Energy and Water Development: FY2010 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, the Department of Energy (DOE), and a number of independent agencies.

Key budgetary issues for FY2010 involving these programs may include:

- 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) and San Joaquin River (Title II);
- funding for the proposed national nuclear waste repository at Yucca Mountain, Nevada (Title III: Nuclear Waste Disposal);
- several new initiatives proposed for Energy Efficiency and Renewable Energy (EERE) programs (Title III); and
- funding decisions in DOE's Office of Environmental Management.

Energy and Water Development funding for FY2009 was included in the Omnibus Appropriations Act, 2009 (P.L. 111-8). In addition, the American Recovery and Reinvestment Act (ARRA, the "Stimulus" Act, P.L. 111-5) included funding for numerous programs in the Corps of Engineers, the Bureau of Reclamation, and the Department of Energy, to be expended in FY2009 and FY2010.

Funding for FY2010 Energy and Water Development programs is contained in H.R. 3183, which the House passed July 17, 2009. The Senate passed its version of H.R. 3183 July 29. The Conference Committee issued its report (H.Rept. 111-278) September 30, and the House passed the conference bill October 1, and the Senate October 15. The President signed the bill October 28 (P.L. 111-85).

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Energy and Water Development funding for FY2009 was included in the Omnibus Appropriations Act, 2009 (P.L. 111-8). Appropriations for these programs in P.L. 111-8 totaled $40.549 billion, including $7.5 billion for Advanced Technical Vehicles Manufacturing Loans in the Department of Energy. In addition, the American Recovery and Reinvestment Act (the "Stimulus" Act, P.L. 111-5) included $44.325 billion to fund numerous programs in the Corps of Engineers, the Bureau of Reclamation, and the Department of Energy, to be expended in FY2009 and FY2010.

President Obama's proposed FY2010 budget for Energy and Water Development programs was released in May 2009.

The House Appropriations subcommittee on energy and water development marked up the FY2010 bill on June 25, 2009, and the full committee voted to report the bill (H.R. 3183, H.Rept. 111-203) on July 8. The House passed the bill, including several amendments, July 17.

The Senate subcommittee marked up its bill July 8, and the full Senate Appropriations Committee reported the bill (S. 1436, S.Rept. 111-45) on July 9. The Senate passed its version of H.R. 3183, incorporating the provisions of S. 1436, with amendments, on July 29.

The Conference Committee reported out H.R. 3183 on September 30 (H.Rept. 111-278) and the House passed it October 1 and the Senate October 15. It was signed by the President October 28 (P.L. 111-85).

Status

Table 1. Status of Energy and Water Development Appropriations, FY2010

Subcommittee Markup							Final Approval		
House	Senate	House Report	House Passage	Senate Report	Senate Passage	Conf. Report	House	Senate	Public Law
6/25/09	7/8/09	111-203	7/17/09	111-45	7/29/09	111-278	10/1/09	10/15/09	10/28/09

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, 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, FY2003 to FY2010

(budget authority in billions of current dollars)

FY2003	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010[a]
26.1	26.7	30.2[b]	36.7[c]	29.4	30.9	40.5[d]	33.1

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

a. Requested budget authority.

b. 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.

c. Includes $6.6 billion in emergency funding for the Corps of Engineers.

d. Includes $7.5 billion for Vehicles Manufacturers Loans.

Table 3 lists totals for each of the bill's four titles. It also lists the total of several scorekeeping adjustments.

Table 3. Energy and Water Development Appropriations Summary

($ millions)

Title	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Title I: Corps of Engineers	$5,402.4	$4,600.0	$5,125.0	$5,540.1	$5,405.0	$5,445.0
Title II: CUP & Reclamation	1,115.8	1,000.0	1,062.7	1,080.0	1,172.7	1,129.7
Title III: Department of Energy	34,239.0[a]	38,725.0	28,383.8	26,855.8	27,375.2	27,088.4
Title IV: Independent Agencies	302.4	—	319.3	314.8	295.1	291.8
E&W Subtotal	**41,059.5**	**44,325.0**	**34,890.8**	**33,790.7**	**34,248.0**	**33,954.9**
Scorekeeping Adjustments						
Title II						
Central Valley	-52.7	—	-35.1	-35.1	-35.1	-35.1
Title III						
Uranium D&D Fund	-463.0	—	-463.0	-463.0	-463.0	-463.0
Domestic Utility Fees[b]	—	—	-200.0	—	—	—
Excess FERC Fees	-27.7	—	-27.1	-27.1	-27.1	-27.1
E&W Total	**40,516.0**	**44,325.0**	**34,165.6**	**33,265.6**	**33,722.9**	**33,429.8**

Sources: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45, H.Rept. 111-278.

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

a. Includes $7.5 billion for Vehicles Manufacturers Loans appropriated in P.L. 110-329.

b. The President's FY2010 budget proposed to reauthorize the collection of domestic utility fees on nuclear power utilities that expired in 2007. The fees contribute to the Uranium Enrichment D&D Fund.

Tables 4 through **14** 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 FY2009-FY2010. 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

Recent Agency Appropriations

Annual Appropriations

In most years, the budget request for the Army Corps of Engineers is below the agency's final appropriations. The conference report would appropriate $5.445 billion, which is $0.320 billion above the Obama Administration's budget request of $5.125 billion and $0.043 billion above the $5.402 billion appropriated for FY2009. The House bill would have appropriated $5.540 billion; the Senate bill would have appropriated $5.405 billion.

Supplemental Appropriations

Regular annual appropriations for the Corps' civil works activities have been regularly augmented since Hurricane Katrina, through supplemental appropriations and through the American Recovery and Reinvestment Act of 2009. For example, in the Supplemental Appropriations Act of 2008 (P.L. 110-252), the agency received $5.761 billion in FY2009 funds for Louisiana hurricane protection. The American Recovery and Reinvestment Act of 2009 provided an additional $4.6 billion to the agency for FY2009 and FY2010. The Supplemental Appropriations Act of 2009, P.L. 111-32, provided the Corps $0.797 billion in supplemental FY2009 appropriations.

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

($ millions)

Program	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Investigations and Planning	$168.1	$25.0	$100.0	$142.0	$170.0	$160.0
Construction	2,141.7	2,000.0	1,718.0	2,143.7	1,924.0	2031.0
Mississippi River & Tributaries	383.8	375.0	248.0	251.4	340.0	340.0
Operation and Maintenance (O&M)	2201.9	2,075.0	2,504.0	2,511.0	2,450.0	2,400.0
Regulatory	183.0	25.0	190.0	191.8	190.0	190.0
General Expenses	179.4		184.0	160.2	186.0	185.0
FUSRAP[a]	140.0	100.0	134.0	134.0	140.0	134.0
Flood Control & Coastal Emergencies (FC&CE)	0	0	41.0	0	0	0
Office of the Asst. Secretary of the Army	4.5	0	6.0	6.0	5.0	5.0
Total Title I	**5,402.4**[b]	**4,600.0**	**5,125.0**	**5,540.1**	**5,405.0**	**5,445.0**

Sources: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45; H.Rept. 111-278.

Note: The table does not include the supplemental appropriations. The Supplemental Appropriations Act of 2008 (P.L. 110-252) provided the Corps $5.761 billion in FY2009 for Louisiana hurricane protection.

a. Formerly Utilized Sites Remedial Action Program, a program to investigate and clean up or control sites that were part of the early atomic energy and weapons program.

b. The Supplemental Appropriations Act of 2009, P.L. 111-32, provided the Corps $0.797 billion in supplemental FY2009 appropriations.

An Agency Budget Composed Mainly of Projects

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 about 85% of the appropriations for the Corps' civil works activities is directed to 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 processes, and how to prioritize among authorized activities.

New Starts

The Obama Administration's request for the Corps includes new starts (i.e., activities not previously funded). For example, the request includes five new, but previously authorized, construction projects. This contrasts with the George W. Bush Administration's policy generally opposing new starts in order to focus funds on completing ongoing activities. Congress funded new starts during the G.W. Bush years. The House bill supports the Obama Administration's request on new starts and adds 20 new projects not requested by the Administration. The Senate Appropriations Committee concluded in its report (S.Rept. 111-45, p. 15) that new starts in the current budget environment would be imprudent. It is unclear how many new starts are in the H.Rept. 111-278.

Key Policy Issues—Corps of Engineers

Inland Waterway Trust Fund

The Inland Waterway Trust Fund (IWTF) has a looming deficit; needed funding for eligible ongoing work has exceeded the incoming collections. Collections have been roughly $100 million per year, but the outlays more than $200 million. Current law establishes the expenses associated with construction and major rehabilitation of inland waterways as 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 (not indexed for inflation) imposed on vessels engaged in commercial transportation on designated waterways, plus investment interest on the balance.

The Obama Administration's budget request included a legislative proposal to authorize a lock usage fee to replace the current fuel tax, which previously had been proposed by the Bush Administration. This proposal is included in neither the House nor the Senate bill. The House identified addressing the insolvency of the IWTF as the most immediate navigation need, but did not include legislative language to address the need. The Senate Committee report discussed alternatives to the Administration's proposal, but it did not propose legislative changes. Instead, S.Rept. 111-45 stated: "A solution to this problem must be developed with the users of the system, the Corps and the appropriate authorizing committees of the Congress." The conference report directed the Administration to report by April 2010 on the status of the fund and to identify a list of priority projects with supporting information. Like the House bill and the Senate bill, the conference bill would prohibit funds in the bill to be used for awarding any new continuing contracts that commit additional IWTF funds until the insolvency issue has been resolved.[1]

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 are also 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 FY2010 Obama Administration request for the Corps' south Florida Everglades restoration work totals $214.5 million. The conference bill provides $180 million for Everglades restoration. The House bill would have appropriated $210.2 million for Everglades restoration; the Senate bill would have provided $163.4 million. None of the bills would appropriate funds to the Modified Water Deliveries Project, with the direction for the project to be funded through the Department of Interior.

Post-Katrina Gulf Coast Hurricane Protection

The Corps is responsible for much of the repair and fortification of the hurricane protection system of coastal Louisiana, particularly in the New Orleans area. To date, most of the Corps' work on the region's hurricane protection system has been funded through $15 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. The Supplemental Appropriations Act of 2009, P.L. 111-32, provided the Corps $0.439

[1] In FY2009, some inland waterway projects were paid for using IWTF funds, while others were paid for using general revenue funds until they could be brought to a logical stopping point. Future work on these projects is deferred until IWTF collections are 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, with outlays significantly below collections. Navigation stakeholders argue that this balance poses the opposite equity concern.

billion in supplemental FY2009 appropriations for barrier island restoration and ecosystem restoration for the Mississippi Gulf Coast.

Title II: Department of the Interior

Central Utah Project and Bureau of Reclamation: Budget in Brief

The Obama Administration requested $42.0 million for the Central Utah Project (CUP) Completion Account, the same amount as appropriated for FY2009. The FY2010 request for the Bureau of Reclamation totals $1,020.7 million in gross current budget authority. This amount is $55.1 million less than enacted for FY2009. The FY2010 request included an "offset" of $35.1 million for the Central Valley Project (CVP) Restoration Fund (Congress does not list this line item as an offset), yielding a "net" discretionary authority of $985.7 million. Another $117.3 million is estimated to be available for FY2010 via "permanent and other" funds, for a grand total of $1.1 billion for FY2010. The total discretionary budget request (not including the CVPRF offset) for Title II funding—Central Utah Project and Reclamation—is $1.06 billion. The House-passed bill includes approximately $1.08 billion for Title II funding; the Senate bill would appropriate $1.17 billion. The conference report includes approximately $1.13 billion, slightly more than enacted under the regular appropriations bill for FY2009.

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

($ millions)

Program	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Central Utah Water Conservancy District	$39.4	$41.0	$37.7	$37.7	$38.8	$38.8
Mitigation and Conservation Commission Activities	1.0	8.7	1.5	1.5	1.5	1.5
DOI Oversight and Administration	1.6	—	1.7	1.7	1.7	1.7
DOI Fish and Wildlife Conservation Projects	—	0.3	1.1[a]	1.1		
Total, Central Utah Project	**42.0**	**50.0**	**42.0**	**42.0**	**42.0**	**42.0**

Sources: FY2010 Budget Request. *Department of the Interior Budget Justifications and Performance Information Fiscal Year 2010, Central Utah Project Completion Act;* H.Rept. 111-203, S.Rept. 111-45, H.Rept. 111-278.

a. Funds reported within the CUP completion account (Central Utah Water Conservancy District total) for FY2009.

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

($ millions)

Program	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf
Water and Related Resources	$920.3	$950.0	$893.1	$910.3	$993.1	$951.2
Policy and Administration	59.4	—	61.2	51.2	61.2	61.2
CVP Restoration Fund (CVPRF)	56.1	—	35.4	35.4	35.4	35.4
Calif. Bay-Delta (CALFED)	40.0	—	31.0	41.0	41.0	40.0
Gross Current Reclamation Authority	**1,075.8**	**950.0**	**1,020.7**	**1,037.8**	**1,130.7**	**1,087.0**
Total, Title II (CUP and Reclamation)	**1,115.8**	**1,000.0**	**1,062.7**	**1,079.8**	**1,172.7**	**1,129.7**

Source: FY2010 Budget Request, *Department of the Interior Budget Justifications and Performance Information Fiscal Year 2010, Bureau of Reclamation*; H.Rept. 111-203, House floor proceedings, and S.Rept. 111-45, H.Rept. 111-278.

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 Obama Administration requested $893.1 million for the Water and Related Resources Account for FY2010. This amount is $27.1 million (approximately 3%) less than enacted for FY2009. The House bill includes $910.3 million for the Water and Related Resources Account—roughly $17 million more than requested; the Senate bill would appropriate $993.1 million—$100 million more than requested. The conference agreement includes $951.2 million for the account, roughly $31.0 million more than enacted in the FY2009 regular appropriations bill and approximately $58 million more than requested for FY2010.

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 a population of 31 million. 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.

As with the Corps of Engineers, the Reclamation budget is made up largely of individual project funding and relatively few "programs." The House Committee on Appropriations noted that despite Reclamation's past achievements, the agency has become a "caretaker agency" and has

not exerted leadership in the provision of water supply or maintaining the West's existing water supply infrastructure. The House Appropriations Committee notes that the combined challenges of balancing competing needs, increasing demand for water supply, and changing hydrology will require active leadership in western water resource management.

Central Valley Project (CVP) Operations

The CVP in California is one of Reclamation's largest and most complex water projects. Recently, Reclamation has had to limit water deliveries and pumping from CVP facilities due to drought and other factors, including environmental restrictions. This action has resulted in several amendments including attempts to prevent Reclamation from implementing new Biological Opinions (BiOps) on the effect of project operations on certain fish species. For example, Representative Calvert offered an amendment to prohibit Reclamation or any state agency from restricting operations of the CVP or State Water Project (SWP) due to recent BiOps on project operations. The two BiOps in question have found that continued operation of the projects under a plan developed and implemented in 2004 (Operations Criteria and Plan (OCAP)) would jeopardize the existence of both Delta Smelt and salmon (and other) species in California. These species are protected under the federal Endangered Species Act (ESA) and the California Endangered Species Act. OCAP allowed increased pumping from the Delta, which some believe has further imperiled fish species listed as threatened or endangered under ESA long before the increased pumping plan went into effect. Others note that other factors such as invasive species, pollution, and non-federal withdrawals of water from the Delta have contributed to fishery declines. Critically low numbers of Delta Smelt resulted in a court-imposed limit on pumping at certain times and more recently, a new review of project operations and impacts on the economy and species. In the meantime, low water deliveries to certain water districts (e.g., those with junior water rights) are exacerbating unemployment in an area with an economy already challenged by changes in the farming industry, the downturn in housing and financial sectors, and the economy in general.

The Calvert amendment was defeated by a vote of 25 to 33. Similar amendments were proposed for several other appropriations bills, in the House. And a similar amendment via a motion to recommit the annual Interior, Environment, and Related Agencies appropriations bill in the Senate was not successful.[2] However, two other amendments related to Delta pumping restrictions passed during House consideration of the bill: one providing an additional $10 million for the California Bay-Delta Restoration Program (changed to $9 million in conference), and another including language to facilitate water transfers. The latter amendment was subsequently modified and appears as Section 211 of the conference agreement, providing for a two-year authorization of water transfers among certain CVP contractors without meeting particular conditions established by the Central Valley Project Improvement Act (Title 34 of P.L. 102-575).

CALFED and the Central Valley Project Restoration Fund (CVPRF)

The Administration requested $31.0 million for the California Bay-Delta Restoration Account (Bay-Delta, or CALFED) for FY2010. This request is $9.0 million less than the $40.0 million enacted for FY2009. The bulk of the requested funds is targeted at five program areas: (1) water

[2] For more information on this procedure and the amendment's potential effects, see, CRS Report R40776, *Fish and Wildlife Service: Appropriations and Policy* , by (name redacted).

use efficiency ($5.0 million); (2) water quality ($5.0 million); (3) water storage ($4.05 million); (4) conveyance ($4.1 million); and ecosystem restoration ($7.85 million). The remainder of the request is allocated for science, planning, and management activities. In a departure from previous years, the Administration requested no funding for the "Environmental Water Account" and instead applied $5.0 million of the FY2010 CALFED request to "water use efficiency," $3.0 million of which is for the Bay Area Regional Water Recycling Program. In prior years, such recycling programs and projects (Title XVI projects) have been included in the Water and Related Resources Account. Funding for three CALFED subaccounts declined substantially (storage, conveyance, and EWA), while funding for water use efficiency and ecosystem restoration increased substantially. (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).)

The conference agreement provides $40 million for CALFED, which is $9 million more than requested, but $1 million less than recommended in the House and Senate bills. The conference agreement provides $35.4 million for the CVPRF; the same amount as requested for FY2010. The conference agreement also includes a provision (Section 210) extending the CALFED authorization from 2010 to 2014.

Requested funding for both the Central Valley Project Restoration Fund (CVPRF) and CALFED are lower than for FY2009. The House Appropriations Committee notes that the lower amount for the CVPRF is done to meet a statutory requirement to limit the three-year rolling average to no more than $50 million and does not represent an intent to reduce funding in future years. Both funds serve areas in California experiencing water supply reductions due to drought, as well as pumping restrictions due to stress on state- and federally listed fish species.

San Joaquin River Restoration Fund

Reclamation proposed an allocation of $15.9 million for the newly authorized San Joaquin River Restoration Fund for FY2010. The Fund was authorized by the enactment of Title X of the Omnibus Public Land Management Act of 2009 (P.L. 111-11), the San Joaquin River Restoration Settlement Act. The Fund is to be used to implement fisheries restoration and water management provisions of a stipulated settlement agreement for the *Natural Resources Defense Council et al. v. Rodgers* lawsuit and is to be funded through the combination of a reallocation of approximately $7.5 million annually in Central Valley Project Restoration Fund receipts from the Friant Division water users and accelerated payment of Friant water users' capital repayment obligations, as well as other federal and non-federal sources. Reclamation notes that "significant actions planned for initiation in FY2010 include releasing interim flows from Friant Dam and completion of a permit application for the reintroduction of spring-run Chinook salmon into the San Joaquin River for consideration by the National Marine Fisheries Service." Construction of Friant Dam in the 1940s and subsequent diversion of San Joaquin River water to off-stream agricultural uses blocked salmon migration and dewatered stretches of the San Joaquin, resulting in elimination of spring-run Chinook into the upper reaches of the river. One goal of the settlement is to bring back the salmon run; another is to reduce or avoid adverse water supply impacts to Friant Division long-term contractors. (For more information on the settlement agreement and 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).) The Senate bill would appropriate $7.0 million in CVP funding for the San Joaquin River Restoration, to be used in conjunction with and in advance of funds available from the San Joaquin River Restoration Fund. The conference agreement includes $5.0 million for this purpose.

Water Conservation Initiative

Reclamation proposed funding for a new program for FY2010—a Water Conservation Initiative (WCI). The proposal is similar to components of a program funded in FY2009—the Water for America Initiative. P.L. 111-8 provided $15.1 million for the Reclamation portion of the Water for America Initiative line item for FY2009 (the USGS was also to receive funding under the initiative); an additional $20.1 million was included for Endangered Species Recovery Implementation. The FY2010 request does not mention the Water for America Initiative. Instead, it includes a request of $46 million for the WCI, which includes $37 million for two components of last year's Water for America initiative (challenge grants and basin studies), and $9 million to fund portions of seven Title XVI projects (not included as part of the Water for America Initiative last year). The Water for America Initiative subsumed two previously existing Reclamation programs: Water 2025 (challenge grants) and the Water Conservation Field Services program.

The House Committee on Appropriations report did not discuss the WCI; however, the report notes that $100,000 will be provided for each Title XVI project pending the announcement of American Recovery and Reinvestment Act (ARRA, P.L. 111-5) funding and accurate projections of project needs. Reclamation has announced $134.3 million in ARRA funding for 27 projects—26 of which are in California. The Senate Committee on Appropriations encourages Reclamation to work with a lab at Utah State University to expand water quality monitoring among other things, as does the conference agreement.

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 FY2009 appropriations acts funded DOE programs at $34.2 billion. This sum included $7.5 billion for Advanced Technical Vehicles Manufacturing Loans, appropriated in the Continuing Resolution, P.L. 110-329. In addition, the ARRA (P.L. 111-5) appropriated $38.7 billion for selected DOE programs: primarily Conservation and Renewable Energy, Electricity Delivery, Fossil Energy R&D, Science, and Environmental Clean-up.

Table 7. Energy and Water Development Appropriations
Title III: Department of Energy

($ millions)

Program	FY2009 Approp.	FY2009 Stimulus	FY 2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Energy Supply and Conservation						
Energy Efficiency and Renewables	$2,178.5	$16,800.0	$2,318.6	$2,310.0	$2,234.0	$2,242.5
Electricity Delivery and Energy Reliability	137.0	4,500.0	208.0	193.0	179.5	172.0
Nuclear Energy	792.0	—	776.6	812.0	761.2	786.6
Total, Energy Supply and Conservation	3,107.5	21,300.0	3,287.9	3,270.0	3,174.7	3,201.1
Fossil Energy R&D	876.3	3,400.0	617.6	617.6	699.2	672.4
Clean Coal Technology	—	—	—	—	—	—
Naval Petrol. and Oil Shale Reserves	19.1	—	23.6	23.6	23.6	23.6
Strategic Petroleum Reserve	205.0	—	228.6	228.6	259.1	243.8
Northeast Home Heating Oil Rsrv.	9.8	—	11.3	11.3	11.3	11.3
Energy Information Administration	110.6	—	133.1	121.9	110.6	110.6
Non-Defense Environmental Cleanup	261.8	483.0	237.5	237.5	259.9	244.7
Uranium D&D Fund	535.5	390.0	559.4	559.4	588.3	573.9
Science						
High Energy Physics	795.7	232.4	819.0	819.0	813.0	810.5
Nuclear Physics	512.1	154.8	552.0	536.5	540.0	535.0
Basic Energy Sciences	1,572.0	555.4	1685.5	1,675.0	1,653.5	1,636.5
Bio. and Env. R&D	601.5	165.7	604.2	597.2	604.2	604.2
Fusion	402.6	91.0	421.0	441.0	416.0	426.0
Advanced Scientific Computing	368.8	157.1	409.0	409.0	399.0	394.0
Cong. Directed Proj.	93.7	—	—	37.7	41.2	76.9
Other	441.3	231.2	451.0	428.2	432.0	420.7
Adjustments	(15.0)	12.4	—	—	—	—
Total, Science	4,772.6	1,600.0	4,941.7	4,943.6	4,898.8	4,903.7

Program	FY2009 Approp.	FY2009 Stimulus	FY 2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
ARPA-E	—	400.0	10.0	—	—	—
Nuclear Waste Disposal	145.5	—	98.4	98.4	98.4	98.4
Departmental Admin. (net)	155.3	—	182.3	124.9	173.9	168.9
Office of Inspector General	51.9	15.0	51.4	52.0	51.9	51.9
Adv. Tech. Vehicles Manuf. Loan	7,510.0	10.0	20.0	20.0	20.0	20.0
Sec. 1705 Temp. Loan Guarantee	—	5,990.0	1,500.0[a]	—	—	—
National Nuclear Security Administration (NNSA)						
Weapons	6,380.0	—	6,384.4	6,320.0	6,468.3	6,384.4
Nuclear Nonproliferation	1,482.4	—	2,121.7	1,471.1	2,136.7	2,136.7
Naval Reactors	828.1	—	1,003.1	1,003.1	973.1	945.1
Office of Administrator	439.2	—	420.8	420.8	420.8	420.8
Total, NNSA	9,129.6	—	9,930.0	9,215.1	9,998.9	9,887.0
Defense Environmental Cleanup	5,657.3	5,127.0	5,495.8	5,381.8	5,763.9	5,642.3
Other Defense Activities	1,314.1	—	852.5	1,518.0	854.5	847.5
Defense Nuclear Waste Disposal	143.0	—	98.4	98.4	98.4	98.4
Total, Defense Activities	16,243.9	5,127.0	16,391.7	16,213.3	16,715.6	16,475.2
Power Marketing Administrations (PMA)						
Southeastern	7.4	—	7.6	7.6	8.6	7.6
Southwestern	28.4	—	44.9	44.9	44.9	44.9
Western	218.3	10.0	256.7	256.7	256.7	256.7
Falcon & Amistad O&M	3.0	—	2.6	2.6	2.6	2.6
Colo. River Basin	(23.0)	—	(23.0)	(23.0)	(23.0)	(23.0)
Total, PMAs	234.1	10.0	289.9	289.0	289.0	311.9
FERC (revenues)	273.4 (273.4)	—	298.0 (298.0)		298.0 (298.0)	298.0 (298.0)
Total, Title III	**34,239.0**	**38,725.0**	**28,406.8**	**26,876.8**	**27,398.2**	**27,111.4**

Sources: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45, H.Rept. 111-278.

a. The Administration, in its 2010 budget request, proposed changes in procedures for operating this loan program which the Congress concluded would cost an additional $1.5 billion. The proposed changes were not agreed to by the Congress.

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)

In President Obama's address to a joint session of Congress on February 24, 2009, he stressed that energy policy—in particular energy efficiency and renewable energy policy—would be a major focus of his Administration, which would be reflected in the FY2010 budget request. In the address, he stated that humankind's "survival depends on finding new sources of energy" and that one of the major functions of the American Recovery and Reinvestment Act (ARRA, P.L. 111-5) was designed to boost jobs for renewable energy industries such as wind and solar energy.

DOE's FY2010 request seeks $2.3186 billion for the EERE programs. Compared with the FY2009 appropriation, the FY2010 request would increase EERE funding by $390.1 million, or 20.2%. In addition to the regular FY2009 appropriation, however, the ARRA appropriated $17.05 billion (including $250 million provided for the Weatherization Program in P.L. 110-329) for EERE programs, and an additional $4.5 billion for Electricity Delivery and Energy Reliability. **Table 8** gives the programmatic breakdown of the regular appropriations and the ARRA supplement for EERE and EDER.

Table 8. Energy Efficiency and Renewable Energy Programs

($ millions)

Program	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Hydrogen/Fuel Cell Technologies	$169.0	$43.4	$68.2	$68.2	$190.0	174.0
Biomass and Biorefinery Systems	217.0	786.5[a]	235.0	235.0	235.0	220.0
Solar Energy	175.0	—	320.0	258.7	255.0	225.0
—Concentrating Solar Power (CSP)	30.0	—	78.4	—	30.0	—
Wind Energy	55.0	118.0	75.0	70.0	85.0	80.0
Geothermal Technology	44.0	400.0	50.0	50.0	50.0	44.0
Water Power (Hydro/Ocean)	40.0	—	30.0	40.0	60.0	50.0
Subtotal, Renew. and Hydrogen	700.0	1,347.9	778.2	721.9	875.0	793.0
Vehicle Technologies	273.2	—	333.3	378.3	323.3	311.4
Building Technologies	140.0	—	237.7	210.5	202.7	200.0
Industrial Technologies	90.0	50.0	100.0	100.0	100.0	96.0
Federal Energy Management	22.0	—	32.3	32.3	32.3	32.0
RE-ENERGYSE (Education)	—	—	115.0	7.5	0.0	0.0

Program	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Subtotal, Efficiency R&D	525.2	50.0	818.3	728.6	658.3	639.4
Facilities and Infrastructure	76.0	100.7[a]	63.0	63.0	63.0	63.0
Program Management	145.8	50.0	358.1	289.0	224.6	185.0
R&D Subtotal	1,447.0	1,548.6	2,017.6	1,802.4	1,820.9	1,680.4
Renewables Deployment	16.0	—	6.0	10.0	15.0	10.0[b]
Appliance Rebates	—	300.0	—	—	—	—
Adv. Battery Manufacturing	—	2,000.0	—	—	—	—
Transportation Electrification	—	400.0	—	—	—	—
Alternative Fueled Vehicles	—	300.0	—	—	—	—
Subtotal, Demon. and Deployment	16.0	3,000.0	6.0	10.0	15.0	10.0
Weatherization Grants	200.0	5,250.0[c]	220.0	220.0	200.0	210.0
State Energy Grants	50.0	3,100.0	75.0	75.0	50.0	50.0
Efficiency Block Grants	—	3,200.0	—	—	—	—
Non-specific EERE RDD&D	—	951.4	—	—	—	—
Cong.-Directed Assistance	228.8	—	—	157.6	148.1	292.1
Prior Year Balances	-13.2	0.0	0.0	0.0	0.0	0.0
Total Appropriation	1,928.5	17,050.0	2,318.6	2,265.0	2,233.0	2,242.5
Office of Electricity Delivery and Energy Reliability (OE)	137.0	4,500.0	208.0	193.0	179.6	172.0

Sources: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45, H.Rept. 111-278.

a. Facilities and Infrastructure includes $13.5 million for the Integrated Biorefinery Research Facility, for a total of $800.0 million in Biomass-related Recovery Act funding.

b. This amount is for Tribal Energy Activities. There is also a $10.0 million amount for International Renewable Energy in the funding for Program Support, under Program Management.

c. Includes $250 million supplementary appropriation in the FY2009 Continuing Resolution legislation, P.L. 110-329.

American Recovery and Reinvestment Act (P.L. 111-5)

The ARRA emphasizes jobs, economic recovery, and assistance to those most impacted by the recession.

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, $400 million for the Geothermal Program, $118 million for Wind Energy, $50 million for Industrial Technologies, $43.4 million for Fuel Cell Technologies (formerly Hydrogen Technologies), $87.2 million for Facilities and Infrastructure, and $50 million for Program Direction.

Further, the law provides $11.3 billion for grant programs, including $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).

Additionally, the law provides about $3.65 billion in transportation related grants, including $2.0 billion for Advanced Battery Manufacturing, $400 million for Transportation Electrification, $300 million for Alternative Fueled Vehicles.

Also, the law provides $4.5 billion to the Office of Electricity Delivery and Energy Reliability for grid modernization and related technologies, especially transmission development to support renewable energy. That amount includes funds for the smart grid and grid modernization provisions in the EISA (Title 13).

Regular FY2009 and FY2010 Appropriations Compared

The $390.1 million difference between the regular FY2009 appropriation and the FY2010 request results from several proposed increases and decreases for EERE programs. The request proposes one major increase, $115 million, that would create a new science and engineering education program entitled Regaining our Energy Science and Engineering Edge (RE-ENERGYSE). Other major proposed program funding increases would go to Solar Technologies ($145 million), Building Technologies ($97.7 million), Vehicle Technologies ($60.1 million), and State Energy grants ($25.0 million). Other proposed major cuts would include Congressionally-Directed Activities (-$228.8 million) and Fuel Cells (-$100.7 million). Smaller proposed program cuts would include Facilities (-$13.0 million), Water Technologies (-$10.0 million), and Renewable Deployment (-$10.0 million).

The House bill includes $2.250 billion for EERE, which is $321.5 million more than the FY2009 appropriation and $68.6 million less than the FY2010 request. Compared with the request, the House bill would provide major increases for Congressionally Directed Activities ($157.6 million) and for Vehicle Technologies ($40.0 million). The bill decreases RE-ENERGYSE by 107.5 million, Program Management by $69.1 million, Solar Technologies by $61.3 million, and Building Technologies by $27.2 million. In floor action, the House approved a $15.0 million increase over the reported bill, including $10.0 million more for the Water Power Technologies program and $5.0 million more for the Vehicle Technologies program, targeted for natural gas vehicles.

The Senate bill would appropriate $2.233 billion for EERE, $304.5 million more than the FY2009 appropriation and $17.0 million less than the House bill. Compared with the House bill, the Senate bill would provide a major increase for Hydrogen/Fuel Cell Technologies ($121.8 million) and significant increases for Water Power Technologies ($30.0 million) and Wind Technologies ($15.0 million). The Senate bill would zero out the DOE-proposed RE-ENERGYSE program. Compared to the House bill, the Senate would decrease Program Management by $64.4.5 million, Vehicle Technologies by $50.0 million, state energy grants by $25.0 million, and weatherization grants by $20.0 million. In floor action, the Senate approved an amendment to the reported bill that would designate $15.0 million of the funding for Industrial Programs for technical assistance grants.

Solar Energy Program Increase

The request would nearly triple spending for the Concentrating Solar Power (CSP) program and proposed three new solar subprogram focus areas: Systems Integration, Market Transformation, and the Solar Electricity Energy Innovation Hub. Two new subprogram activities would garner most (about $39 million) of the $54.1 million increase proposed for CSP funding. About $17 million would be provided for a high-temperature baseload power activity, which aims to develop CSP systems capable of operating competitively in the baseload power market by 2020. Meeting this goal would require CSP systems that operate at higher temperatures, which elevates system efficiency and enables cost reductions for thermal storage. About $22 million would be provided for a "Pilot Solar Zone." Under this activity, a land parcel would be developed in a way that facilitates the construction of utility-scale solar projects. The activity calls for DOE cooperation with the Bureau of Land Management (BLM) and solar developers to devise a model for addressing infrastructure (roads, water, transmission linkages) and conducting environmental studies.

The Systems Integration subprogram would receive a boost of $17.5 million to cover three main activities. System Modeling and Analysis assesses potential annual energy production based on pilot (model) projects, for example, photovoltaic system operations in a region with cloudy weather. Grid Integration activities focus on enabling high-penetration solar integration into end-use locations and the power grid, with an emphasis on life-cycle costs for inverters, storage, and other equipment. Grid access for CSP will be a key focus too. Resource and Safety activities aim to improve solar resource mapping and help industry select sites.

Market Transformation, a completely new subprogram, would aim to help reduce solar power costs and promote commercial use of solar technologies by identifying and breaking down market barriers and promoting deployment through stakeholder outreach. Some targeted areas of market barriers include interconnection standards, net metering, utility policies, solar access laws, policymaker understanding of solar technologies, and international safety issues. The subprogram would also aim to promote large-scale solar deployment. The Solar America Cities activity would assist 25 U.S. cities that have committed to using solar power by addressing implementation issues such as financing, permitting, city planning, stakeholder engagement, and grid integration. Also, the Solar America Showcases activity would provide technical assistance (not hardware purchases) to large-scale, high-visibility installations, such as new building communities, big box retailer installations, and utility-scale solar. The Solar Policy and Analysis Network (SPAN) is a new market transformation activity proposed for launch in FY2010. SPAN would help fulfill the need for analysis on local, state, regional, national, and international policies that promote solar market transformation by tapping into the expertise of the Nation's universities. In addition, SPAN aims to further solar professional development by attracting and educating a new generation of university students who can join the solar industry in various capacities.

Energy Innovation Hubs would address the basic science, technology, economics, and policy issues hindering the ability to become energy secure and economically strong while being good stewards of the planet by reducing greenhouse gas (GHG) emissions. The main focus of the Hub is to push the current state-of-the-art energy science and technology toward fundamental limits and support high-risk, high-reward research projects that produce revolutionary changes in how the United States produces and uses energy. The objective is to focus a high-quality team of researchers on a specific question and to encourage risk taking that can produce real breakthroughs. The Solar Electricity Energy Innovation Hub would be devoted to the discovery and design of wholly new concepts and materials needed by solar to electricity conversion.

The House bill would provide $258.7 million for Solar programs, about $61.3 million less than the request. No funding would be provided for the Solar Electricity Energy Innovation Hub. More generally, the Appropriations Committee's report expressed concern with DOE's proposal to establish eight Energy Innovation Hubs. The Committee found that the proposed new group of centers would have goals that overlap with other existing centers, which could lead to "confusion and redundancy." Further, the Committee found that there has been insufficient development of plans and implementation details for the proposed Hubs. However, the Committee said that it otherwise "believes that the Hubs are a promising concept," and it recommended $35 million to establish one Hub under the Office of Science.

The Senate bill would appropriate $255.0 million for Solar Technologies. From the amount provided, the report directed DOE to provide $30.0 million for Concentrating Solar. Also, the Committee "encourages" DOE to support R&D on "innovative textiles," such as solar cell roofing shingles. The Committee directed DOE to develop the PV Manufacturing Initiative consistent with the findings of workshops being conducted by the National Academy of Sciences. It also encouraged DOE to use an existing facility for the Initiative. In floor action, the Senate adopted the Committee's funding recommendations.

The conference report would appropriate $225.0 for the Solar Technologies Program. Funding would be provided for Concentrating Solar. No funding would be provided for the Solar Electricity Energy Innovation Hub.

Building Technologies Program Increase

Of the $97.7 million increase proposed for the Building Technologies program, the Emerging Technologies subprogram would get nearly half ($48.9 million). Within that subprogram, the proposed creation of an Energy Innovation Hub would get $35.0 million. The main focus of the Hub would be on energy efficient building systems design. This Hub would work on integrating smart materials, designs, and systems to tune building usage to better conserve energy, as well as maximizing the functioning of lighting, heating, air conditioning, and electricity to reduce energy demand. Other areas of interest include improved exterior shell materials, membranes of energy efficient windows, insulation, improved approaches to building design, systems control, and energy distribution networks.

The Residential Buildings Integration subprogram would get an increase of $18.1 million. The main goal is to develop cost effective, production-ready systems in five major climate zones that result in houses that produce as much energy as they use on an annual basis. The Zero Energy Home (ZEH) initiative in residential sector research would bring a new concept to homebuilders. A ZEH combines state-of-the-art, energy efficient construction and appliances with commercially available renewable energy systems such as solar water heating and solar electricity. The ZEH also has a cost component goal of net zero financial cost to the home owner.

The Senate Appropriations Committee recommended no funds for the proposed Equipment Standards and Analysis Hub. In floor action, the Senate approved the Committee's recommendation.

The conference report recommends $200.0 million and noted that $27.0 million should be provided for solid state R&D from within available funds. No funding would be provided for the Energy Efficient Building Systems Design Innovation Hub.

Vehicle Technologies Program Increase

Of the $60.1 million requested increase, the largest share (a net increase of nearly $39.0 million) would go to Hybrid Electric Systems. This subprogram includes all of the Vehicle Program efforts directly related to the planning and modeling, development, and evaluation of advanced hybrid (HEV), electric, and plug-in hybrid (PHEV) drive systems. The Hybrid Electric Systems subprogram funds R&D on advanced (passenger and commercial) vehicle technologies that could achieve significant improvements in fuel economy without sacrificing safety, the environment, performance, or affordability. Primary emphasis is given to the technologies that support development of advanced HEVs and PHEVs.

Within that subprogram, the Vehicle and Systems Simulation and Testing (VSST) activity would grow by about $32.2 million. This activity integrates the modeling, systems analysis, and testing efforts that support the Vehicle Program. The FY2010 increase would support expanded heavy vehicle systems modeling and development of technologies to reduce commercial vehicles' "parasitic" energy losses due to aerodynamic drag, friction and wear, under-hood thermal conditions, and accessory loads. It will also support increased testing of both commercial vehicles and passenger vehicles. A portion of the increase will also be used to expand the laboratory and field evaluation of advanced prototype and pre-production electric drive vehicles with dual energy storage systems and other advanced energy storage devices, electric motor and power electronics. VSST will also expand the evaluation of advanced HEVs and PHEVs in medium and heavy duty uses such as school buses, urban delivery vehicles, and transit buses.

Also within the Hybrid Electric Systems subprogram, the Advanced Power Electronics and Electric Motor R&D activity would get an increase of about $12.7 million. In FY2010, a new solicitation would be issued to fund industry R&D efforts to develop power electronics and electric motors associated with increased vehicle electrification. DOE states that electrification of light-duty vehicles has great potential to reduce dependence on oil imports, and advanced power electronics and electric motors are critical components for the successful deployment of advanced vehicles. The awards would enable substantial reductions in cost, weight, and volume, while ensuring a domestic supply chain. Emphasis would be placed on R&D for advanced packaging, enhanced reliability, and improved manufacturability. Awards would also accelerate the technology transfer from research organizations to domestic manufacturers and suppliers. The activity also supports R&D on inverters and motors (permanent magnet (PM) and non-PM), DC-to-DC converters, low-cost magnet materials, high temperature capacitors, advanced thermal systems, and motor control systems. Work would be expanded to address the more stringent performance requirements for PHEVs, including using the power electronics to provide plug-in capability by integrating the battery charging function into the traction drive, thereby reducing electric propulsion system cost. Activities focusing on advanced materials will be enhanced to enable the production of prototype devices to accelerate the process of transferring research results to device manufacturers.

The House bill would appropriate $40 million above the request. This increase would support technologies for hydrogen transportation, in order to continue activities that the request would eliminate from the former Hydrogen Technologies Program which DOE identified as the Fuel Cell Technologies Program. In floor action, the House approved the Committee's recommendation. However, a floor amendment added $5.0 million targeted for the development of natural gas vehicles. The Senate bill would zero out the Fuel Cells account, but would provide $190.0 million for the Hydrogen Technologies account and directed that DOE fund Fuel Cell work from that account.

The conference report would provide $7.5 million for coordination with the Biomass Program to support testing of intermediate fuel blends of ethanol and gasoline; $5.0 million for natural gas vehicle R&D, and $2.2 million (within available funds) for an analysis of light-duty vehicle transportation. The report does not include $40.0 million for hydrogen (as proposed by the House) and it does not include a study of recharging options (as proposed by the Senate).

Other EERE Directives

The House Appropriations Committee report calls on DOE to continue the effort to study the "green job economy," including the employment and macroeconomic effects of funding for DOE's clean energy programs. Also, it directs DOE to "continue implementing an aggressive program" to recruit staff from Historically Black Colleges and Universities and Hispanic Serving Institutions.

The Senate Appropriations Committee report includes numerous directives for EERE. There appear to be four key directives. First, the Committee directs that at least $35 million be provided for an RD&D strategy focused on algae biofuels. In particular, the Committee finds that algae could support large-scale biofuels production on non-arable land, using non-potable water, and potentially provide for the re-use of industrial carbon dioxide. Second, the Committee directs that the Wind Energy Program work with the Office of Electricity (OE) to increase deployment nationwide. Third, if DOE is able to fund certain facilities projects with money from ARRA, then the Committee said it would support DOE in using $44 million to fund its proposed Fuels from Sunlight and Energy Efficient Building Systems hubs at $22 million each. Fourth, from available funds under the Weatherization Program, the Committee directs DOE to use $35 million for a pilot project to improve home insulation and sealing in homes built before 1980 and $35 million for a pilot project that aims to use public private partnerships to increase the leverage of federal funds from less than even to $3 private for each $1 federal. Several other program directives would "carve out" funds for specific projects or studies, including ethanol use, water power technologies, geothermal technologies, and renewable energy demonstrations in Hawaii and on tropical biomass farms.

The conference report would direct that at least $35.0 million be made available, from within available funds, to prepare a comprehensive strategy for R&D and deployment algae biofuels. It would require DOE to prepare a five-year R&D plan for water power technologies. Also, the report would provide $292.1 million for congressionally directed activities. The report does not include a House-proposed reporting requirement to track the progress and impact of EERE investments.

Electricity Delivery and Energy Reliability Program

The FY2010 request would provide $208.0 million to the Office of Electricity Delivery and Energy Reliability (OE), which would be a $71.0 million (51.8%) increase above the FY2009 appropriation (excluding the ARRA funding). The increase is designed to coordinate with a major restructuring of the accounts to include four new major programs: Clean Energy Transmission and Reliability, Smart Grid R&D, Energy Storage, and Cyber Security for Energy Delivery Systems. The House bill provision is identical to the request. In floor action, the House reduced the OE recommendation to $193.0 million. The Senate bill would appropriate $179.6 million. The Committee recommended no funding for the Grid Materials, Devices, and Systems Hub and would provide $6.5 million for congressionally directed activities. The conference report would

provide $172.0 million for OE. No funds would be provided for the Grid Materials, Devices, and Systems Hub.

Nuclear Energy

The Obama Administration's FY2010 funding request for nuclear energy research and development totals $761.3 million—including advanced reactors, fuel cycle technology, infrastructure support, and security. The House provided $812.0 million, $50.4 million above the request and $20.0 million above the FY2009 level. The total FY2010 funding level approved by the Senate is the same as the Administration request.

According to DOE's FY2010 budget justification, the nuclear energy R&D program includes "generation, safety, waste storage and management, and security technologies, to help 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.

Although total funding in the FY2010 nuclear energy request is similar to levels in previous years, the Obama Administration is calling for significant priority changes. Funding for the Nuclear Power 2010 Program, which assists the near-term design and licensing of new nuclear power plants, would be largely eliminated. Research on producing hydrogen with nuclear reactors would stop entirely. The Advanced Fuel Cycle Initiative (AFCI), which had been the primary research component of the Bush Administration's Global Nuclear Energy Partnership (GNEP), would be renamed Fuel Cycle Research and Development and shifted away from the design and construction of nuclear fuel recycling facilities toward an emphasis on longer-term research. The House Appropriations Committee report called for DOE to submit a strategic plan on balancing long-term nuclear R&D with near-term deployment of new reactors.

Funding for the Mixed Oxide Fuel Fabrication Facility, which is to help dispose of surplus weapons plutonium, would be shifted from DOE's Office of Nuclear Energy to the Defense Nuclear Nonproliferation Program.

Nuclear Power 2010

Under President Bush, DOE's initial efforts to encourage near-term construction of new commercial reactors—for which there have been no new U.S. orders since 1978—focused on the Nuclear Power 2010 Program. The program provided up to half the costs of licensing lead plant sites and reactors and preparing detailed reactor designs. Nuclear Power 2010 also includes the Standby Support Program, authorized by the Energy Policy Act of 2005 (P.L. 109-58) to pay for regulatory delays that might be experienced by new reactors.

The Obama Administration proposed to cut the Nuclear Power 2010 Program's funding from $177.5 million in FY2009 to $20 million in FY2010 and then terminate the program. Administration of the Standby Support Program was to continue under the Office of Nuclear Energy program direction account. The House approved a funding level of $71.0 million for the program, to "complete the Department's commitment to this effort." The Senate voted to provide $120 million for the program, with no mention of program termination. The conference agreement provides $105.0 million "as the final installment" for the Nuclear Power 2010 program.

DOE's budget justification contended that industry interest in new nuclear power plants has now been demonstrated to the extent that federal funding is no longer needed. The $20 million requested for FY2010 was to provide the final assistance to an industry consortium called NuStart for licensing a new reactor at the Vogtle plant in Georgia. No further funding was to be provided for a second industry consortium led by Dominion Resources, or for the design of General Electric-Hitachi's ESBWR reactor or the Westinghouse AP-1000 reactor. "By FY 2010 sufficient momentum will have been created by the cost-shared programs that the vendors (GEH and Westinghouse) and other partners will have adequate incentive to complete any additional work through private funding," according to the DOE justification.

Generation IV

Advanced commercial reactor technologies that are not yet close to deployment are the focus of Generation IV Nuclear Energy Systems, for which $191.0 million was requested for FY2010, $11 million above the FY2009 appropriation. The budget request would have cut $24 million from activities previously conducted by the program, a reduction that "reflects the emphasis shifting from near-term R&D activities to those R&D activities aimed at long-term technology advances," according to the DOE justification. The request included $35 million to establish the Energy Innovation Hub for Modeling and Simulation, which would focus on computer assistance for the development, implementation, and management of nuclear power and radioactive waste. The House provided no funding for the Modeling and Simulation Hub, while boosting total Generation IV funding to $272.4 million. The Senate approved a funding level of $143 million, including the Modeling and Simulation Hub. The conference agreement provides $220.1 million, including $22.0 million for the Modeling and Simulation Hub.

The focus in the budget request on "long-term technology advances" differed sharply from the program's previous emphasis on developing the Next Generation Nuclear Plant (NGNP). Most of the FY2009 appropriation—$169.0 million—was for NGNP research and development. NGNP is currently planned to 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 was to continue until 2011, when a decision was to be made on moving to the Phase II design and construction stage, according to the FY2009 DOE budget justification. In its recommendation on the FY2009 budget, the House Appropriations Committee had provided additional funding "to accelerate work" on NGNP.

DOE's proposed FY2010 nuclear research program did not mention NGNP, although it included several research activities related to the development of VHTR technology, including fuel testing, graphite experiments, and development of VHTR simulation software. Fundamental research on other advanced reactor concepts, such as sodium-cooled fast reactors and molten salt reactors, were also to continue. For FY2010, the House Appropriations Committee report noted that NGNP had been one of its priorities and specified that at least $245.0 million of the Generation IV funding be devoted to the project. The Senate Appropriations Committee FY2010 report did not specifically mention NGNP, but it called for DOE to select two advanced reactor technologies as the focus of future research and potential deployment.

The conference agreement provides $169.0 million for NGNP and directs DOE within 90 days to prepare a detailed plan for moving forward with the NGNP project. The conference agreement also provides $17.8 million for other Generation IV reactor concepts and $10.0 million for research on extending the lives of existing light water reactors. No funding is provided for gas centrifuge enrichment technology.

The Energy Policy Act of 2005 authorized $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. The act's target date for operation of the demonstration reactor is September 30, 2021. The FY2010 budget request anticipated that Generation IV reactors "could be available in the 2030 timeframe."

Fuel Cycle Research and Development

Formerly called the Advanced Fuel Cycle Initiative, DOE's Fuel Cycle Research and Development program is to be redirected from the development of engineering-scale and prototype reprocessing facilities toward smaller-scale "long-term, science-based research." The FY2010 budget request for the program was $192.0 million, nearly $50 million above the FY2009 level, although $35 million of that amount was to go toward establishing an Energy Innovation Hub for Extreme Materials. The House provided no funding for the Extreme Materials Hub and an overall reduction in the request to $129.2 million, citing "the lack of specificity in terms of the direction of the research in this area." The Senate provided $145.0 million, the same as FY2009, and no funding for the Extreme Materials Hub. The conference agreement provides $136.0 million, with nothing for the Extreme Materials Hub.

According to the DOE budget justification, Fuel Cycle R&D will continue previous research on technology that could reduce the long-term hazard of spent nuclear fuel. 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. DOE plans to broaden the program to include waste storage technologies, security systems, and alternative disposal options such as salt formations and deep boreholes. R&D will also focus on needs identified by a planned DOE nuclear waste strategy panel, according to the justification.

In previous years, AFCI had been the primary technology component of the Bush Administration's GNEP program, including R&D on reprocessing technology and fast reactors that could use reprocessed plutonium. Funding for GNEP was eliminated by Congress in FY2009 and GNEP was not mentioned in the FY2010 budget request, although, as noted above, much of the related R&D work is to continue at a smaller scale.

The Energy Innovation Hub for Extreme Materials was intended to support fundamental research on advanced materials for use in high-radiation and high-temperature environments. Such materials could improve the performance of nuclear waste packages, allow advances in nuclear reactor designs, and improve the safety and operation of existing commercial reactors, according to the budget justification.

(For more information about nuclear reprocessing, see CRS Report RL34579, *Advanced Nuclear Power and Fuel Cycle Technologies: Outlook and Policy Options*, by (name redacted).)

Nuclear Hydrogen Initiative

The Obama Administration proposed to complete work being conducted under the Nuclear Hydrogen Initiative in FY2009 and provide no further funding in FY2010. The program, which received $7.5 million in FY2009, had been developing processes for producing hydrogen in nuclear reactors for use in transportation fuel cells and other applications. According to the DOE

budget justification, funding for the Nuclear Hydrogen Initiative will be shifted to "higher priority activities that are more directly related to the [Nuclear Energy Office] mission, such as waste management and storage, materials, and simulation." Both the House and the Senate agreed to zero out the program, as does the conference agreement.

Fossil Energy Research, Development, and Demonstration

For FY2010, the Obama Administration requested $617.6 million for Fossil Energy Research and Development; which represents a 29.5% decrease ($258.8 million) from the FY2009 appropriation (**Table 9**). The FY2010 request, however, is supplemented by $3.4 billion appropriated under the American Recovery and Reinvestment Act of 2009 (ARRA—P.L. 111-5), which is to be expended in FY2009 and FY2010.

No new funding has been requested for the Clean Coal Technology program, under the justification that all project funding commitments have been fulfilled and only project closeout activities remain.

No funding has been requested for the Clean Coal Power Initiative in FY2010 because of appropriations provided under ARRA.

No funding has been requested for the FutureGen project pending a program review. The project was originally intended to demonstrate clean coal-based Integrated Gasification Combined Cycle (IGCC) power generation with capture and sequestration of CO_2 emissions. However, in early 2008, after cost estimates for the project escalated to $1.8 billion, the Bush Administration restructured 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. Under a "Restructured FutureGen" program, DOE proposed a cost-shared collaboration with industry and anticipated making a number of awards ranging from $100 million to $600 million (DOE share). For FY2009, 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 that account was funded in ARRA at $1.52 billion. The FY2010 request has no funding for the Carbon Capture Initiative.

The President's request for Fuels and Power has been reduced $288.5 million (42%) from the prior year appropriation. No funding has been requested for Oil Technology under the justification that it is the Obama administration's policy not to fund government R&D for petroleum. The $29.9 million increase in the request for Carbon Sequestration supports an Energy Innovation Hub. The $25 million requested for Natural Gas represents a 25% increase over the prior year appropriation (the Bush administration had requested no funding). The $158 million requested for Program Direction represents a 4% increase of the prior year appropriation, not counting the additional $10 million appropriated under ARRA.

The House bill would appropriate $617.6 million for the Fossil Energy R&D program, the same as the President's budget request. However, the bill would reduce the carbon sequestration research by $35 million below the request, and would not fund the proposed Energy Innovation Hub. The bill also adds $25.45 million above the request for the Fuels program to fund research into the production of high purity hydrogen from coal.

The Senate bill would appropriate $699.2 million for Fossil Energy R&D, a 13.2% increase over the President's budget request. The bill provided no funds for the Clean Coal Power Initiative and

FutureGen because of substantial increases in the American Recovery and Reinvestment Act. The bill's $428.2 million for fuels and power systems is $24.3 million above the request, but Carbon Sequestration has been reduced $19.7 million below the request. The bill includes $5 million for Cooperative Research and Development.

In the Conference Report that accompanies H.R. 3183, conferees agree to provide $672.4 million for Fossil Energy R&D, out of which $36.9 million applies to Congressionally Directed Fossil Energy Projects. This represents a 23% ($204 million) reduction compared to FY2009's appropriation. Fuels and Power Systems, in particular, would receive $288.4 million less.

Table 9. Fossil Energy Research and Development

($ millions)

	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Clean Coal Technology						
Deferred Unobligated Balance	149.0	—	—	—	—	—
Transfer to Fossil Energy R&D	-149.0	—	—	—	—	—
Subtotal	0.0	—	0.0	—	—	—
Fossil Energy R&D Program		1,000.0	—	—	—	—
Clean Coal Power Initiative	288.2	800.0	—	—	—	—
FutureGen	0.0	—	0.0	—	—	—
Fuels And Power Systems						
Innovations for Existing Plants	50.0	—	41.0	41.0	58.0	52.0
Advanced IGCC	85.3	—	55.0	55.0	65.0	63.0
Advanced Turbines	28.0	—	31.0	31.0	32.0	32.0
Carbon Sequestration	150.0	—	179.9	144.9	160.2	154.0
Fuels	25.0	—	15.0	40.5	25.0	25.0
Fuel Cell	58.0	—	54.0	54.0	58.0	50.0
Advanced Research	28.0	—	28.0	28.0	30.0	28.0
Subtotal	692.4	—	403.9	394.4	428.2	404.0
Carbon Sequestration (new)						
Site Characterization		50.0	—	—	—	—
Training and Grants		20.0	—	—	—	—
Carbon Capture Demo. Int. (new)		1,520.0	—			
Natural Gas Technologies	20.0	—	25.0	25.0	25.0	17.3
Petroleum-Oil Technologies	—	—	—	—	—	—
Unconventional Fossil Energy Technologies (new)					25.0	20.0
Program Direction	152.0	10.0	158.0	158.0	158.0	158.0
Other						

	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Plant and Capital Equipment	18.0	—	20.0	20.0	20.0	20.0
Fossil Energy Environ. Restoration	9.7	—	10.0	10.0	10.0	10.0
Special Recruitment Program	0.7	—	0.7	0.7	0.7	0.7
Cooperative R&D	5.0	—	0.0	—	5.0	5.0
Subtotal	33.4	—	30.7	30.7	35.7	35.7
Cong. Directed Projects	43.9	—	0.0	9.6	27.3	36.9
Prior Year balance	70.3					
Total	**876.3**	**3,400.0**	**617.6**	**617.6**	**699.2**	**672.4**

Source: FY2009 Appropriations (P.L. 111-8); ARRA (P.L. 111-5); H.Rept. 111-203;S.Rept. 111-45.

Note: Unconventional Fossil Energy Technologies is new as proposed by the Senate report to replace the Oil Technologies Program.

In the FY2009 Appropriations (P.L. 111-8), $876.3 million was 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.

Under ARRA, $3.4 billion was appropriated for DOE fossil energy programs in FY2009. 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 CO_2 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.

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. Its current capacity is very nearly filled at 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, fill of the SPR has been principally accomplished with deliveries of royalty-in-kind (RIK) oil to the SPR, in lieu of cash royalties on offshore production paid to the federal government. Loans of crude oil from the SPR to keep refineries supplied after recent hurricanes were returned with a greater volume of oil returned than was borrowed. On May 13, 2008, the

House and Senate passed H.R. 6022 (P.L. 110-232), suspending RIK fill unless the price of crude oil fell below a specified threshold. Fill was resumed with RIK oil during FY2009 after the precipitous drop in the price of oil.

The Energy Policy Act of 2005 (EPACT) required expansion of the SPR to its authorized maximum of one billion barrels. Congress approved $205 million for the SPR program for FY2009, including $31.5 million to continue expansion activities at a site acquired during FY2008 in Richton, MS, that would eventually provide an additional 160 million barrels of capacity. The FY2010 budget request, at $229 million dollars, included $43.5 million for purchase of a cavern at Bayou Choctaw to replace a cavern posing environmental risks. The additional expense was to be offset by no new spending in FY2010 on expansion. The House approved the Administration request. The Senate Committee on Appropriations added $30 million to provide for engineering activities at the site chosen for expansion of the SPR in Richton, MS. The Committee expressed its position that it did not support any other activities at this time for expansion of the SPR. In conference, a Senate proposal was retained that would forbid the expenditure of funds appropriated for the SPR program to firms providing $1 million or more in refined products to Iran, or services, such as transportation, underwriting, and financing that facilitated exports of product to Iran, or expansion of Iranian refining capacity. The conference bill also includes $25 million to continue work at the site in Richton. The conference bill provides a total of $243.8 million.

Congress approved $9.8 million in the Omnibus Appropriations bill, P.L. 111-8, 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. The FY2010 request for the NHOR is $11.3 million, an increase of $1.5 million to finance the purchase of nearly 16,000 barrels of heating oil sold during FY2007. The House approved the Administration request for the NHOR, as did the Senate and the conferees.

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.[3] The Advanced Research Projects Agency–Energy (ARPA-E), a new organization separate from the Office of Science, was authorized by the America COMPETES Act (P.L. 110-69) to support transformational energy technology research projects.[4] For FY2010, DOE has requested $4.942 billion for the Office of Science, an increase of 4% from the regular FY2009 appropriation of $4.758 billion, and $10 million for ARPA-E, a reduction of 33% from the regular FY2009 appropriation of $15 million. Both offices also received substantial FY2009 funding in the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5): an additional $1.6 billion for the Office of Science and an additional $400 million for ARPA-E.[5] The House

[3] 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).

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

provided $4.944 billion for the Office of Science in FY2010. The Senate provided $4.899 billion. The conference report provided $4.904 billion. The House and Senate bills and the conference report all provided no new funds for ARPA-E.

The President's Plan for Science and Innovation would double the combined R&D funding of the Office of Science and two other agencies over the decade from FY2006 to FY2016.[6] This continues a plan initiated by the Bush Administration in January 2006 as part of its American Competitiveness Initiative. The 4% increase requested for FY2010 is less than the annual rate required to achieve the doubling goal, but because some ARRA funds will be spent during FY2010, actual expenditures during FY2010 are likely to be greater than the amount appropriated.

The requested funding for the largest Office of Science program, basic energy sciences, is $1.686 billion, up 7% from $1.572 billion in FY2009 (not including $555 million in the ARRA). Proposed increases include $34 million each for two innovation hubs,[7] one focused on materials for energy storage and the other on direct production of fuels from solar energy. For the first time, funding for the development and operation of scientific user facilities is identified as a separate subprogram; a proposed increase of $20 million for this subprogram would support full use of the facilities. The House report accepted the proposal to establish scientific user facilities as a separate subprogram. The Senate rejected it. The conference report was silent. The House provided a total of $1.675 billion for basic energy sciences, including one hub (to be selected at the Secretary's discretion) and $23 million more than the request for scientific user facilities. The Senate provided $1.654 billion, including both the requested hubs. The conference report provided $1.636 billion, including neither hub.

For high-energy physics, the request is $819 million, up 3% from $796 million in FY2009 (not including $232 million in the ARRA). Proposed increases include $31 million for construction of the NOνA detector at Fermilab and $12 million for U.S. activities in support of upgrades at the Large Hadron Collider (LHC). The House provided the requested amount. The Senate provided $813 million and questioned increased support for the LHC in light of the program's current technical difficulties.[8] The conference report provided $810 million.

The request for biological and environmental research is $604 million, up less than 1% from $602 million in FY2009 (not including $166 million in the ARRA). This program's two subprograms have been slightly renamed, and $100 million has been moved between them, but the changes are

(...continued)

[5] In the regular FY2009 appropriation, funding for ARPA-E was provided in the Science account, which otherwise funds only the Office of Science. Subsequent ARPA-E funding appears in FY2010 budget documents in a separate account called either Advanced Research Projects Agency–Energy or Energy Transformation Acceleration Fund.

[6] See Executive Office of the President, Office of Science and Technology Policy, *The President's Plan for Science and Innovation: Doubling Funding for Key Basic Research Agencies*, May 7, 2009, online at http://www.ostp.gov/galleries/budget/doubling.pdf.

[7] DOE is proposing to initiate a total of eight innovation hubs in FY2010, funded in various accounts. The aim of the hubs is to assemble multidisciplinary teams to address interdependent challenges in basic science, technology, economics, and policy. The House funded only one of the eight. The Senate funded five. The conference report funded three.

[8] See, for example, "CERN: LHC Restart Delayed for Months," *Science Insider*, July 21, 2009. Online at http://blogs.sciencemag.org/scienceinsider/2009/07/cern-restart-de.html.

organizational, with little impact on program content. The House provided $597 million. The Senate bill and the conference report both provided the requested amount.

For nuclear physics, the request is $552 million, up 8% from $512 million in FY2009 (not including $155 million in the ARRA). All four research subprograms would receive increases. Isotope development and production (transferred from the Office of Nuclear Energy in FY2009) would receive a reduction of $6 million. The conference report provided expressed concern about the state of U.S. isotope production but provided "not less than" the requested amount for the isotope development and production subprogram. The Senate report proposed funding nuclear medicine applications research in the nuclear physics program, but the conference report funded that activity in the biological and environmental research program as in previous years. The House provided a total of $536 million for nuclear physics. The Senate provided $540 million. The conference report provided $535 million.

The request for fusion energy sciences is $421 million, up 5% from $403 million in FY2009 (not including $91 million in the ARRA). The request includes an $11 million increase for the U.S. share of the International Thermonuclear Experimental Reactor (ITER), a fusion facility now under construction in France. 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%. According to estimates released in December 2007, that amount will be between $1.45 billion and $2.2 billion, with a completion date between FY2014 and FY2017. Press reports refer to "ballooning costs and growing delays" and the likelihood that "only a skeletal version" of ITER will be built, at least initially.[9] A revised official estimate of ITER's cost and schedule is expected in late FY2010 or FY2011. The House provided $20 million more than the request, to be spent on laser fusion research at the Naval Research Laboratory. The Senate provided $416 million. The conference report provided $426 million, including "no explicit funding" for the Naval Research Laboratory.

The request for the smallest Office of Science research program, advanced scientific computing research, is $409 million, up 11% from $369 million in FY2009 (not including $157 million in the ARRA). Proposed increases include $13 million for design of computer architectures for science and $12 million for the Leadership Computing Facility at Argonne National Laboratory. The House provided the requested amount. The Senate provided $399 million. The conference report provided $394 million.

The request for Office of Science laboratory infrastructure is $134 million, down 8% from $145 million in FY2009 (not including $198 million in the ARRA). No new funds are requested for excess facilities disposition, which DOE expects to be fully funded under the ARRA. The House and Senate bills provided the requested amount. The conference report provided $128 million.

The request for ARPA-E is $10 million, down 33% from $15 million in FY2009 (not including $400 million in the ARRA). This is a new program. DOE budget documents describe its mission as overcoming long-term, high-risk technological barriers to the development of energy technologies. The House provided no new funds for ARPA-E because of the ARRA funds that remain available. The House committee report stated that "the decision not to provide any

[9] Geoff Brumfiel, "Fusion Dreams Delayed," *Nature*, May 28, 2009, p. 488. Online at http://www.nature.com/news/2009/090527/pdf/459488a.pdf.

additional funding ... does not in any way suggest a lack of commitment to this program by the Committee." The Senate and the conference report also provided no new funds for ARPA-E.

Nuclear Waste Disposal

DOE's Office of Civilian Radioactive Waste Management (OCRWM) is responsible for management and disposal of highly radioactive waste from nuclear power plants and defense facilities. Under the Nuclear Waste Policy Act (NWPA, 42 U.S.C. 10101 et seq.), the only candidate site for permanent disposal of such waste is Yucca Mountain, Nevada. DOE filed a license application with the Nuclear Regulatory Commission for the proposed Yucca Mountain repository in June 2008.

The Obama Administration has decided to "terminate the Yucca Mountain program while developing nuclear waste disposal alternatives," according to the DOE FY2010 budget justification. Alternatives to Yucca Mountain are to be evaluated by a "blue ribbon" panel of experts convened by the Administration. At the same time, according to the justification, the NRC licensing process for the Yucca Mountain repository is to continue, "consistent with the provisions of the Nuclear Waste Policy Act."

The FY2010 OCRWM budget request of $198.6 million sought only enough funding to continue the Yucca Mountain licensing process and to evaluate alternative policies, according to DOE. The request was about $90 million below the FY2009 funding level, which was nearly $100 million below the FY2008 level. More than 2,000 waste program contract employees were to be terminated during FY2009, according to the budget justification. Most of the program's remaining work is to be taken over by federal staff.

All work related solely to preparing for construction and operation of the Yucca Mountain repository is being halted, according to the DOE budget justification. Such activities include development of repository infrastructure, waste transportation preparations, and system engineering and analysis.

The House agreed with the Administration's plans to provide funding solely for Yucca Mountain licensing activities and for a blue-ribbon panel to review waste management options. The House approved the Administration budget request, including $5 million for the blue-ribbon review. However, the House-passed bill specified that the review must include Yucca Mountain as one of the alternatives, despite the Administration's contention that the site should no longer be considered. According to the House Appropriations Committee report, "It might well be the case that an alternative to Yucca Mountain better meets the requirements of the future strategy, but the review does not have scientific integrity without considering Yucca Mountain." The House panel also recommended that at least $70 million of the program's funding be devoted to maintaining expertise by the Yucca Mountain Project management contractor to support the licensing effort, rather than relying entirely on federal staff. The Senate also recommended approval of the Administration request, but without any restrictions on the blue-ribbon panel.

Funding for the nuclear waste program is provided under two appropriations accounts. The Administration's FY2010 request is divided evenly between an appropriation from the Nuclear Waste Fund, which holds fees paid by nuclear utilities, and the Defense Nuclear Waste Disposal account, which pays for disposal of high-level waste from the nuclear weapons program. The Senate Appropriations Committee report called for the Secretary of Energy to suspend fee

collections, "given the Administration's decision to terminate the Yucca Mountain repository program while developing disposal alternatives."

The conference agreement provides the reduced funding requested by the Administration and includes bill language that states, "$5,000,000 shall be provided to create a Blue Ribbon Commission to consider all alternatives for nuclear waste disposal." That is the same language that appeared in the House-passed bill, along with House Appropriations Committee instructions that the Blue Ribbon panel include Yucca Mountain as a disposal option. However, the Conference Committee Joint Explanatory Statement states that "all guidance provided by the House and Senate reports is superseded by the conference agreement."

Additional funding from the Nuclear Waste Fund for the Yucca Mountain licensing process was included in the NRC budget request. The House provided the full $56 million requested, while the Senate voted to cut the request to $29 million. The conference agreement includes the Senate reduction.

NWPA required DOE to begin taking waste from nuclear plant sites by January 31, 1998. Nuclear utilities, upset over DOE's failure to meet that deadline, have won two federal court decisions upholding the department's obligation to meet the deadline and to compensate utilities for any resulting damages. Utilities have also won several cases in the U.S. Court of Federal Claims. DOE estimates that liability payments would eventually total $11 billion if DOE were to begin removing waste from reactor sites by 2020, the previous target for opening Yucca Mountain.[10] (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 and Direct Loans

Congress established the DOE Innovative Technology Loan Guarantee Program with Title XVII of the Energy Policy Act of 2005 (P.L. 109-58). The act authorized loan guarantees for energy projects using "new or significantly improved technologies" to reduce greenhouse gas emissions.

The FY2009 omnibus funding measure (P.L. 111-8) provided DOE with loan guarantee authority of $47 billion, to remain available indefinitely, in addition to previously approved authority of $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 FY2010 budget request proposed no changes in DOE's loan guarantee authority, but it requested an increase in administrative funding from $19.9 million in FY2009 to $43.0 million in FY2010, to be entirely offset by fees. The House and Senate approved the Administration request, as did the conference agreement.

Additional loan guarantees of up to $60 billion for renewable energy and electric transmission projects were provided by the American Recovery and Reinvestment Act (P.L. 111-5). Unlike the loan guarantee authority provided by the appropriations measures, project sponsors under P.L.

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

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. However, $2 billion of that funding has since been transferred to the "cash for clunkers" automobile trade-in program by P.L. 111-47.

A related DOE program, the Advanced Technology Vehicles Manufacturing Loan Program, was established by the Energy Independence and Security Act of 2007 (P.L. 110-140). The FY2009 Continuing Resolution appropriated $7.5 billion to allow DOE to issue up to $25 billion in direct loans. No additional appropriations for loans were sought for FY2010, but DOE requested $20 million in new funding for administrative expenses, which is included in the conference agreement. The program is to provide loans to eligible automobile manufacturers and parts suppliers for making investments in their plant capacity to produce vehicles with improved fuel economy.

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—and 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	P.L. 111-5	P.L. 111-8	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conference
DSW	0	1,590.2	1,514.7	1,472.5	1,527.7	1,505.9
Campaigns	0	1,620.4	1,559.7	1,593.6	1,589.2	1,571.2
RTBF	0	1,674.4	1,736.3	1,779.3	1,848.9	1,842.9
Other[a]	0	1,495.1	1,573.7	1,474.6	1,502.5	1,464.5
Total	**0**	**6,380.0**	**6,384.4**	**6,320.0**	**6,468.3**	**6,384.4**

Sources: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45, H.Rept. 111-278.

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. For FY2010, "Other" includes Secure Transportation Asset, Nuclear Counterterrorism Incident Response, Facilities and Infrastructure Recapitalization Program, Site Stewardship, Defense Nuclear Security, Cyber Security, congressionally directed projects, and use of prior year balances.

The FY2010 request document includes data from NNSA's Future Years Nuclear Security Program (FYNSP), which projects the budget and components through FY2014 (see **Table 11**).

Table 11. NNSA Future Years Nuclear Security Program

($ millions)

	FY2011	FY2012	FY2013	FY2014
DSW	1522.2	1485.8	1531.4	1553.5
Campaigns	1497.4	1491.6	1474.2	1487.2
RTBF	1736.8	1770.9	1736.5	1694.2
Other[a]	1600.2	1602.1	1597.8	1600.2
Total	**6356.6**	**6350.5**	**6339.9**	**6335.1**

Source: DOE, *FY2010 Congressional Budget Request,* Vol. 1 (NNSA), p. 54.

Note: Details may not add to totals because of rounding.

a. Includes Secure Transportation Asset, Nuclear Counterterrorism Incident Response, Facilities and Infrastructure Recapitalization Program, Site Stewardship, Defense Nuclear Security, and Cyber Security.

Nuclear Weapons Complex Reconfiguration

Although the nuclear weapons complex (the "Complex") currently consists of eight sites, 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*, coordinated by (name redacted).) 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." The Senate Appropriations Committee 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.[11] This plan is more fully described in the Final Complex Transformation Supplemental Programmatic Environmental Impact Statement released in October 2008, along with two Records of Decision of December 2008.[12]

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 [Reliable Replacement Warhead], 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;
> (3) determination of the size and nature of the nuclear weapons complex needed to support that future stockpile.[13]

In keeping with this approach, the committee recommended eliminating funds for RRW and for several programs described below. In its FY2009 report, the Senate Appropriations Committee also recommended eliminating funds for RRW and made various changes to individual programs. It did not provide general comments on Complex transformation. P.L. 111-8 provided no funds for RRW. Similarly, the FY2010 budget requests no funds for RRW. Another FY2010 budget document states, "The Administration proposes to cancel development of the Reliable Replacement Warhead (RRW)—a new design warhead intended to replace the current inventory of nuclear weapons—because it is not consistent with Presidential commitments to move towards a nuclear-free world."[14]

[11] 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.

[12] 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.complextransformationspeis.com/project.html.

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

[14] U.S. Executive Office of the President. Office of Management and Budget, *Terminations, Reductions, and Savings: Budget of the U.S. Government, Fiscal Year 2010*, 2009, p. 55, http://www.whitehouse.gov/omb/budget/fy2010/assets/trs.pdf.

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. An LEP for the B61 mods 7 and 11 bombs was completed in FY2009; no funds are requested for it for FY2010. An LEP for the W76 warhead for the Trident II submarine-launched ballistic missile is ongoing. P.L. 111-8 provided $202.9 million for that purpose; the FY2010 request is $209.2 million. Life-extended W76 warheads are designated W76-1; the first such warhead entered the stockpile in February 2009.[15] The House bill would increase the request for the W76-1 to $233.2 million. It expressed its concern that NNSA's request for the W76-1 "does not reflect the needs of military clients" and "directs NNSA to explicitly highlight in its future budget requests any instance in which its budget request will not support the military requirements of its Air Force and Navy clients." The Senate bill would appropriate the amount requested. The conference bill includes $223.2 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. P.L. 111-8 provided $328.5 million; the FY2010 request is $390.3 million. Of the eight warhead types listed, the largest program under stockpile systems is for the B61 bomb, $59.5 million for B61 sustainment and $65.0 million to complete a B61 Phase 6.2/6.2A refurbishment study. The House bill would appropriate the sustainment funds as requested and no funds for the latter study. It "will not support a major warhead redesign in the absence of clearly defined nuclear weapons strategy, stockpile, and complex plans." The Senate bill also includes the amount requested. The conference bill includes $357.8 million, of which $92.0 million is included for B61 stockpile systems activities. The bill provides that "upon completion of the Nuclear Posture Review and confirmation of the requirement for the B61-12, the NNSA is authorized to reallocate an additional $15,000,000 within the Stockpile Systems activities to support the continuation of the B61-12 non-nuclear upgrade study … [and that] no funds may be obligated or expended for B61-12 nuclear components without prior approval by the Appropriations Committees of the House and Senate." The conference agreement calls for two reports on the B61-12.
- 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."

[15] 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.

WDD involves interim storage of warheads to be dismantled; dismantlement; and disposition (i.e., storing or eliminating warhead components and materials). P.L. 111-8 appropriated $190.2 million. The FY2010 request is $84.1 million; the House bill would appropriate $108.9 million and the Senate bill the amount requested. The conference bill includes $96.1 million. Within WDD, the major activity for FY2009 was the Pit Disassembly and Conversion Facility (PDCF), which has been moved to the Readiness in Technical Base and Facilities account for FY2010. 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. In FY2008, MFFF was transferred from NNSA to DOE's Office of Nuclear Energy. WDD includes a Waste Solidification Building (WSB) to convert liquid wastes from PDCF and MFFF into solids for disposal off-site. For FY2010, the WSB account has been moved to the Fissile Materials Disposition Program within Defense Nuclear Nonproliferation.

- Stockpile Services. This category includes Production Support; R&D Support; R&D Certification and Safety; Management, Technology, and Production; and pit work. P.L. 111-8 provided $866.4 million for Stockpile Services. The FY2010 request is $831.1 million; the House bill recommended $805.1 million. Pit work has undergone several changes. For FY2008, it was divided into Pit Manufacturing and Pit Manufacturing Capability. The explanatory statement for H.R. 1105 (P.L. 111-8) stated that in the FY2009 request, "[t]hese two functions were not well defined or delineated." As a result, the bill provided a single appropriation of $155.3 million for Plutonium Capability, a reduction from $198.8 million for the two FY2008 pit accounts. For FY2010, NNSA changed the name of Plutonium Capability to Plutonium Sustainment, and requests $149.2 million. NNSA states that FY2010 Plutonium Sustainment "activities will be focused on sustaining the pit manufacturing infrastructure and manufacturing W88 pits to meet stockpile surveillance requirements." The W88 is a warhead for the Trident II (D-5) submarine-launched ballistic missile. The House bill recommended $123.2 million for Plutonium Infrastructure Sustainment, $26.0 million below the request, to produce W88 pits at a minimum rate to maintain plutonium capability. The Senate bill includes $844.1 million, including an increase of $30 million to support subcritical experiments at the Nevada Test Site, and no funds to implement a transfer of tritium responsibilities as included in NNSA's Complex Transformation plan. The conference bill includes $828.8 million.
- Reliable Replacement Warhead. This program sought to develop a warhead initially to replace W76 warheads. Congress eliminated FY2008 and FY2009 funds for developing this warhead. For FY2010, the Administration proposes to cancel the program and NNSA requests no funds for it.

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 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 FY2010 request includes five campaigns:

- Science Campaign. According to NNSA, this campaign "develops improved scientific capabilities and experimental infrastructure to assess the safety, security, reliability, and performance of the nuclear explosives package (NEP) portion of weapons without reliance on further underground testing." P.L. 111-8 provided $316.7 million; the FY2010 request is also $316.7 million. The House bill has $296.4 million. Regarding campaigns generally, the Senate Appropriations Committee stated, "The Committee does not believe this [requested] level of funding is adequate to support modernization of the complex." The Senate bill includes $319.7 million for the Science Campaign, the conference bill includes $295.6 million.
- Engineering Campaign. This campaign seeks "to develop capabilities to assess and improve the safety, reliability, and performance of the non-nuclear and nuclear explosive package engineering components in nuclear weapons without further underground testing." P.L. 111-8 provided $150.0 million, and the FY2010 request is also $150.0 million. A component of this campaign is Enhanced Surety to develop improved means of safety, security, and use control for nuclear weapons. In the explanatory statement on H.R. 1105, the House and Senate Appropriations Committees "strongly support improved surety," and P.L. 111-8 provided $46.1 million for Enhanced Surety, non-RRW. "Non-RRW" specifies that surety is not to be enhanced through RRW: a goal of RRW was to enhance surety, but Congress denied funding for that program. The House bill includes $174.1 million for FY2010, of which $66.1 million is only for Enhanced Surety, and "directs that priority for Enhanced Surety go to those weapon types at greatest long-term risk." The Senate and conference bills include the amount requested.
- 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, controversy waned as the program progressed. The facility was dedicated in May 2009, with key experiments expected to begin in 2010.[16] P.L. 111-8 provided $436.9 million for this campaign. The FY2010 request is also $436.9 million; the House bill would appropriate $461.9 million, the Senate bill, $453.4 million; and the conference bill, $457.9 million.
- Advanced Simulation and Computing Campaign. This campaign develops computation-based models of nuclear weapons that integrate data from other

[16] Lawrence Livermore National Laboratory, "Dedication of World's Largest Laser Marks the Dawn of a New Era," press release, May 29, 2009, https://publicaffairs.llnl.gov/news/news_releases/2009/NR-09-05-05.html.

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. P.L. 111-8 provided $556.1 million; the FY2010 request is also $556.1 million. According to the explanatory statement on H.R. 1105, "The budget submitted by NNSA has a striking lack of detail regarding he NNSA's computing strategy, acquisition plan … [raising] the concern that the acquisition strategy for new [computing] platforms will not fit within the available budget." The statement directed NNSA to report on several aspects of this campaign, with the report having independent review and a six-month deadline (September 11, 2009). For FY2010, the House bill would appropriate $561.1 million, an increase of $5.0 million. It specified that $5.0 million be used for "technology assessments of nuclear weapons that could be employed by sub-state actors or potentially hostile minor nuclear powers." The Senate Appropriations Committee stated that this campaign needs more resources in the future and the Senate bill would appropriate $566.1 million. The conference bill includes $567.6 million.

- Readiness Campaign. This campaign develops technologies and techniques to improve the safety and efficiency of manufacturing and reduce its costs. P.L. 111-8 provided $160.6 million. The FY2010 request is $100.0 million, and the House, Senate, and conference bills include that amount. NNSA explains that it made most of the reduction "to support higher priority work."

Readiness in Technical Base and Facilities (RTBF)

This program funds infrastructure and operations at nuclear weapons complex sites. P.L. 111-8 provided $1,674.4 million. The FY2010 request is $1,736.3 million, and the House bill would appropriate $1,779.3 million, adding funds above the request for operations at Pantex Plant and Y-12 Plant. The Senate bill would appropriate $1,848.9 million "to fill significant gaps in infrastructure development at the NNSA facilities." The conference bill includes $1,842.9 million. RTBF has six subprograms. By far the largest is Operations of Facilities (P.L. 111-8, $1,163.3 million; FY2010 request, $1,342.3 million; conference bill, $1,348.3 million). Others include Program Readiness, which supports activities occurring at multiple sites or in multiple programs (P.L. 111-8, $71.6 million; FY2010 request, $73.0 million; conference bill, $73.0 million); Material Recycle and Recovery, which recovers plutonium, enriched uranium, and tritium from weapons production and disassembly (P.L. 111-8, $70.3 million; FY2010 request, $69.5 million; conference bill, $69.5 million); and Construction (P.L. 111-8, $314.5 million; FY2010 request, $203.4 million; conference bill, $303.9 million).

The most costly and controversial item in Construction is the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (P.L. 111-8, $97.2 million; FY2010 request, $55.0 million). CMRR would replace a building over 50 years old that, among other things, houses research into plutonium and supports pit production at Los Alamos. In considering the FY2008 budget, the House Appropriations Committee stated, "Proceeding with the CMRR project as currently designed will strongly prejudice any nuclear complex transformation plan. The CMRR facility has no coherent mission to justify it unless the decision is made to begin an aggressive new nuclear warhead design and pit production mission at Los Alamos National Laboratory." In contrast, the Senate Appropriations Committee stated, "The

current authorization basis for the existing CMR [facility] lasts only through 2010, as it does not provide adequate worker safety or containment precautions. However, deep spending cuts ... will likely result in delays that will require the laboratory to continue operations in the existing CMR facility."

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." 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 $125.0 million, an increase of $24.8 million, for CMRR "to make up for [previous] funding shortfalls." For FY2010, the House bill includes $55.0 million for CMRR, and the Senate bill, $98.0 million. The conference bill provides $97.0 million.

Another major proposed facility is the Uranium Processing Facility (UPF) at Y-12 Plant. The House Appropriations Committee stated that the budget does not permit construction of UPF and CMRR at the same time, and that UPF would incorporate high security and would have nonproliferation benefits.[17] Accordingly, the House bill would appropriate $101.5 million for UPF, $50.0 million above the request. The Senate bill would appropriate $94.0 million, and the conference bill includes that amount.

Other Programs

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

- Secure Transportation Asset: provides for safe and secure transport of nuclear weapons, components, and materials. It includes special vehicles for this purpose, communications and other supporting infrastructure, and threat response. P.L. 111-8 provided $214.4 million. The FY2010 request is $234.9 million; the conference bill includes that amount.
- Nuclear Weapons Counterterrorism Response (House Appropriations Committee terminology) or Nuclear Weapons Incident Response (Senate Appropriations Committee terminology): "responds to and mitigates nuclear and radiological incidents worldwide and has a lead role in defending the Nation from the threat of nuclear terrorism." P.L. 111-8 provided $215.3 million. The FY2010 request is $221.9 million; the conference bill includes that amount.
- Facilities and Infrastructure Recapitalization Program (FIRP): "continues its mission to restore, rebuild and revitalize the physical infrastructure of the nuclear security enterprise." It focuses on "elimination of legacy deferred maintenance." P.L. 111-8 provided $147.4 million. The FY2010 request is $154.9 million; the conference bill includes $93.9 million.

[17] The benefit referred to is for downblending uranium (i.e., mixing the fissile uranium isotope 235 with the nonfissile isotope 238), resulting in uranium that can be used as fuel in a nuclear power plant but not in a terrorist nuclear bomb.

- Site Stewardship seeks to "ensure environmental compliance and energy and operational efficiency throughout the nuclear security enterprise." It is a new program, consolidating several earlier programs. Its FY2010 request is $90.4 million. The House Appropriations Committee said it supports the program but made a reduction due to "budget limitations." The House bill includes $62.4 million. The Senate bill includes $61.3 million and denies funding for the stewardship planning initiative because "the mission priorities are poorly defined." The conference bill provides $61.3 million.
- Safeguards and Security consists of two elements. (1) Defense Nuclear Security provides operations, maintenance, and construction funds for protective forces, physical security systems, personnel security, and the like. P.L. 111-8 provided $735.2 million. The FY2010 request is $749.0 million. The House bill has $789.0 million, adding funds for security upgrades and for improved training and equipment. The Senate bill includes the amount requested. The conference bill provides $769.0 million. (2) Cyber Security seeks to "ensure that sufficient information technology and information management security safeguards are implemented throughout the NNSA enterprise to adequately protect the NNSA information assets." P.L. 111-8 provided $121.3 million. The FY2010 request is $122.5 million, and the conference bill includes that amount.

P.L. 111-8 provided $22.8 million for congressionally directed projects. For FY2010, the House bill includes $3.0 million for one such project and the Senate bill has no such projects. The conference bill provides $3.0 million.

Nonproliferation and National Security Programs

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

Table 12. DOE Defense Nuclear Nonproliferation Programs

($ millions)

Program	FY2009 Approp.	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Nonproliferation and Verification R&D	$363.8	$297.3	$297.3	$337.3	$317.3
Nonproliferation and International Security[a]	150.0	207.2	187.2	187.2	187.2
International Materials Protection, Control and Accounting (MPC&A)	400.0	552.3	592.1	552.3	572.1
Elimination of Weapons-Grade Plutonium Production	141.3	24.5	24.5	24.5	24.5
Fissile Materials Disposition[b]	41.8	701.9	36.4	701.9	701.9
Global Threat Reduction Initiative	395.0	353.5	353.5	333.5	333.5
Cong. Dir. Projects	1.9	—	0.3	—	0.3
Use of prior-year balances	-11.5	—	—	—	—
Total	**1,482.4**	**2,136.7**	**1,471.2**	**2,136.7**	**2,136.7**

Sources: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45.

Note: Numbers may not add due to rounding.

a. Includes funding for two formerly separate programs: Russian Transition Initiatives and HEU Transparency Implementation.

b. Funding for MOX plant was transferred to Nuclear Energy, and Pit Disassembly plant to NNSA for FY2009. The FY2010 budget request would return the MOX project to Defense Nuclear Nonproliferation. The House bill would transfer the MOX project and the Waste Solidification Building to Other Defense Activities. The Senate Appropriations Committee recommended following the Administration's proposed transfer.

Funding for these programs in FY2009 was $1.482 billion. The Obama Administration requested $2.137 billion for FY2010 for Defense Nuclear Nonproliferation, but most of this increase results from returning two major construction projects, the Mixed-Oxide (MOX) plant and the Waste Solidification Building, to the Fissile Materials Disposition program from other parts of DOE. (See below.) The House bill, which does not include the transfer of the construction projects, would appropriate $1.4712 billion. The Senate bill, which includes the transfer, would appropriate $2.1367 billion. The conference bill appropriates $2.1367 billion, the same as the Senate bill.

The Nonproliferation and Verification R&D program was funded at $363.8 million for FY2009. The request for FY2010 was $297.3 million, and the House bill would appropriate the same amount. The Senate bill includes $337.3 million for this program. The conference amount is $317.3 million. Nonproliferation and International Security programs include international safeguards, export controls, and treaties and agreements. The FY2010 request for these programs was $207.0 million, compared with $150.0 million appropriated for FY2009. The House bill included $187.2 million, the Senate bill and the conference bill the same.

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 $400.0 million in FY2009; the FY2010 request was $552.3 million. The House bill would provide $592.1 million, and the Senate bill would provide the requested $552.3 million. The conference bill appropriates $572.1 million. Elimination of Weapons-Grade Plutonium Production is aimed at persuading Russia to shut down three nuclear reactors that produce weapons-grade plutonium and also supply power to several communities. Two of the three reactors were shut down in 2008 and their power replaced by a refurbished fossil-fueled facility. The third plutonium-producing reactor will be replaced by construction of another fossil-fueled facility. The program was funded at $141.3 million for FY2009; the request for FY2010 was $24.5 million. The House and Senate bills would appropriate that amount, and the conference bill does also.

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, SC, 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, and that amount was appropriated.

However, for FY2010 the Obama Administration proposed returning the MOX plant and the Waste Solidification Building to the Nonproliferation program, and requested a total of $701.9 million for Fissile Materials Disposition. The request justification notes that "DOE and its Russian counterpart agency, Rosatom, agreed on a financially and technically credible program to dispose of Russian surplus weapon-grade plutonium in November 2007." The program would rely on Russian fast reactors "operating under certain nonproliferation restrictions," according to the budget document. The House Appropriations Committee did not agree with this move, and the House bill would transfer the projects to Other Weapons Activities, reducing Fissile Materials Disposition to $36.4 million. The Senate bill agrees with the Administration's project transfer and would appropriate the requested $701.9 million, and the conference bill appropriates the Senate number.

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

In 1989, DOE established what is now the Office of Environmental Management to consolidate the cleanup of former nuclear weapons sites. Cleanup includes disposal of large amounts of radioactive and other hazardous wastes, management and disposal of surplus nuclear materials, remediation of soil and groundwater contamination, and decontamination and decommissioning of excess buildings and facilities. Cleanup of sites where the federal government conducted civilian nuclear energy research is also carried out by the Office of Environmental Management.

Over 100 federal facilities[18] 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.[19] 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 large 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 billion and $260 billion.[20] DOE expects that additional funds will be needed at many facilities to operate, maintain, and monitor cleanup remedies over the long term. At sites where the cleanup remedy involves the permanent containment of radioactive wastes, such long-term activities may need to be continued indefinitely because of the lengthy periods of time required for radioactivity to decay to acceptable levels.

[18] 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.

[19] 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.

[20] 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.

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.[21] (See Title I.) Once cleanup of a FUSRAP site is complete, the Corps is responsible for 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. 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. Appropriations for both of these offices are discussed below.

Office of Environmental Management

Three accounts fund the Office of Environmental Management: Defense Environmental Cleanup, Non-Defense Environmental Cleanup, and the Uranium Enrichment Decontamination and Decommissioning (D&D) Fund. Defense Environmental Cleanup by far constitutes the largest portion of funding for the Office of Environmental Management. The conference report on H.R. 3183 would provide a total of $5.64 billion for Defense Environmental Cleanup in FY2010. Prior to conference, the House had proposed $5.38 billion, and the Senate had proposed $5.76 billion. The President had requested $5.50 billion. Congress appropriated $5.66 billion for Defense Environmental Cleanup in FY2009.

The conference report would provide $244.7 million for Non-Defense Cleanup in FY2010. Prior to conference, the House had proposed $237.5 million, the same as the President requested. The Senate had proposed $259.8 million. Congress appropriated $281.8 million for FY2009. For the Uranium Enrichment D&D Fund account, the conference report would provide $573.9 million in FY2010. Prior to conference, the House had proposed $559.4 million, the same as the President requested. The Senate had proposed $588.3 million. Congress appropriated $535.5 million to the Uranium Enrichment D&D Fund account in FY2009.

The above comparisons to the FY2009 appropriations reflect the amounts provided in the FY2009 Omnibus Appropriations Act (P.L. 111-8). In addition to these "regular" appropriations, the Office of Environmental Management received a total of $6.0 billion in supplemental appropriations for FY2009 in the ARRA (P.L. 111-5). Per the law, DOE is to obligate the funds by the end of FY2010 (September 30, 2010). Of the $6 billion in supplemental appropriations, $5.13 billion was allocated to Defense Environmental Cleanup, $483 million to Non-Defense Cleanup, and $390 million to the Uranium Enrichment D&D Fund account.[22]

In its FY2010 budget justification, DOE stated that it was not going to use the FY2009 supplemental funding to accelerate the scheduled cleanup of larger sites. Instead, the funds would be directed to what the Office of Environmental Management calls "footprint reduction" and finishing up projects that are nearing completion. DOE asserts that such activity has the potential to reduce maintenance costs and yield significant cleanup progress. DOE also stated that its

[21] 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.

[22] See DOE's Recovery Act website for the breakout of funding that the Office of Environmental Management has obligated among individual cleanup sites: http://www.energy.gov/recovery/index.htm.

approach in allocating the funding "will allow thousands of blue-collar workers to be hired with limited training required," thus addressing the economic stimulus goals of the ARRA.

In its report on H.R. 3183, the House Appropriations Committee directed DOE to update certain elements of the Department's most recent report on its cleanup progress to reflect the impacts of the additional resources provided in the ARRA and appropriations anticipated for FY2010. DOE released its last report in January 2009, presenting funds spent on cleanup through FY2007, estimating the remaining costs from FY2008 through the completion of cleanup, and identifying cleanup "milestones."[23] These milestones are binding deadlines for the completion of cleanup actions to which DOE has agreed with federal and state regulators in formalized agreements at each site. In recent years, the adequacy of funding for DOE to achieve these milestones has been an issue. The committee drew attention to the significant increase in funding for FY2009 provided in the ARRA, and indicated its expectation that these additional resources should allow scheduled milestones to be met in FY2009. The committee directed DOE to update its cleanup progress report by April 1, 2010.

The pace of cleanup has been of particular concern at the largest sites that present the greatest environmental risks, including Hanford in the State of Washington, the Savannah River site in South Carolina, and the Idaho National Laboratory. These sites present some of the most complex cleanup challenges resulting from decades of nuclear weapons production, and therefore receive the greatest portions of funding for the Office of Environmental Management. For Hanford, the conference report would provide $2.09 billion in FY2010. The House has proposed $1.95 billion, and the Senate had proposed $2.12 billion. The President had requested $2.00 billion. The conference report would provide $1.21 billion in FY2010 for the Savannah River site, the same as the President requested. The House had proposed $1.19 billion, and the Senate had proposed $1.24 billion. For the Idaho National Laboratory, the conference report would provide $464.2 million in FY2010. The House had proposed $475.0 million, and the Senate had proposed $470.2 million. The President had requested $406.2 million.

Funding needs at these sites are expected to continue for decades. DOE estimates that cleanup may not be complete at Hanford until as late as 2062, at the Savannah River site until 2040, and at the Idaho National Laboratory until 2037.[24] These lengthy horizons in part are due to the time that will be needed to treat and dispose of substantial volumes of high-level radioactive wastes stored at each of these sites. According to DOE's most recent estimate, there are a total of 54 million gallons of high-level wastes 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.[25]

These high-level wastes are intended to be permanently disposed of in a geologic repository, but the removal and treatment of the wastes to prepare them for disposal presents many technical difficulties. The lack of availability of a geologic repository presents other challenges. Delays in the construction of facilities needed to treat the wastes have raised concern about environmental risks from the potential release of untreated wastes still stored in the tanks. Some of the tanks at Hanford are known or suspected to have leaked wastes into groundwater that discharges into the Columbia River. DOE routinely monitors water quality in the Columbia River to determine

[23] 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.

[24] Ibid., p. 79.

[25] Ibid., pp. 23-24.

whether contaminant levels are within federal and state standards. There has been similar concern about the possible contamination of the Snake River from the tank wastes at the Idaho National Laboratory, and the Savannah River itself from the tank wastes at DOE's Savannah River site.

There also has been rising interest in the source of funding for the cleanup of three uranium enrichment facilities administered by the Office of Environmental Management. These facilities are located at Paducah, KY; Portsmouth, OH; and Oak Ridge, TN. Title XI of the Energy Policy Act of 1992 (P.L. 102-486) established the Uranium Enrichment D&D Fund to pay for the cleanup of these facilities. To support this fund, P.L. 102-486 authorized the collection of assessments from nuclear utilities, and payments by the federal government from appropriations out of the General Fund of the U.S. Treasury, as both nuclear utilities and the United States benefitted from the production of enriched uranium. The authority to collect the utility assessments, and the authorization of appropriations for the federal payment, expired on October 24, 2007. Congress has continued federal payments to the fund through the annual appropriations process without enacting reauthorizing legislation.

Whether to reauthorize the Uranium Enrichment D&D Fund has been an issue, as its remaining balance does not appear sufficient to pay the estimated costs to complete the cleanup of the federal enrichment facilities. As of the end of FY2008, the Office of Management and Budget (OMB) reported that $4.5 billion remained available in the Uranium Enrichment D&D Fund for appropriation by Congress, far less than DOE's estimated range of $15 billion to $29 billion that may be needed to meet all outstanding cleanup needs over the long-term. If the fund is insufficient to pay for the cleanup, P.L. 102-486 states that DOE is responsible for the costs, subject to appropriations by Congress.

To help offset the federal payment and to increase overall resources to meet projected long-term funding needs, the President proposed to reinstate the utility assessments, and included $200 million in estimated collections in his FY2010 budget request. Neither the conference report on H.R. 3183, nor the original House and Senate bills, included the $200 million in offsetting collections in FY2010. Reauthorizing legislation first must be enacted before the assessments could be collected and made available for appropriation. So far in the 111th Congress, at least two bills have been introduced to reauthorize the utility assessments, H.R. 2471 and S. 1061. Although the utility assessments have not been reauthorized to date, the conference report on H.R. 3183 did include $463 million within the Defense Environmental Cleanup account to continue the federal payment to the Uranium Enrichment D&D Fund in FY2010, the same as the House and Senate had proposed, and the President had requested.

On another matter related to the Uranium Enrichment D&D Fund account, the conferees on H.R. 3183 highlighted DOE's recent plan to expand cleanup work at the Portsmouth uranium enrichment plant. The conferees observed that the President had not included any funding in his budget request to finance this more recently planned work. The conferees noted the Department's intent to finance this work instead with an "off-budget barter strategy for federal uranium assets." The conferees raised questions about the financial viability of this strategy, and directed the Government Accountability Office (GAO) to evaluate DOE's management of federal uranium assets and the Department's "success or failure" in meeting federal budgetary objectives through the sale of these materials.

Table 13 presents funding levels proposed for FY2010 for the accounts that fund DOE's Office of Environmental Management, compared to appropriations enacted for FY2009. A breakout is provided for sites and activities in which there has been broad interest within Congress.

Table 13. Appropriations for the Office of Environmental Management

($ millions)

Accounts	FY2009 Approp.	FY2009 Stimulus	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Defense Environmental Cleanup						
Accelerated Closure Sites	$45.9		$41.5	$41.5	$41.5	$41.5
Hanford						
2012 and 2035 Completions	*967.0*		*903.1*	*851.3*	*1,023.1*	*990.1*
Office of River Protection	*1,009.9*		*1,098.0*	*1,098.0*	*1,098.0*	*1,098.0*
Hanford Total	1,976.9		2,001.1	1,949.3	2,121.1	2,088.1
Savannah River Site	1,227.1		1,209.9	1,194.9	1,243.0	1,209.9
Idaho National Laboratory	475.8		406.2	475.0	470.2	464.2
Oak Ridge Reservation	262.8		153.8	202.8	153.8	178.8
Waste Isolation Pilot Plant	231.7		220.3	230.3	235.3	230.3
NNSA Sites	320.9		276.6	276.6	291.6	284.1
Technology Development	32.3		55.0	35.0	55.0	20.0
Safeguards and Security	260.3		279.4	279.4	296.4	279.4
Program Direction	309.8		355.0	200.0	355.0	345.0
Program Support	33.9		34.0	34.0	34.0	34.0
Uranium Enrichment D&D	463.0		463.0	463.0	463.0	463.0
Congressionally Directed Projects	17.9		—	—	4.0	4.0
Use of Prior Year Funds	-1.1		—	—	—	—
Subtotal Defense Environmental Cleanup	**5,657.3**	**5,127.0**	**5,495.8**	**5,381.8**	**5,763.9**	**5,642.3**
Non-Defense Environmental Cleanup						
Facility Accounts	277.7		237.5	237.5	259.8	244.7
Congressionally Directed Projects	4.8		—	—	—	—
Use of Prior Year Funds	-0.7		—	—	—	—
Subtotal Non-Defense Environmental Cleanup	**281.8**	**483.0**	**237.5**	**237.5**	**259.8**	**244.7**
Uranium Enrichment D&D Fund[a]	**535.5**	**390.0**	**559.4**	**559.4**	**588.3**	**573.9**
Uranium Enrichment D&D Fund Offset	**-463.0**	**—**	**-463.0**	**-463.0**	**-463.0**	**-463.0**
Proposed Domestic Utility Fee Receipts[b]	**—**	**—**	**-200.0**	**—**	**—**	**—**
Total Office of Environmental Management[c]	**5,991.6**	**6,000.0**	**5,629.7**	**5,715.7**	**6,149.0**	**5,997.9**

Source: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45, and H.Rept. 111-278.

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.

b. The President's FY2010 budget proposes to reauthorize the collection of domestic utility fees on nuclear power utilities that expired in 2007. These fees contributed to the Uranium Enrichment D&D Fund. Resumption of their collection would be dependent upon the enactment of reauthorizing legislation, which has not occurred to date. Accordingly, neither the conference report on H.R. 3183, nor the House or Senate bills, included the $200 million in utility fees to offset the appropriations for FY2010.

c. The FY2009 appropriation of $5.99 billion for the Office of Environmental Management, excluding the stimulus supplemental, reflects $20 million in offsets, due to a transfer of $10 million from DOE's Office of Science, and a transfer of $10 million from the National Nuclear Security Administration within DOE.

Office of Legacy Management

Once a facility is cleaned up under DOE's Office of Environmental Management[26] 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.[27] The conference report on H.R. 3183 would provide $189.8 million in FY2010 for the Office of Legacy Management, the same as the House and Senate had proposed prior to conference, and the same as the President had requested. Congress appropriated $186.0 million for the Office of Legacy Management in FY2009.

It also should be noted that Congress began to fund all facilities administered under the Office of Legacy Management entirely within the "Other Defense Activities" account of DOE in FY2009. 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. As in FY2009, the conference report on H.R. 3183 would provide this Office's funding in FY2010 entirely within the Other Defense Activities account of DOE.

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).)

[26] 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.

[27] 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.

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 Obama Administration's FY2010 request for the PMAs was $288.9 million. This is an overall increase of $8.3 million (23.1%) compared with the FY2009 request. The individual requests for each PMA are: SEPA, $7.6 million; SWPA, $44.9 million; and WAPA, $256.7 million. In addition, $2.6 million was requested for Falcon and Amistad operations and maintenance. The House and Senate bills includes spending at the levels requested by the Administration.

The FY2010 budget also proposes the permanent reclassification of receipts from mandatory to discretionary to offset the annual expenses of the Western, Southwestern, and Southeastern Power Marketing Administrations to allow for better operations and maintenance planning and execution, leading to a more reliable power system. Reclassification of these receipts would be achieved through legislation with a 2010 impact for all of the PMAs of $189.384 million.[28]

ARRA provided $10 million in non-reimbursable appropriations to WAPA to support implementation of activities authorized in section 402 of the act. ARRA also provided WAPA borrowing authority for the purpose of planning, financing or building new or upgraded electric power transmission lines to facilitate the delivery of renewable energy resources constructed by or expected to be constructed after the date of enactment. This authority to borrow from the United States Treasury is available to WAPA on a permanent, indefinite basis, with the amount of borrowing outstanding not to exceed $3.25 billion. WAPA has established a new Transmission Infrastructure Program for this purpose. In approving the Administration's budget request, the SCA directs WAPA to work with its firm power customers in developing annual work plans.

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). ARRA increased the amount of borrowing that BPA conducts under the Transmission System Act by $3.25 billion to the current authority for $7.7 billion in bonds outstanding to the Treasury.

This FY2010 budget proposes Bonneville accrue expenditures of $3.029 billion for operating expenses, $105 million for Projects Funded in Advance, $846 million for capital investments, and $420 million for capital transfers in FY2010. The budget has been prepared on the basis of Bonneville's major areas of activity, power and transmission. BPA published in the Federal Register its initial proposal for power and transmission rates for the FY2010 and FY2011 rate period in February 2009 and expects to complete the rate case by August 2009.

[28] U.S. Department of Energy, *FY 2010 Congressional Budget Request, Power Marketing Administrations*, DOE/CF-040, Volume 6, May, 2009, p. 12, http://www.cfo.doe.gov/budget/10budget/Content/Volumes/Volume6.pdf.

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 14. Energy and Water Development Appropriations
Title IV: Independent Agencies

($ millions)

Program	FY2009 Approp.	FY2010 Request	House H.R. 3183	Senate H.R. 3183	Conf.
Appalachian Regional Commission	$75.0	$76.0	$76.0	$76.0	$76.0
Nuclear Regulatory Commission	1,045.5	1,071.1	1,071.1	1,071.8	1,066.8
(Revenues)	(870.6)	(887.2)	(887.2)	(911.5)	(911.5)
Net NRC (including Inspector General)	174.8	183.9	183.9	159.7	155.7
Defense Nuclear Facilities Safety Board	25.0	26.1	26.1	26.1	26.1
Nuclear Waste Technical Review Board	3.8	3.9	3.9	3.9	3.9
Denali Commission	11.8	12.0	12.0	12.0	12.0
Delta Regional Authority	13.0	13.0	13.0	13.0	13.0
Northern Border Regional Commission	—	—	3.0	—	1.5
Southern Crescent Regional Commission	—	—	0.5	—	0.3
Fed. Coord. Alaska Gas Projects	4.4	4.5	4.5	4.5	4.5
Total	**302.4**	**319.3**	**322.8**	**295.1**	**291.8**

Source: FY2010 budget request, H.Rept. 111-203, S.Rept. 111-45.

Key Policy Issues—Independent Agencies

Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) requested $1.071 billion for FY2010 (including $10.1 million for the inspector general's office), an increase of $25.6 million from the FY2009 funding level. The House endorsed the full NRC request, including funding for licensing the proposed Yucca Mountain nuclear waste repository. The Senate provided the full request for NRC, plus a slight increase for the inspector general, and included a higher revenue offset that resulted in a net appropriation level that was $24.3 million below the total request. The conference agreement provides $1.067 billion, including $10.9 million for the inspector general. Major activities conducted by NRC include safety regulation and licensing of commercial nuclear reactors and oversight of nuclear materials users.

The NRC budget request included $248.3 million for new reactor activities, largely to handle new nuclear power plant license applications. Until recently, no new commercial reactor construction applications had been submitted to NRC since the 1970s. However, volatile fossil fuel prices, the possibility of controls on carbon emissions, and incentives provided by the Energy Policy Act of

2005 prompted electric utilities to apply for licenses for 26 reactors since September 2007, with several more expected through 2010.

NRC's proposed FY2010 budget also included $56.0 million from the Nuclear Waste Fund for licensing DOE's proposed Yucca Mountain nuclear waste repository, for which the license application was submitted June 3, 2008. NRC's FY2009 appropriation for Yucca Mountain licensing was $49.0 million, but NRC noted that previously appropriated funding raised the total FY2009 spending level to $59.0 million. The House provided the full NRC request for Yucca Mountain licensing, but the Senate cut the amount to $29.0 million. The conference agreement included the lower Senate level. The Obama Administration has pledged to halt the Yucca Mountain repository and find alternative strategies for handling nuclear waste, but it has allowed the Yucca Mountain licensing process to continue. However, Senator Reid, a long-time opponent of the proposed Yucca Mountain repository, announced on July 29, 2009, that the Administration had agreed to terminate the Yucca Mountain licensing effort in the FY2011 budget request.

For reactor oversight and incident response, NRC's FY2010 budget request included $263.2 million, about $2 million above the FY2009 level. 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 re dacted).)

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 FY2010 request would have resulted in a net appropriation of $183.9 million, an increase of $9 million from FY2009. The House approved the requested FY2010 net appropriation, while the Senate-passed net appropriation was $159.7 million. The net appropriation in the conference agreement, including the inspector general, is $154.7 million.

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