$73.3 million, and added \$15.0 million for scholarships and \$1.8 million for the NRC inspector general. The Senate Appropriations Committee added \$15 million to the NRC request for a new Integrated University Program to be coordinated with DOE. P.L. 111-8 provides \$49.0 million for Yucca Mountain licensing.

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 (name redacted) and (name redacted).)

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 general homeland security, and DOE defense waste oversight. The offsets in the FY2009 request would have resulted in a net appropriation of \$161.5 million. The House Appropriations Committee had recommended a net appropriation of \$199.2 million, and the Senate panel would have provided a net level of \$163.1 million. Net appropriations for NRC in P.L. 111-8 total \$174.9 million, including the inspector general's office.

For Additional Reading

CRS Products

CRS Report RL31975, *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by (name redacted) and (name redacted).

CRS Report RL33504, *Water Resources Development Act (WRDA) of 2007: Corps of Engineers Project Authorization Issues*, coordinated by (name redacted).

CRS Report RL32064, *Army Corps of Engineers Water Resources Projects: Authorization and Appropriations*, by (name redacted) and (name redacted),

CRS Report RS20866, *The Civil Works Program of the Army Corps of Engineers: A Primer*, by (name redacted) and (name redacted).

CRS Report RS21331, *Everglades Restoration: Modified Water Deliveries Project*, by (name redacted).

CRS Report RL31098, *Klamath River Basin Issues: An Overview of Water Use Conflicts*, by (name redacted), (name redacted), and (name redacted).

CRS Report RL32131, *Phosphorus Mitigation in the Everglades*, by (name redacted) and (name redacted).

CRS Report RS21442, *Hydrogen and Fuel Cell Vehicle R&D: FreedomCAR and the President's Hydrogen Fuel Initiative*, by (name redacted).

CRS Report RL33558, *Nuclear Energy Policy*, by (name redacted).

CRS Report RL34331, *Nuclear Power Plant Security and Vulnerabilities*, by (name redacted) and (name redacted).

CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by (name redacted).

CRS Report RL32163, *Radioactive Waste Streams: Waste Classification for Disposal*, by (name redacted).

CRS Report RL34579, *Advanced Nuclear Power and Fuel Cycle Technologies: Outlook and Policy Options*, by (name redacted).

CRS Report R40202, *Nuclear Waste Disposal: Alternatives to Yucca Mountain*, by (name redacted).

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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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