Congressional Research Service
Informing the legislative debate since 1914

Energy and Water Development: FY2008 Appropriations

Updated January 31, 2008

Congressional Research Service
https://crsreports.congress.gov
RL34009

CRS REPORT
Prepared for Members and
Committees of Congress

Summary

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

Key budgetary issues involving these programs include

- the distribution of Army Corps of Engineers appropriations across the agency's authorized construction and maintenance activities (Title I);
- support of major ecosystem restoration initiatives, such as Florida Everglades (Title I) and California "Bay-Delta" (CALFED) (Title II);
- funding for the proposed national nuclear waste repository at Yucca Mountain, Nevada, and proposals to store nuclear spent fuel temporarily (Title III: Nuclear Waste Disposal); and
- the Administration's proposed Global Nuclear Energy Partnership to supply plutonium-based fuel to other nations (Title III: Nuclear Energy).

The FY2008 Energy and Water Development bill was enacted as Division C of the Consolidated Appropriations Act for FY2008 (P.L. 110-161). The omnibus funding measure was passed by Congress December 19, 2007, and signed by the President December 26, 2007. The act provides $31.4659 billion for Energy and Water programs, about $1 billion below the FY2007 appropriation and about $500 million above the Administration's request.

The House Appropriations Committee reported out its FY2008 Energy and Water Development Appropriations bill, H.R. 2641 (H.Rept. 110-185), on June 6, 2007. The bill as reported did not contain indications of funding for specific projects. On June 20 the bill was debated on the House floor, but was not voted on pending submission by the Appropriations Committee of a supplement specifying funding for individual projects. That supplement was voted by the committee July 12, and the House approved the bill July 17, 2007.

The Senate Subcommittee on Energy and Water Development Appropriations approved its version of the bill on June 26, and the full Senate Appropriations Committee approved it June 28, 2007 (S. 1751, S.Rept. 110-127).

Contents

Most Recent Developments ... 1
Status ... 1
Overview ... 1
Title I: Army Corps of Engineers ... 3
Key Policy Issues—Corps of Engineers ... 3
Project Backlog and Agency Priorities ... 3
Everglades ... 5
Hurricane Katrina Repairs and Coastal Louisiana Restoration ... 6
Title II: Department of the Interior ... 6
Central Utah Project and Bureau of Reclamation: Budget In Brief ... 7
Key Policy Issues—Bureau of Reclamation ... 8
Background ... 8
CALFED ... 8
Loan Guarantee Program ... 9
Security ... 9
Water 2025 ... 9
General Provisions ... 9
Title III: Department of Energy ... 10
Key Policy Issues—Department of Energy ... 12
Energy Efficiency and Renewable Energy ... 12
Electricity Delivery and Energy Reliability ... 13
Nuclear Energy ... 14
Fossil Energy Research, Development, and Demonstration ... 19
Strategic Petroleum Reserve ... 21
Science ... 22
Nuclear Waste Disposal ... 24
Loan Guarantees ... 25
Nuclear Weapons Stockpile Stewardship ... 25
Nonproliferation and National Security Programs ... 36
Environmental Management ... 38
Power Marketing Administrations ... 45
Title IV: Independent Agencies ... 46
Key Policy Issues—Independent Agencies ... 47
Nuclear Regulatory Commission ... 47
For Additional Reading ... 47
CRS Products ... 47

Tables

Table 1. Status of Energy and Water Development Appropriations, FY2008 ... 1
Table 2. Energy and Water Development Appropriations, FY2001 to FY2008 ... 2
Table 3. Energy and Water Development Appropriations Summary ... 2
Table 4. Energy and Water Development Appropriations Title I: Army Corps of Engineers ... 3

Table 5. Energy and Water Development Appropriations Title II: Central Utah Project Completion Account 6
Table 6. Energy and Water Development Appropriations Title II: Bureau of Reclamation 7
Table 7. Energy and Water Development Appropriations Title III: Department of Energy 10
Table 8. Energy Efficiency and Renewable Energy Programs 13
Table 9. Fossil Energy Research and Development Programs 19
Table 10. Energy Policy Act of 2005 Title IV Authorization 21
Table 11. Funding for Weapons Activities 26
Table 12. NNSA Future Years Nuclear Security Program 26
Table 13. DOE Defense Nuclear Nonproliferation Programs 36
Table 14. Environmental Management Program Appropriations 41
Table 15. Office of Legacy Management Appropriations 45
Table 16. Energy and Water Development Appropriations Title IV: Independent Agencies 46

Contacts

Author Information 48

Most Recent Developments

The FY2008 Energy and Water Development bill was enacted as Division C of the Consolidated Appropriations Act for FY2008 (P.L. 110-161). The omnibus funding measure was passed by Congress December 19, 2007, and signed by the President December 26, 2007. The act provides $31.4659 billion for Energy and Water programs, about $1 billion below the FY2007 appropriation and about $500 million above the Administration's request.

The Bush Administration's FY2008 budget request was released in February 2007. The House Appropriations Committee reported out its FY2008 Energy and Water Development Appropriations bill, H.R. 2641, on June 6, 2007. The bill as reported did not contain indications of funding for specific projects. On June 20 the bill was debated on the House floor, but was not voted on pending submission by the Appropriations Committee of a supplement specifying funding for individual projects. That supplement was voted out by the committee July 12, and the House approved the bill July 17, 2007.

The Senate Subcommittee on Energy and Water Development Appropriations approved its version of the bill, S. 1751, on June 26, and the full Senate Appropriations Committee approved it June 28.

Energy and Water Development programs were funded for FY2007 in the Revised Continuing Appropriations Resolution, 2007 (H.J.Res. 20, P.L. 110-5). On March 16, 2007, the Department of Energy (DOE) submitted its "operating plan" to Congress, detailing funding for individual programs not specifically identified in P.L. 110-5.

Status

Table 1. Status of Energy and Water Development Appropriations, FY2008

Subcommittee Markup		House Report	House Passage	Senate Report	Senate Passage	Conf. Report	Final Approval		Public Law
House	Senate						House	Senate	
5/30/07	6/26/07	H.Rept. 110-185	7/17/07	S.Rept. 110-127	None	None	12/19/07	12/18/07	P.L. 110-161

Overview

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

Table 2 includes budget totals for energy and water development appropriations enacted for FY2001 to FY2008.

Table 2. Energy and Water Development Appropriations, FY2001 to FY2008

(budget authority in billions of current dollars)

FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08
23.9	25.2	26.1	26.7	30.2[a]	36.7[b]	29.4	31.5

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

a. For FY2005 and later, total includes DOE programs formerly funded in the Interior and Related Agencies appropriations bill and transferred to the Energy and Water Development appropriations bill.

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

Table 3 lists totals for each of the bill's four titles. It also lists several "scorekeeping" adjustments of accounts within the four titles, reflecting various expenditures or sources of revenue besides appropriated funds. These adjustments affect the total amount appropriated in the bill but are not included in the totals of the individual titles. Amounts listed in this report are derived from the Administration's FY2008 Congressional Budget Requests, from H.Rept. 110-185, to accompany H.R. 2641, from the S.Rept. 110-127, to accompany S. 1751, and from the explanatory statement for the FY2008 Consolidated Appropriations Act (H.R. 2764, P.L. 110-161).

Table 3. Energy and Water Development Appropriations Summary

($ millions)

Title	FY2007	FY2008 Request	House	Senate	Final
Title I: Corps of Engineers	$5,340.2	$4,871.0	$5,584.4	$5,448.1	$5,587.1
Title II: CUP & BOR	1,054.7	1,001.4	1,065.4	1,144.3	1,150.9
Title III: Department of Energy	24,228.2	24,762.7	25,243.1	25,896.9	24,446.6
Title IV: Independent Agencies	306.0	251.5	237.8	301.0	281.3
E&W Subtotal	**30,794.1**	**30,863.6**	**32,130.7**	**32,790.2**	**31,465.9**
Scorekeeping Adjustments					
Undistributed Pay Raise	33.0				
Title II					
Central Valley	(44.0)	(51.6)	(51.6)	(51.6)	NA
Title III					
Colorado River Basins, WAPA	(23.0)	(23.0)	(23.0)	(23.0)	NA
Uranium Fund	(446.0)	(463.0)	(463.0)	(463.0)	NA
Excess Fees FERC	(19.2)	(17.5)	(17.5)	(17.5)	NA
E&W Total	**30,294.9**	**30,308.5**	**31,575.6**	**32,235.1**	**NA**

Source: Administration FY2008 budget request; H.Rept. 110-185; S.Rept. 110-127. Consolidated Appropriations Act, 2008, P.L. 110-161.

Note: Details may not add to totals due to rounding. Includes the across-the board rescission (Sec. 312). NA: Not available.

Tables 4 through **16** 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 FY2005-FY2006.

Title I: Army Corps of Engineers

P.L. 110-161 provided $5.587 billion for the U.S. Army Corps of Engineers; it was an increase over the Administration's budget request of $4.871 billion and 5% above the FY2007 appropriations (not including supplemental funds) of $5.340 billion. The omnibus funding measure rescinded a total of $4.9 million of prior appropriations for the Corps.

Funding for the Corps' civil works program is often a contentious issue between the Administration and Congress, with final appropriations typically providing more funding than requested, regardless of which political party controls the White House and Congress. Generally around 85% of the appropriations for the agency is directed to specific projects. Often Congress will direct funding to projects not included in the Administration's request.

Table 4. Energy and Water Development Appropriations
Title I: Army Corps of Engineers
($ millions)

Program	FY2007	FY2008 Request	House[a]	Senate Comm.	Final
Investigations and Planning	$162.9	$90.0	$120.0	$172.1	$167.2
Construction	2,336.5	1,523.0	2,004.2	2,059.5	2,289.3
Mississippi River & Tributaries	396.6	260.0	278.0	375.0	2,243.6
Operation and Maintenance (O&M)	1,975.1	2,471.0	2,655.2	2,292.0	387.4
Regulatory	159.3	180.0	180.0	180.0	180.0
General Expenses	167.2	177.0	171.0	175.0	175.0
FUSRAP[b]	138.7	130.0	130.0	140.0	140.0
Flood Control and Coastal Emergencies	—	40.0	40.0	50.0	0.0
Office of the Asst. Secretary of the Army	4.0	—	6.0	4.5	4.5
Total Title I	**5,340.2**	**4,871.0**	**5,584.4**	**5,448.1**	**5,587.1**

Sources: FY2008 Budget Request; Army Corps of Engineers Civil Works: FY2007 Work Plan (March 19, 2007); H.Rept. 110-185; S.Rept. 110-127.

a. These figures account for rescissions.

b. "Formerly Utilized Sites Remedial Action Program."

Key Policy Issues—Corps of Engineers

Project Backlog and Agency Priorities

The policy debate on how to structure the Corps' budget and priorities is ongoing. The Corps civil works program has been criticized by some observers as an agglomeration of projects with no underlying design. These observers see the Corps' backlog of authorized activities as an example of this lack of focus. Prior to enactment of the $23 billion authorization bill for the agency known as the Water Resources Development Act (WRDA) in November 2007, estimates of the backlog's size had varied from $11 billion to more than $60 billion, depending on which projects are included. Although some observers view the backlog as nothing more than a Corps "to do" list, others are concerned that projects face construction delays and related cost overruns as available appropriations are spread across an increasing portfolio of projects.

The Corps' backlog of authorized projects and concerns about the fiscal planning and management of the agency's portfolio contribute to support for performance-based criteria for structuring the agency's budget and for concentrated appropriations on a small set of priority projects. Others also express concerns about the agency's fiscal planning and management, yet reject both the use of performance-based criteria that have been proposed and the focus on 6 to 10 priority projects. These critics argue that the criteria used are too simplistic and that basing the Corps' budget on performance criteria does not produce an integrated multiyear program for the agency. They also argue that the focus on priority projects has resulted in a disproportionate amount of the agency's budget being concentrated on a few projects, resulting in less investment in other authorized, cost-beneficial projects and in those regions of the country that do not have priority projects.

Performance-Based Budgeting

One way recent Administration requests have tried to address the backlog of Corps projects has been the application of a performance-based budgeting approach for determining which projects to include in its requests for construction and maintenance funds; the performance measures were based on their economic and environmental returns and protection of human safety. The construction projects selected for funding were chosen largely on their having either a high ratio of benefits to costs, or, for environmental projects, a high cost-effectiveness. The FY2008 budget request continued the Administration's movement toward presenting the agency's budget according to "business lines" (e.g., navigation, flood control, recreation, hydropower). For example, of the $4.871 billion budget request, $2.009 billion (41%) is for commercial navigation, $1.384 billion (28%) is for flood and coastal storm damage reduction, and $274 million (6%) and $110 million (2%) are for the agency's relatively new roles in aquatic ecosystem restoration and environmental stewardship, respectively. The agency's regulatory responsibilities represent $180 million, 4% of the agency's budget.

Although little of the debate about performance-based budgeting is reflected in the omnibus report language, the earlier House and Senate reports illustrated differing opinions about how best to manage the Corps' budget. H.Rept. 110-185 generally supported the Administration performance-based budgeting approach; it states: "While the Committee agrees in large part with the prioritization of projects, it does not believe the level of funding provided by the Administration is sufficient to meet the needs of the Nation." In contrast, the Senate Appropriations Committee report stated: "From the Committee's perspective, the Corps' budget seems to be developed exactly in the opposite manner that it should be." It then echoes the House by stating "the country needs to invest more heavily in its water resources." The Senate Appropriations Committee report criticized the Administration's focus on a small number of projects, and its lack of support for projects at the different stages of development (e.g., planning). It also questioned the effect that focusing on a few projects would have on the ability and interest in partnering with the Corps of the local project sponsors for the Corps' other authorized, but unbudgeted, projects and studies.

Priority Projects and New Starts

To address the backlog of authorized Corps activities, the Administration's request limited the number of new activities started to only two planning activities and one maintenance assessment. The President's request would fund construction projects that could be completed in FY2008 and six projects considered by the Administration to be priorities, similar to the President's FY2007, FY2006, and FY2005 requests.

Although little of the debate about new starts is reflected in the omnibus report language, the earlier House and Senate reports illustrated differing opinions about how best to manage the Corps' budget. H.Rept. 110-185 expressed general support for the Administration's no new start policy as applied to the FY2008 budget for the Corps. The exception noted by the Committee is that it "will consider funding for the major rehabilitation" at specific locks on the Ohio and Mississippi River systems because it "does not view the rehabilitation of existing infrastructure as a new construction start ... but rather a necessity." The Senate Appropriations Committee recommended a limited number of new construction starts. Numerous construction projects that were not included in the President's request were included among the projects funded in the omnibus report language.

Financial Management and O&M Budgeting

Unlike previous budget requests, the FY2007 and FY2008 requests did not specify the amount that individual Corps projects would receive for O&M. Instead, the Administration's recent requests divide the country into 21 regions and specify O&M funding for each region for six different categories of activities—commercial navigation, flood and coastal storm damage reduction, environment, hydropower, recreation, and water supply. The Corps has provided estimates of how much individual projects are expected to receive; however, these estimates are not part of the agency's formal budget request and budget justification package. This budgeting approach appears to allow the agency flexibility to move money across projects within the region as O&M needs arise, without being subject to many of the reprogramming restrictions put into place with the agency's FY2006 appropriations. Some project stakeholders are likely to be uncomfortable as a result of the decreased certainty in the O&M funding available for particular projects under this regional O&M budgeting approach.

Although little of the debate about new starts is reflected in the omnibus report language, the earlier House and Senate reports illustrated differing opinions about how best to manage the Corps' budget. H.Rept. 110-185 was critical of how the Administration developed its request for each of the 21 regions, and it adopts the regional approach to O&M funding by specifying an O&M funding level for each region. The Senate Appropriations Committee recommended rejecting the regional budgeting for O&M, arguing that this budgeting tactic serves no real purpose other than circumventing reprogramming guidance and that Corps projects (not regions) are authorized by Congress. The omnibus report language did not adopt the O&M regions. Instead it directed the Corps to prepare integrated O&M budgets for four regions—the Ohio River, the Great Lakes, the Texas coast, and the California coast.

The omnibus report language also provided direction to the Corps on reprogramming of funds, five-year budget plans, budget submission materials, and the use of multi-year continuing contracts.

Everglades

The Corps plays a significant coordination role in the restoration of the Central and Southern Florida ecosystem. The agency received $131 million for FY2008 Everglades restoration activities in the omnibus report language. The FY2008 budget request was for $162 million, down from the $164 million requested and provided for FY2007.

The FY2008 funds consist of Central and Southern Florida Project ($82 million, down from the $91 million requested), Kissimmee River Restoration Project ($31 million, down from the $33 million requested), Everglades and South Florida Restoration Projects ($8 million, up from the $4 million requested), and Modified Water Deliveries Project ($10 million, down from the $35

million requested). FY2006 was the first year that funds for the Mod Waters project were included in the Corps budget request and enacted appropriations; previously, the project was funded solely through Department of the Interior appropriations. The omnibus report language noted appropriators' concerns regarding the changing design of the Mod Waters project. The report directs the Corps to submit to the Appropriations Committees its plan for completion of Mod Waters, and it provides direction to Interior regarding its funding of the project. (For more information, see CRS Report RS21331, *Everglades Restoration: Modified Water Deliveries Project*, by Pervaze A. Sheikh.)

In addition to funding for Corps activities through Energy and Water Development appropriations, federal activities in the Everglades are funded through Department of the Interior appropriations bills. Concerns regarding the level of appropriations and progress in the restoration effort are discussed in CRS Report RS20702, *South Florida Ecosystem Restoration and the Comprehensive Everglades Restoration Plan*, by Pervaze A. Sheikh and Nicole T. Carter.

Hurricane Katrina Repairs and Coastal Louisiana Restoration

The Corps is responsible for much of the repair and fortification of the hurricane protection system of coastal Louisiana, particularly in the greater New Orleans area; to date, most of the Corps' work on the region's hurricane protection system has been funded through emergency supplemental appropriations, not through the annual appropriations process. The Corps has received more than $7 billion in emergency supplemental funds for flood protection and water resources repair and recovery work. The vast majority of the enacted and requested supplemental appropriations for the region are for structural hurricane defenses; coastal wetlands restoration activities by the Corps have received less than $200 million of the enacted Katrina appropriations. The 110th Congress enacted emergency supplemental legislation with an additional $1.64 billion for the Corps, largely to continue repairs and accelerate completion of flood and storm damage reduction projects in the New Orleans and south Louisiana area. Previously appropriated funds were insufficient to complete these activities because of increased costs, improved data on costs, and other factors.

Title II: Department of the Interior

The Department of the Interior requested that Congress provide an increase in funding for the Central Utah Project (CUP) Completion Account and a reduction for the Bureau of Reclamation (BOR) for FY2008. The total approved by P.L. 110-161 for Title II funding is $1.1509 billion—$149.5 million above the President's request.

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

Program	FY2007	FY2008 Request	House	Senate Comm.	P.L. 110-161
Central Utah Project Construction	$31.4	$40.4	$40.4	$40.4	$40.4
Mitigation and Conservation Activities	0.9	1.0	1.0	1.0	1.0
Oversight & Administration	1.7	1.6	1.6	1.6	1.6
Total, Central Utah Project	**34.0**	**43.0**	**43.0**	**43.0**	**43.0**

Source: Central Utah Project Completion Act, FY2008 Budget Justification. H.Rept. 110-185; S.Rept. 110-127., P.L. 110-161.

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

($ millions)

Program	FY2007	FY2008 Request	House	Senate Comm.	P.L. 110-161
Water and Related Resources	$874.7	$816.2	$871.2	$950.1	$949.9
Policy & Administration	57.3	58.8	58.8	58.8	58.8
CVP Restoration Fund (CVPRF)[a]	52.1	59.1	59.1	51.6	59.1
Legislative Proposal—SJRRF[b]	—	(7.5)	(7.5)	0.0	0.0
Calif. Bay-Delta (CALFED)	36.6	31.8	40.8	40.8	40.1
Gross Current Authority	**1,020.7**	**958.4**	**1,022.4**	**1,101.3**	**1,107.9**
CVP Collections[a]	(43.9)	(51.6)	(51.6)	(51.6)	(51.6)
Net Current Authority	**976.8**	**906.8**	**970.8**	**1,049.7**	**1,056.3**
Total, Title II	**1,054.7**	**1,001.4**	**1,065.4**	**1,144.3**	**1,150.9**

Source: Bureau of Reclamation FY2008 Budget Justification. H.Rept. 110-185; S.Rept. 110-127,P.L. 110-161.

a. In its request, BOR lists CVP Collections as an "offset." Congress does not follow this procedure.

b. FY2008 reflects a legislative proposal to redirect $7.5 million collected from Friant Division water users to the new San Joaquin River Restoration Fund.

Central Utah Project and Bureau of Reclamation: Budget In Brief

The Administration requested $43.0 million for the CUP Completion Account for FY2008 (**Table 5**). The FY2008 request for BOR totaled $958.4 million in gross current budget authority. This amount is $62.3 million less than enacted for FY2007. The FY2008 request included "offsets" of $51.6 million for the Central Valley Project (CVP) Restoration Fund, yielding a "net" current authority of $906.8 million for BOR. The total budget request for Title II funding, Central Utah Project and Bureau of Reclamation, was $1.0014 billion.

BOR's single largest account, Water and Related Resources, encompasses the agency's traditional programs and projects, including construction, operations and maintenance, the Dam Safety Program, Water and Energy Management Development, and Fish and Wildlife Management and Development, among others. The Administration requested $816.2 million for the Water and Related Resources Account for FY2008 (**Table 6**). This amount is $58.5 million (6.7%) less than enacted for FY2007.

The House Appropriations Committee recommended funding at the amount reflected in the President's Budget for CUP (**Table 5**), Policy and Administration, and the CVP (**Table 6**). The Committee recommended increases of $55 million for Water and Related Resources and $9 million for CALFED (**Table 6**). The Committee initially made no recommendations for specific water projects within Water and Related Resources, indicating that it would consider individual project allocations after further analysis. The Committee's final recommendation for Water and Related Resources matched the President's request for facilities and operations and maintenance (O&M). The additional funding recommended by the Committee was on the Resource Management side of the Water and Related Resources budget.

The Senate Appropriations Committee recommended funding at the amount reflected in the President's Budget for the CUP and Policy and Administration. Recommended funding for Water and Related Resources is $134 million more than the President's request and $79 million more than the level recommended by the House. The CALFED recommendation, an increase of $9 million over the President's request, matches the House. The Committee provided $7.5 million less funding for the CVP Restoration Fund, indicating that the Administration's proposed San Joaquin River Restoration Fund (which was included as an offset) was not yet authorized.

The House and Senate agreed on final appropriations for the BOR that were close to the levels recommended by one or both chambers previously. Policy and Administration remains unchanged from the President's request at $58.8 million. The CVP Restoration Fund remains at the level requested by the President, $59.1 million. However $7.5 million that the Administration and House intended for the proposed San Joaquin River Restoration Fund (SJRRF) was reallocated to other CVP Restoration Fund programs because the SJRRF was not authorized. Water and Related Resources and CALFED are both funded at levels similar to those passed by the Senate: $949.9 and $40.1 respectively. The total approved by P.L. 110-161 for Title II funding is $1.1509 billion—$149.5 million above the President's request.

Key Policy Issues—Bureau of Reclamation

Background

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

CALFED

The Administration requested $31.8 million for the California Bay-Delta Restoration Account (Bay-Delta, or CALFED) for FY2008 (**Table 6**). The bulk of the requested funds were targeted at three main program areas, including the environmental water account, the storage program, and conveyance. The remainder of the request was allocated for science, water quality, planning and management, and ecosystem restoration.

The House Appropriations Committee recommended that all programs within CALFED be funded at the level in the FY2008 budget request, except for a $1 million reduction in Planning and Management. The Committee also recommended $5 million each for Water Use Efficiency and Delta Levees, which were not in the President's Budget. The Committee indicated that funding for Delta Levees is to be transferred to the Corps of Engineers. The recommended $10 million addition and $1 million reduction result in a recommended net increase of $9 million over the President's request.

The Senate Appropriations Committee approved funding at the amount recommended by the House Appropriations Committee. The final appropriations level agreed to by both chambers is

$40.1 million for CALFED. (For more information on CALFED, see CRS Report RL31975, *CALFED Bay-Delta Program: Overview of Institutional and Water Use Issues*, by Pervaze A. Sheikh and Betsy A. Cody.)

Loan Guarantee Program

BOR requested $1 million in FY2008 to establish a loan guarantee program. Reclamation is establishing this program to guarantee private loans to water districts that have responsibility for funding O&M or rehabilitation costs on Reclamation facilities. Because the federal government retains title to these projects, it may be difficult for water users to secure loans from private lenders. The House and Senate Appropriations Committees recommended funding this program at the level requested.

Security

Under BOR's Water and Related Resources account, the Administration requested $35.5 million for site security for FY2008, a decrease of $4.1 million compared with that enacted for FY2007. The bulk of the request is for facility operations/security. Funding covers activities such as administration of the security program (e.g., surveillance and law enforcement), antiterrorism activities, and physical emergency security upgrades. (For more information, see CRS Report RL32189, *Terrorism and Security Issues Facing the Water Infrastructure Sector*, by Claudia Copeland.)

The FY2008 request assumed that annual costs for guard and patrol activities would be treated as project O&M costs, and hence would be reimbursable based on project cost allocations. These costs were estimated to be $18.9 million in FY2008, of which $11.6 million would be in up-front funding from power customers and $7.3 million would be appropriated funds which are reimbursed by irrigation, municipal, and industrial users and other customers. BOR would continue to treat facility fortification and antiterrorism management-related expenses as nonreimbursable.

The House and Senate Appropriations Committees both recommended funding this program at the level requested, and the final appropriation was $35.0 million.

Water 2025

This program, part of the Water and Related resources account, is intended to reduce water use conflicts by increasing certainty, diversity, and flexibility of water supplies. In 2008, BOR plans to focus program resources on areas where water conflicts exist currently or are likely to develop in the future. The 2008 budget request for this program is $11.0 million, a decrease of $3.5 million from FY2007. The House Appropriations Committee did not include funding for Water 2025, citing a lack of authorization for the program (however, see *General Provisions* below for Water 2025 authorization). The Senate Appropriations Committee recommended $14 million for Water 2025, indicating that funds above the President's $11 million request are intended to provide for efficiency and water improvements related to the Middle Rio Grande Conservancy District. Ultimately, $5.9 million was agreed upon by both chambers.

General Provisions

Final appropriations language includes a number of general provisions authorizing approximately $66 million in Nevada for water projects such as dam removal, fish passage, municipal water treatment, and watershed inventory (§208). Section 210 authorizes two water reuse projects: the

Inland Empire and Cucamonga Valley in California. A total of $30 million is authorized for these projects. An additional $20 million is authorized for the Southern California Desert Region Integrated Water and Economic Sustainability Program (§214).

Though no funding is specified, §204 authorizes the Secretary of the Interior, acting through the Commissioner of Reclamation, to fund grants at a 50% cost share aiding irrigation or water districts and states in their planning, design, and construction of projects to conserve water or improve water use efficiency. This language appears to authorize the BOR's Water 2025 program.

Title III: Department of Energy

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

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

Program	FY2007	FY2008 Request	House	Senate	Conf.
Energy Supply & Conservation					
Energy Efficiency & Renewables	$1,474.3	$1,236.2	$1,873.8	$1,715.6	$1,722.4
Electricity Delivery & Energy Reliability	137.0	114.9	134.2	169.4	138.6
Nuclear Energy	482.2	801.7	759.2	719.6	961.7
Environment, Safety, Health[a]	27.8	—	—	—	—
Legacy Management	33.2	35.1	—	35.1	33.9
Total, Energy Supply & Conservation	2,154.5	2,187.9	2,767.2	2,639.7	2,856.5
Fossil Energy R&D	592.6	566.8	708.8	808.1	742.8
Clean Coal Technology (Deferral)	—	(58.0)	(58.0)	(58.0)	(58.0)
Naval Petrol. & Oil Shale Reserves	21.3	17.3	17.3	21.3	20.3
Strategic Petroleum Reserve	164.4	331.6	163.5	163.5	186.8
Northeast Home Heating Oil Reserve	5.0	5.3	5.3	12.8	12.3
Energy Information Administration	90.7	105.1	105.1	105.1	95.5
Non-Defense Environmental Cleanup	349.7	180.9	286.0	195.4	182.3
Uranium Decontamination and Decommissioning Fund	556.6	573.5	618.8	573.5	622.2
Science[a]					
High Energy Physics	751.8	782.2	782.2	789.2	*688.0*
Nuclear Physics	422.8	471.3	471.3	471.3	*433.0*

Program	FY2007	FY2008 Request	House	Senate	Conf.
Basic Energy Sciences	1,250.3	1,498.5	1,498.5	1,512.3	*1,270.0*
Bio. & Env. R&D	483.5	531.9	581.9	605.8	*544.0*
Fusion	319.0	427.9	427.9	427.9	*287.0*
Advanced Scientific Computing	283.4	340.2	340.2	334.9	*351.0*
Other	292.2	351.5	417.7	361.5	*450.3*
Adjustments	(5.6)	(5.6)	(5.6)	(5.6)	(5.6)
Total, Science	3,797.3	4,397.9	4,514.1	4,497.3	4,017.7
Nuclear Waste Disposal	99.2	202.5	202.5	202.5	187.3
Environment, Safety, Health[b]	—	—	31.8	—	—
Departmental Admin. (net)	153.8	148.6	143.0	146.8	148.4
Office of Inspector General	41.8	48.4	47.7	47.7	46.1
Innovative Technology Loan Guarantee	—	8.4	—	8.4	4.5
National Nuclear Security Administration (NNSA)					
Weapons	6,275.6	6,511.3	5,879.1	6,489.0	6,297.5
Nuclear Nonproliferation	1,818.3	1,672.6	1,683.7	1,872.6	1,336.9
Naval Reactors	781.8	808.2	808.2	808.2	774.7
Office of Administrator	340.3	394.7	415.9	394.7	402.2
Total, NNSA	9,216.0	9,386.8	8,786.9	9,564.5	8,811.2
Defense Environmental Cleanup	5,731.8	5,363.9	5,766.6	5,690.4	5,349.4
Other Defense Activities	636.3	764.0	604.3	765.5	754.4
Defense Nuclear Waste Disposal	346.5	292.0	292.0	242.0	199.2
Total, Defense Activities	15,930.6	15,806.8	15,449.8	16,262.4	15,114.1
Power Marketing Administrations (PMA)					
Southeastern	5.6	6.5	6.5	6.5	6.4
Southwestern	30.0	30.4	30.4	30.4	30.2
Western	232.3	201.0	201.0	231.0	228.9
Falcon & Armistad O&M	2.7	2.5	2.5	2.5	2.5
Total, PMAs	270.6	240.4	240.4	270.4	267.9
FERC **(revenues)**	221.9 (221.9)	255.4 (255.4)	255.4 (255.4)	255.4 (255.4)	258.1 (258.1)
Total, Title III	**24,228.2**	**24,762.7**	**25,243.1**	**25,896.9**	**24,446.6**

Sources: DOE FY2008 Congressional Budget Request, February 2007; H.Rept. 110-185; S.Rept. 110-127. Consolidated Appropriations Act, 2008, P.L. 110-161.

a. Figures in italic for the Office of Science have been adjusted by CRS for the across-the board rescission (Sec. 312) but not for a specific rescission of $44.6 million in prior-year funds.

b. Environment, Safety and Health moved from Energy Supply and Conservation for FY2008.

The Administration's FY2008 request for DOE programs was $24.7627 billion, compared with $24.2282 billion appropriated for FY2007. The final omnibus act provides $24.4466 billion, $218 million above FY2007 but $316 million below the request. The FY2008 total reflects an across-the-board rescission on all DOE programs imposed by Section 312 of Title III, Division C of the act. Section 312 requires all funding levels in the explanatory statement to be reduced by 1.6% of earmarked funds and 0.91% for all other funding. Summary tables at the end of the explanatory statement reflect the Section 312 rescission, but the detailed tables do not. DOE is required to submit a report to the Appropriations Committees within 30 days with detailed numbers reflecting the rescission.

Key Policy Issues—Department of Energy

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

Energy Efficiency and Renewable Energy

The omnibus appropriations act provides $1,722.4 million for DOE's Office of Energy Efficiency and Renewable Energy (EERE) for FY2008, which is $486.2 million more than the request and $248.1 million more than the FY2007 appropriation. **Table 8** shows the FY2008 funding amounts by program. Relative to FY2007, the FY2008 appropriation provides key increases of $25.0 million for Vehicles, $22.7 for Weatherization, $17.5 million for Hydrogen, $14.8 million for Geothermal, $9.9 million for Water (Marine and Hydrokinetic) technologies, and $9.1 million for Solar. The FY2008 appropriation also includes $30.9 million less for Facilities. This reduction does not affect the level of funding for facilities operations; instead, it reflects a reduced level of spending on construction of new buildings. The main cuts in FY2008 are $9.5 million less for International Renewables (which terminates the program) and $5.4 million less for State Grants.

As **Table 8** shows, DOE's FY2008 request sought $1,236.2 million for the EERE programs. The Administration's Advanced Energy Initiative (AEI, part of the American Competitiveness Initiative) "aims to reduce America's dependence on imported energy sources." The AEI includes hydrogen, biofuels, and solar energy initiatives that are supported by programs in EERE. The Hydrogen Initiative aims to "facilitate a decision by industry to commercialize hydrogen infrastructure and fuel cell vehicles by 2015."[1]The Biofuels Initiative seeks to develop transportation fuels, such as cellulosic ethanol. The Solar America Initiative's goals are to cut the cost of photovoltaics (PV) technology, increase its commercial use, and displace natural gas use for electric power generation. The President's 2007 State of the Union address set out a goal to reduce gasoline use by 20% and to increase the production of "alternative" fuels, including cellulosic ethanol, to 35 billion gallons by 2017. To support the AEI and those fuels goals, the FY2008 EERE budget request proposed significant increases for the Biofuels, Hydrogen, and Solar programs.[2] At hearings on the FY2008 DOE budget request, concerns were raised about DOE's proposed termination of the Geothermal and Hydropower programs.[3] The House approved $1,873.8 million and the Senate Appropriations Committee approved $1,715.6 million for FY2008 EERE programs.

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

[2] The Energy Independence and Security Act (P.L. 110-140, H.R. 6) also addressed those goals.

[3] Secretary Bodman's Senate testimony is available at http://energy.senate.gov/public/_files/BodmanTestimony.pdf.

The House Committee report includes several policy directives to EERE. First, on page 59, it directs DOE to quantify and track the progress and impact of the investments in the EERE portfolio and brief the Committee annually on the return on investment for each of the accounts. Second, on page 60, the report directs DOE to implement an aggressive program that focuses on using Historically Black Colleges and Universities and Hispanic Serving Institutions to deepen the recruiting pool of diverse scientific and technical staff available to support the growing renewable energy marketplace. Third, on page 65, within funding available for the State Energy Program, the Committee directs DOE to implement section 140 of the Energy Policy Act of 2005 to support state-wide pilot programs that encourage reduced electricity and natural gas use.

The report of the Senate Appropriations Committee directs DOE to draw from available funds to study and report on five special topics. First, on page 131, DOE is directed to conduct a study on "the feasibility of increasing consumption of ethanol-blended gasoline with levels of ethanol blends between 10%-25%, including a study of production and infrastructure constraints on increasing consumption." Second, on page 131, the Committee requests that DOE prepare updates on the National Biofuels Action Plan and deliver the final plan by the end of January 2008. Third, on pages 131-132, the Committee recommends that DOE report on its planned procedure for holding a reverse auction for cellulosic biofuels grants, as directed by the Energy Policy Act of 2005 (§942). Fourth, on page 134, the Committee directs DOE to study methods of increasing the fuel efficiency of alternative fueled vehicles by improving their ability to use E-85 (85% ethanol) fuel. Fifth, on page 138, under the Electricity Program, the Committee encourages DOE to identify the potential for distributed energy equipment to provide energy savings and reduce transmission line losses. DOE is directed to focus the study on commercial potential.

Electricity Delivery and Energy Reliability

The FY2008 request included $114.9 million for the Office of Electricity Delivery and Energy Reliability (OE). The House approved $134.2 million and the Senate Appropriations Committee approved $169.4 million. The omnibus law provides $138.7 million. The Senate Committee report directs OE to increase energy storage efforts in support of intermittent wind and solar power production and to increase support for deployment of distributed generation equipment.

Table 8. Energy Efficiency and Renewable Energy Programs

($ millions)

Program	FY2006	FY2007	FY2008 Request	FY2008 House	FY2008 SAppC	FY2008 Conf.
Hydrogen Technologies	$153.5	$193.6	$213.0	$194.6	228.0	211.1
Biomass & Biorefinery Systems	89.8	199.7	179.3	250.0	244.0	198.2
Solar Energy	81.8	159.4	148.3	200.0	180.0	168.5
—Photovoltaics	58.8	—	137.3	149.0	145.3	136.7
Wind Energy	38.3	49.3	40.1	57.5	57.5	49.5
Geothermal Technology	22.8	5.0	0.0	44.3	25.0	19.8
Water Power (Hydro/Ocean)	0.5	0.0	0.0	22.0	10.0	9.9
Subtotal, Renew. & Hydrogen	386.6	606.9	580.6	768.4	744.5	657.0
Vehicle Technologies	178.4	188.0	176.1	235.4	230.0	213.0
Building Technologies	68.2	104.3	86.5	146.5	137.0	109.0
Industrial Technologies	55.9	56.6	46.0	57.0	57.0	64.4

Program	FY2006	FY2007	FY2008 Request	FY2008 House	FY2008 SAppC	FY2008 Conf.
Federal Energy Management	19.0	19.5	16.8	27.0	23.0	19.8
Subtotal, Efficiency R&D	321.4	368.4	325.4	465.9	447.0	406.2
Facilities & Infrastructure	26.1	107.0	7.0	195.7	7.0	76.2
Program Management	115.2	110.2	118.3	128.9	118.3	114.9
R&D Subtotal	849.2	1,192.6	1,031.3	1,558.9	1,316.8	1,254.3
Federal Assistance						
—Weatherization Grants	242.6	204.6	144.0	245.6	240.6	227.2
—State Energy Grants	36.1	58.8	45.5	49.5	55.0	44.1
—Renewables Deployment	38.2	18.4	15.4	19.9	12.0	10.9
—Cong.-Directed Assistance[a]	—	0.0	0.0	—	91.2	185.9
Federal Assistance Subtotal	316.9	281.7	204.9	314.9	398.8	468.1
Total Appropriation, EE & RE	1,166.1	1,474.3	1,236.2	1,873.8	1,715.6	1,722.4
Office of Electricity Delivery & Energy Reliability (OE)[b]	158.2	137.0	114.9	134.2	169.4	138.7

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

a. In FY2006, there was $159.0 million in congressionally-directed funds spread over EERE accounts. For FY2008, the House approved (H.Rept. 110-185, part 2) $104.3 million for congressionally-directed assistance to be taken from available funds.

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

Nuclear Energy

For nuclear energy research and development—including advanced reactors, fuel cycle technology, nuclear hydrogen production, and infrastructure support—DOE received $1.037 billion for FY2008. That amount is substantially higher than the FY2007 funding level and the Administration's request, but it includes large transfers from other accounts and eliminates most of the Administration's proposed increase for the Advanced Fuel Cycle Initiative (AFCI). The higher AFCI funding would have allowed DOE to continue developing a demonstration plant for extracting plutonium and uranium from spent nuclear fuel, as part of the Administration's Global Nuclear Energy Partnership (GNEP). The nuclear energy program is run by DOE's Office of Nuclear Energy, Science, and Technology.

DOE requested $801.7 million for FY2008, nearly 30% above the FY2007 funding level. The request would have boosted funding for AFCI from $167.5 million in FY2007 to $395.0 million in FY2008. The omnibus appropriation holds AFCI to $181 million and shifts the mixed-oxide (MOX) fuel program—totaling $281 million—to the nuclear energy program from the nuclear nonproliferation program. That brings the nuclear energy total to $970.5 million ($961.7 million with the rescission), about 20% above the request. An additional $75.9 million provided in the Other Defense Activities account brings the Office of Nuclear Energy's total spending level to $1.046 billion ($1.037 billion with the rescission).

Overall, the House had provided a funding level of $835.2 million for nuclear energy, including $74.9 million from the Other Defense Activities account and $167.8 million transferred for the MOX program. The Senate Appropriations Committee had recommended $795.5 million for

nuclear energy, including $75.9 million from Other Defense Activities, while opposing the MOX funding transfer.

According to DOE's FY2008 budget justification, the nuclear energy R&D program is intended "to secure nuclear energy as a viable, long-term commercial energy option, providing diversity in the energy supply." 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.

Under the Administration's GNEP initiative, plutonium partially separated from the highly radioactive spent fuel from nuclear reactors would be recycled into new fuel to expand the future supply of nuclear fuel and potentially reduce the amount of radioactive waste to be disposed of in a permanent repository. Under the initial concept for GNEP, the United States and other advanced nuclear nations would lease new fuel to other nations that agreed to forgo uranium enrichment, spent fuel recycling (also called reprocessing), and other fuel cycle facilities that could be used to produce nuclear weapons materials. The leased fuel would then be returned to supplier nations for reprocessing. Solidified high-level reprocessing waste would be sent back to the nation that had used the leased fuel, along with supplies of fresh nuclear fuel. However, a GNEP Statement of Principles signed by the United States and 15 other countries on September 16, 2007, preserves the right of all participants to develop fuel cycle facilities while encouraging the establishment of a "viable alternative to acquisition of sensitive fuel cycle technologies."[4]

Although GNEP is largely conceptual at this point, DOE issued a Spent Nuclear Fuel Recycling Program Plan in May 2006 that provided a general schedule for a GNEP Technology Demonstration Program (TDP),[5] which would develop the necessary technologies to achieve GNEP's goals. According to the Program Plan, the first phase of the TDP, running through FY2006, consisted of "program definition and development" and acceleration of AFCI. Phase 2, running through FY2008, was to focus on the design of technology demonstration facilities, which then were to begin operating during Phase 3, from FY2008 to FY2020. The National Academy of Sciences in October 2007 strongly criticized DOE's "aggressive" deployment schedule for GNEP and recommended that the program instead focus on research and development.[6]

Nuclear critics oppose GNEP's emphasis on spent fuel reprocessing, which they see as a weapons proliferation risk, even if weapons-useable plutonium is not completely separated from other spent fuel elements, as envisioned by the Administration. "As the research of DOE scientists makes clear, the reprocessing technologies under consideration would still produce a material that is not radioactive enough to deter theft, and that could be used to make nuclear weapons," according to the Union of Concerned Scientists.[7]

The omnibus appropriation cuts the Administration's GNEP request to $181 million, including $30 million for upgrades to existing facilities. The remaining $151 million is for research, development, and design activities, with no funds for constructing facilities for technology demonstration or commercialization. The GNEP budget totals, as well as the remaining nuclear program numbers cited below, do not reflect the 0.91% across-the-board DOE rescission.

---

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

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

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

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

Nuclear Power 2010

President Bush's specific mention of "clean, safe nuclear power" in his 2007 State of the Union address reiterated the Administration's interest in encouraging construction of new commercial reactors—for which there have been no U.S. orders since 1978. DOE's efforts to restart the nuclear construction pipeline have been focused on the Nuclear Power 2010 Program, which will pay up to half of the nuclear industry's costs of seeking regulatory approval for new reactor sites, applying for new reactor licenses, and preparing detailed plant designs. The Nuclear Power 2010 Program, which includes the Standby Support Program authorized by the Energy Policy Act of 2005 (P.L. 109-58) to pay for regulatory delays, is intended to encourage near-term orders for advanced versions of existing commercial nuclear plants.

Two industry consortia are receiving DOE assistance over the next several years to design and license new nuclear power plants. DOE awarded the first funding to the consortia in 2004. DOE requested $114.0 million for Nuclear Power 2010 for FY2008, more than 40% above the FY2007 funding level of $80.3 million. The omnibus act provided a $21.0 million increase from the budget request, as recommended by the Senate Appropriations Committee, for a total of $135.0 million. The funding increase is intended to accelerate progress on the new reactor licenses. The House had approved flat funding for the program, contending that funds should not be provided for reactor design work.

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

- A consortium led by Dominion Resources that is preparing a COL for an advanced General Electric reactor. The proposed reactor would be located at Dominion's existing North Anna plant in Virginia, where the company received an NRC early-site permit with DOE assistance. Dominion Energy submitted a COL application for a new unit at North Anna on November 27, 2007.
- A consortium called NuStart Energy Development, including Exelon and several other major nuclear utilities, which announced on September 22, 2005, that it would seek a COL for two Westinghouse reactors at the site of TVA's uncompleted Bellefonte nuclear plant in Alabama and for a General Electric design at the Grand Gulf plant in Mississippi. The Nuclear Power 2010 Program is providing funding for review and approval of the Bellefonte COL, which was submitted to NRC on October 30, 2007.

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

Generation IV

Advanced commercial reactor technologies that are not yet close to deployment are the focus of DOE's Generation IV Nuclear Energy Systems Initiative, for which $36.1 million was requested for FY2008—about the same as the FY2007 funding level. The omnibus measure nearly tripled the request to $116.0 million, with $74 million devoted to the Next Generation Nuclear Plant (NGNP). At least $38 million of the NGNP funding is to be spent for developing a conceptual design and baseline cost estimate, and $36 million is for NRC pre-licensing activities. Under DOE's current plans, NGNP will use Very High Temperature Reactor (VHTR) technology, which features helium as a coolant and coated-particle fuel that can withstand temperatures up to 1,600 degrees Celsius.

The Energy Policy Act of 2005 authorizes $1.25 billion through FY2015 for NGNP development and construction (Title VI, Subtitle C). The authorization requires that NGNP be based on research conducted by the Generation IV program and be capable of producing electricity, hydrogen, or both. Phase I research on the NGNP is to continue until 2011, when a decision will be made on moving to the Phase II design and construction stage, according to the FY2008 DOE budget justification.

In conjunction with the GNEP Technology Demonstration Program, the Generation IV Program will also focus on developing a sodium-cooled fast reactor (SFR). Existing U.S. commercial nuclear reactors use water to slow down, or "moderate," the neutrons released by the fission process (splitting of nuclei). The relatively slow (thermal) neutrons are highly efficient in causing fission in certain isotopes of heavy elements, such as uranium 235 and plutonium 239.[8] Therefore, fewer of those isotopes are needed in nuclear fuel to sustain a nuclear chain reaction (in which neutrons released by fissioned nuclei then induce fission in other nuclei, and so forth). The downside is that thermal neutrons cannot efficiently induce fission in more than a few specific isotopes.

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

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

"Given the benefits of continuous recycling, at this time GNEP-TDP is focused on the development of fast reactor technologies, recognizing that fast reactor operating experience is much more limited than thermal reactor operating experience, and that fast burn reactor fuels, or transmutation fuels, are not fully developed," according to the DOE Program Plan.[9]

The House Appropriations Committee report directed DOE to make the gas-cooled NGNP a higher priority than fast reactors for GNEP and begin a competitive solicitation for a commercial demonstration plant at the Idaho National Laboratory. The Senate panel also emphasized gas-cooled reactors in the Generation IV program.

---

[8] Isotopes are atoms of the same chemical element but with different numbers of neutrons in their nuclei.

[9] *Spent Nuclear Fuel Recycling Program Plan*, p. 8.

The Generation IV program is also monitoring international research on lead-cooled fast reactors, gas-cooled fast reactors, and supercritical water-cooled reactors, according to the FY2008 budget justification.

Fuel Cycle Research and Facilities

The omnibus act places the Advanced Fuel Cycle Initiative within the new category of Fuel Cycle Research and Facilities, along with Mixed-Oxide Fuel Fabrication, which was transferred from the nuclear nonproliferation account (described in a separate section of this report). Funding for the new category totals $462.3 million.

The FY2008 funding request of $395 million for AFCI, the primary component of GNEP, was more than double the FY2007 funding level of $167.5 million, which in turn was more than double the FY2006 appropriation. The omnibus act reduced AFCI to $181.0 million, as discussed above. According to the DOE budget justification, AFCI will develop and demonstrate nuclear fuel cycles that could reduce the long-term hazard of spent nuclear fuel and recover additional energy. Such technologies would involve separation of plutonium, uranium, and other long-lived radioactive materials from spent fuel for reuse in a nuclear reactor or for transmutation in a particle accelerator. Much of the program's research will focus on a separations technology called UREX+, in which uranium and other elements are chemically removed from dissolved spent fuel, leaving a mixture of plutonium and other highly radioactive elements. Proponents believe the process is proliferation-resistant, because further purification would be required to make the plutonium useable for weapons and because its high radioactivity would make it difficult to divert or work with.

FY2008 funding was also to have been used for conceptual design work on an Advanced Fuel Cycle Facility (AFCF) to provide an engineering-scale demonstration of AFCI technologies, according to the budget justification. At the same time, industry design teams were to complete conceptual designs for nuclear fuel recycling demonstration facilities to be used for GNEP. However, the omnibus measure specifically rejected funding for development of AFCF in FY2008.

Removing uranium from spent fuel would eliminate most of the volume of spent nuclear fuel that would otherwise require disposal in a deep geologic repository, which DOE is developing at Yucca Mountain, Nevada. The UREX+ process also could reduce the heat generated by nuclear waste—the major limit on the repository's capacity—by removing cesium and strontium for separate storage and decay over several hundred years. Plutonium and other long-lived elements would be fissioned in accelerators or fast reactors (such as the type under development by the Generation IV program) to reduce the long-term hazard of nuclear waste. Even if technically feasible, however, the economic viability of such waste processing has yet to be determined, and it still faces significant opposition on nuclear nonproliferation grounds.

Nuclear Hydrogen Initiative

In support of President Bush's program to develop hydrogen-fueled vehicles, DOE is requesting $22.6 million in FY2008 for the Nuclear Hydrogen Initiative, about 10% above the FY2007 funding level but below the FY2006 appropriation. The omnibus measure provides $10 million for the program. The House had provided flat funding for the program, and the Senate Committee had approved the full request. According to DOE's FY2008 budget justification, the program will continue laboratory-scale experiments to allow selection by 2011 of a hydrogen-production technology for pilot-scale demonstration by 2013.

Fossil Energy Research, Development, and Demonstration

The Bush Administration requested $566.8 million in the FY2008 omnibus act for Fossil Energy Research and Development (see **Table 9**). This is about 20.7% more than the $469.7 million requested in FY2007. (Final funding under the FY2007 Operating Plan showed spending of $592.6 million). Major funding categories and amounts in the FY2008 request include the President's Coal Research Initiative (Clean Coal Power Initiative, $73 million; FutureGen, $108 million; and Fuels and Power Systems, $245.6 million), Program Direction ($130 million), Fossil Energy Environmental Restoration ($9.6 million), and Special Recruitment Programs ($0.7 million). Coal and coal-related activities accounted for more than 75% of the FY2008 Fossil Energy R&D budget request.

The FY2007 funding bill (P.L. 110-5) as enacted deferred $257million in unobligated Clean Coal Technology balances to FY2008. The FY2008 omnibus act transfers $166 million to the Fossil Energy Research and Development account in FY2008, and recommends the deferral of $149 million in Clean Coal Technology balances until FY2009 (as proposed by the Senate and not the rescission of balances proposed by the House). The FY2008 act provides $750 million for Fossil Energy Research and Development (an across-the-board rescission of 0.91% reduces this to $742.8 million). Under that heading, $70 million is marked for the Clean Coal Power Initiative ($3 million below request); $75 million for FutureGen ($33 million below request due to unused prior-year funds); $352.9 million for Fuels and Power Systems ($107.3 million above request); $20 million for Natural Gas Technologies; $5 million for Petroleum-Oil Technologies; $150 million for Program Direction; $13 million for Plant and Capital Equipment; $0.7 million for Special Recruitment Programs; $5 million for Cooperative Research and Development; and $48.9 million for congressionally directed projects.

Table 9. Fossil Energy Research and Development Programs

($ millions)

Clean Coal Technology	FY2007 Op. Plan	FY2008 Request	FY2008 House	FY2008 S.Cmte.	FY2008 Appropriations
Def. unobligated bal., FY2007	257.0				
Def. unobligated bal., FY2008	-257.0	257.0	257.0	257.0	257.0
Def. unobligated bal., FY2009					-149.0
Rescission, uncommitted bal.	—	-149.0	-149.0	-149.0	
Transfer to Clean Coal Pwr. Init.	—	-58.0	—	-73.0	-70.0
Transfer to FutureGen	—	-108.0	-108.0	-88.0	-75.0
Transfer to Fuels & Power Sys.			-58.0		-21.0
Transfer to Fossil Energy R&D				-5.0	
Transfer to Carbon Sequestration			-58.0		
Total	—	-58.0	-58.0	-58.0	-58.0
Fossil Energy R & D	**FY2007 Op. Plan**	**FY2008 Request**	**FY2008 House**	**FY2008 S.Cmte.**	**FY2008 Appropriations**
Clean Coal Power Initiative	60.4	73.0	73.0	88.0	70.0
FutureGen	54.0	108.0	108.0	88.0	75.0

Fuels & Power Systems					
Innovations for existing plants				36.4	
Advanced IGCC				54.0	
Advanced turbines				24.0	
Carbon sequestration				120.0	
Fuels				25.0	
Fuel Cell				56.0	
Advanced research				37.5	
Subtotal	311.3	245.6	375.6	374.0	352.9
Natural Gas Technologies	12.0	—	12.0	20.0	20.0
Petroleum-Oil Technologies	2.7	—	2.7	10.0	5.0
Program Direction	129.8	130.0	127.0	150.0	150.0
Plant & Capital Equipment		—			13.0
Fossil Energy Env. Restoration	9.7	9.6	9.6	16.6	9.6
Special Recruitment Program		0.7			0.7
Congressionally Directed					48.0
Other	12.7	0.7	07	61.6	
Total	592.6	566.8	708.8	808.1	750.0[a]

Sources: DOE FY2007 Operating Plan; DOE FY2008 Budget Request; H.Rept. 110-185; S.Rept. 110-127; Congressional Record, December 17, 2007.

a. does not reflect a 0.91% across-the-board rescission.

The Clean Coal Power Initiative is intended to demonstrate advanced clean coal-based power generation technologies on a commercial scale capable of achieving 45% thermal efficiency. The FutureGen project will partner with industry to build the advanced coal-based Integrated Gasification Combined Cycle (IGCC) plant that can produce electricity at 45%-50% efficiency at a capital cost of $1,000/kilowatt (in 2003 dollars) and can integrate CO_2 separation, capture, and sequestration. The FutureGen Industrial Alliance, Inc., has selected Mattoon, Illinois, as the plant site. The Fuels program is a key component of the Hydrogen Fuel Initiative and will provide the hydrogen production supporting R&D for the FutureGen project. The Fossil Energy Environmental Restoration program remediates the National Energy Technology Laboratory at the Morgantown, WV; Pittsburgh, PA; Tulsa, OK; Fairbanks, AK; and Albany, OR, sites.

The Energy Policy Act of 2005 (P.L. 109-58, Title IV) authorizes the annual appropriation of $200 million in FY2006 through FY2014 for the Clean Coal Power Initiative (see **Table 10**). Of the funds made available, 70% (i.e., $140 million annually) are to be used only in funding coal-based gasification technologies: combined cycle, fuel cell, coproduction, hybrid, and advanced technologies capable of producing concentrated carbon monoxide—technologies aimed at FutureGen. The Coal and Related Technologies Program is authorized $611 million in FY2007, $626 million in FY2008, and $641 million in FY2009, in addition to programs for research, development, demonstration, and commercial application of coal-based power generation through gasification, advanced combustion, and turbines for synthesis gas derived from coal.

Table 10. Energy Policy Act of 2005 Title IV Authorization

($ millions)

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

Source: DOE FY2008 Budget Request.

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

Strategic Petroleum Reserve

The Strategic Petroleum Reserve (SPR), authorized by the Energy Policy and Conservation Act (P.L. 94-163) in 1975, consists of caverns formed out of naturally occurring salt domes in Louisiana and Texas in which roughly 690 million barrels of crude oil are stored. Current capacity is 727 million barrels; the SPR currently holds 690 million barrels. The purpose of the SPR is to provide an emergency source of crude oil that may be tapped in the event of a presidential finding that an interruption in oil supply, or an interruption threatening adverse economic effects, warrants a drawdown from the reserve. A Northeast Heating Oil Reserve (NHOR) was established during the Clinton Administration. NHOR houses 2 million barrels of home heating oil in above-ground facilities in Connecticut, New Jersey, and Rhode Island.

Program costs for the SPR in recent years have been dedicated principally to maintaining SPR facilities and keeping the SPR in readiness should it be needed. Any fill activity was accomplished by accepting deliveries of royalty-in-kind (RIK) oil to the SPR in lieu of cash royalties on offshore production being paid to the federal government. The Administration request for FY2007 for the SPR was $155.4 million. DOE's 2007 operating plan set FY2007 spending at $169.4 million, including $5.0 million for the NHOR. The FY2008 request for the same activities was $168.8 million. However, the request included an additional $168.1 million to launch the Administration's plan to expand the SPR to 1.5 billion barrels, for a total of $331.6 million. At present, expansion of the Reserve is authorized to 1 billion barrels by the Energy Policy Act of 2005 (P.L. 109-58). The FY2008 request from the Administration was intended to achieve capacity of 1 billion barrels by adding 115 million barrels of capacity at three existing sites and establishing a new site, in Richton, Mississippi, where 160 million barrels of capacity would be created. The FY2008 budget request indicated that the Administration would seek authority at a later date to expand the SPR to 1.5 billion barrels, and that planned spending during FY2008 would be a start toward that goal.

The proposal to raise spending significantly to expand the SPR was anticipated to be controversial. In its report on the bill (H.Rept. 110-185), the House Committee on Appropriations indicated that it did not support expansion of the SPR at this time, noting an estimate that it would cost $10 billion for creating additional capacity and $55 billion to fill, and expansion would not be completed until 2027. The Committee said the plans for the expansion lacked "analytical clarity," citing recommendations in a 2006 report from the Government Accountability Office (GAO) that a new assessment be made of the optimal mix for the SPR of sweet and sour crudes,

as well as the appropriate size of the SPR. The Committee recommended $163.5 million for the SPR program in FY2008, and approved the Administration request of $5.3 million for the NHOR.

The Senate Committee on Appropriations had the same reaction as the House committee. Citing the same statistics as in the House report, the Senate committee also settled on a recommendation of $163.5 million. The omnibus bill provides $188.5 million, an increase of $25 million, which is directed to be spent to acquire land at a new site. The explanatory statement on the bill is explicit that the Appropriations Committees do not support expansion of the SPR to 1.5 billion barrels.

Meanwhile, fill of the SPR with royalty-in-kind (RIK) oil continues to be controversial. Critics argue that it is inadvisable to add oil to the SPR when markets are tight and prices are touching inflation-adjusted historic highs, and that the additional oil adds little to U.S. energy security. Supporters of RIK fill argue that the fill rate is too little to have a discernible impact on markets, and that currently high product prices are sustained owing to factors other than crude supply, which is more than ample at this time. Deliveries of RIK oil to the SPR totaled 4.3 million barrels during FY2007. Deliveries of RIK oil during FY2008 are estimated at 19.1 million barrels. Deliveries of roughly 15 million barrels are scheduled through July 2008.

Science

The DOE Office of Science conducts basic research in six program areas: basic energy sciences, high-energy physics, biological and environmental research, nuclear physics, fusion energy sciences, and advanced scientific computing research. Through these programs, DOE is the third-largest federal funder of basic research and the largest federal funder of research in the physical sciences.[10] For FY2008, DOE requested $4.398 billion for Science, an increase of 16% from the FY2007 amount of $3.797 billion. This unusually large increase reflected the American Competitiveness Initiative (ACI), which President Bush announced in his State of the Union address on January 31, 2006. Over 10 years, the ACI would double the combined R&D funding of the DOE Office of Science and two other agencies. The House provided $4.514 billion for Science. The Senate committee recommended $4.497 billion. The final appropriation was $4.018 billion,[11] which was $380 million less than the request but a 6% increase from FY2007.

The requested funding for the largest Office of Science program, basic energy sciences, was $1.498 billion, a 20% increase from FY2007. Much of the requested increase was to expand facility operating time, as called for by the House and Senate appropriations reports for FY2006. The House provided the requested amount, and the Senate committee recommended a further increase of $14 million. The final appropriation was $1.270 billion, less than the request by $229 million but a 2% increase from FY2007. The explanatory statement did not explain how this reduction relative to the request should be allocated to particular activities. In particular, it did not mention the operating time issue. It did state that the final bill included "less funding than requested for two projects where the start of major construction activity can be delayed," but the total request for construction in this program was only $121 million.

For high-energy physics, the request was $782 million, up 4% from FY2007. The budget justification stated that the program's "highest priority R&D effort is the development of the proposed International Linear Collider (ILC)." The House provided the requested amount, including the requested increase for the ILC. The House committee also emphasized its support for the NASA/DOE Joint Dark Energy Mission (JDEM), for which it said "DOE has done its

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

[11] Adjusted for the across-the board rescission (Sec. 312) but not for a specific rescission of $44.6 million in prior-year funds.

part" but "NASA has failed to budget and program for launch services." The Senate committee also recommended the requested ILC funding, although as in previous years it expressed concern that the ILC "will crowd out other valuable research"; it provided a $7 million increase to "aggressively ramp up" JDEM and related activities. The final appropriation was $688 million, $94 million less than the request and 8% down from FY2007. The final bill provided $15 million for the ILC, $45 million less than the request; the explanatory statement directed DOE to proceed with JDEM during FY2008, together with NASA, but if the two agencies cannot agree on a joint approach, to provide no support for space science satellite missions in future years. The Fermi National Accelerator Laboratory (Fermilab) received about $52 million less than requested, and the Stanford Linear Accelerator Center (SLAC) received about $25 million less. The directors of Fermilab and SLAC have announced plans to lay off 200 and 125 employees respectively.[12]

The request for biological and environmental research was $532 million, up 10%. The House provided an increase of $30 million for biological research and an increase of $20 million for climate change research. The Senate committee recommended an increase of $73 million, mostly for congressionally directed projects. The final appropriation was $544 million, an increase of $12 million. In past years, biological and environmental research has been the main location for congressionally directed projects in the Science account. The explanatory statement for FY2008 grouped all such projects (for the entire Office of Science) in a separate category, for which it provided $124 million.

For nuclear physics, the request was $471 million, up 11% from FY2007. As in the FY2007 request, no funds were included for construction of the Rare Isotope Accelerator (RIA), despite direction in Section 981 of the Energy Policy Act of 2005 (P.L. 109-58) that construction of this project must begin no later than the end of FY2008. A National Academies report on the RIA was released in December 2006 and is available on the nuclear physics program's website.[13] The House provided the requested amount and endorsed DOE's decision to fund additional R&D rather than build the RIA. The Senate committee recommended the requested amount and did not mention the RIA. The final appropriation was $433 million, less than the request by $39 million but 2% up from FY2007.

The request for fusion energy sciences was $428 million, up 34%. Almost the entire increase was for the U.S. share of the International Thermonuclear Experimental Reactor (ITER), a fusion facility now under construction whose other participants include China, the European Union, India, Japan, Russia, and South Korea. The House provided the requested amount, but rejected the proposed creation of a new activity in high energy-density physics and instead redistributed its requested $12 million among existing non-ITER activities. The Senate committee also recommended the requested amount, but it supported the new program in high energy-density physics and encouraged DOE to expand it in future years. The final appropriation was $287 million, less than the request by $141 million and 10% down from FY2007. The requested $150 million for U.S. contributions to ITER was not included, although $10 million for related R&D was, and DOE was directed not to use reprogramming to restore ITER funding. According to press reports, ITER officials expect no immediate impact on the project's planned start in 2008, but "what the other ITER partners now want from the United States is clarity" about its future

[12] Pier J. Oddone, director of Fermilab, presentation slides from an "all hands" meeting on December 20, 2007, http://www.fnal.gov/pub/today/files/All_Hands_Meeting_122007.ppt; Persis S. Drell, director of SLAC, presentation slides from an "all hands" meeting on January 7, 2008, http://today.slac.stanford.edu/misc/AllHands-010708.ppt.

[13] National Research Council, *Scientific Opportunities with a Rare-Isotope Facility in the United States*, online at http://www.sc.doe.gov/np/program/docs/RareIsotopeScienceAssessment.pdf.

plans.[14] Under an agreement signed in 2006, the U.S. share of ITER construction costs is 9.1%, or an estimated $1.122 billion through FY2014.

The request for the smallest of the Office of Science research programs, advanced scientific computing research, was $340 million, up 20% from FY2007. The House provided the requested amount. The Senate committee recommended $335 million. The final appropriation was $351 million.

The request for laboratory infrastructure was $79 million, up from $42 million in FY2007. The House provided $152 million: the bulk of this increase was to accelerate facility cleanup, replacement, renovation, and upgrades at Pacific Northwest National Laboratory (PNNL). The Senate committee recommended $89 million, expressed its continued support for the affected PNNL facilities, and questioned why the budget request did not fund an agreement on those facilities signed by DOE and the Department of Homeland Security in 2006. The final appropriation was $65 million. It included $10 million less than the request for PNNL, but the explanatory statement directed DOE to increase future funding for PNNL by $10 million to restore the baseline.

Nuclear Waste Disposal

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

The omnibus appropriations act provides $386.5 million in FY2008 for the nuclear waste program (including the rescission), about $50 million below the FY2007 level and more than $100 million below the Administration's $494.5 million request. The funding cut may affect OCRWM's plans to submit the Yucca Mountain license application to the Nuclear Regulatory Commission by June 30, 2008, and the current goal of opening the repository by 2017. The House had approved the full request, while the Senate Appropriations panel had voted to hold the program at $446.1 million, about the FY2007 level.

Funding for the program is provided under two appropriations accounts. The Administration requested $202.5 million from the Nuclear Waste Fund, which holds fees paid by nuclear utilities. An additional $292.0 million was requested in the Defense Nuclear Waste Disposal account, which pays for disposal of high-level waste from the nuclear weapons program in the planned Yucca Mountain repository. The omnibus measure provides $187.3 million from the Nuclear Waste Fund and $199.2 million under the Defense Nuclear Waste Disposal account (with both figures reflecting the rescission).

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

NWPA required DOE to begin taking waste from nuclear plant sites by January 31, 1998. Nuclear utilities, upset over DOE's failure to meet that deadline, have won two federal court decisions upholding the department's obligation to meet the deadline and to compensate utilities for any resulting damages. Utilities have also won several cases in the U.S. Court of Federal Claims.

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

DOE estimates that liability payments will total $7 billion if Yucca Mountain begins receiving waste by 2017 and $11 billion if the repository's opening is delayed until 2020.[15] (For more information, see CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by Mark Holt.)

Loan Guarantees

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

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

In the FY2008 request, the Administration sought $9 billion in loan guarantee authority (including $2 billion previously requested for FY2007). The House approved $7 billion in loan guarantees for FY2008, allocating $2 billion for coal, $4 billion for biofuels, and $1 billion for electric transmission and renewable power systems, specifically omitting the Administration's mention of nuclear power. The Senate Appropriations Committee's version of the bill did not cap the loan guarantee level or specify eligible technologies.

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. The three main elements of stockpile stewardship, described below, are Directed Stockpile Work (DSW), Campaigns, and Readiness in Technical Base and Facilities (RTBF). **Table 11** presents funding for these elements. 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.

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

Table 11. Funding for Weapons Activities

($ millions)

Program	FY2007 Operating Plan	FY2008 Request	House	Senate Approps. Cmte.	Consolidated Approps. Act
DSW	$1,425.7	$1,447.2	$1,336.6	$1,409.5	$1,413.9
Campaigns	1,979.0	1,866.2	1,725.2	1,933.2	1,890.7
RTBF	1,613.2	1,662.1	1,479.6	1,659.2	1,652.1
Other[a]	1,257.7	1,535.7	1,337.7	1,487.1	1,398.9
Total	**6,275.6**	**6,511.3**	**5,879.1**	**6,489.0**	**6,355.6**

Sources: DOE FY2008 Congressional Budget Request, vol. 1 (NNSA), p. 59; U.S. Department of Energy, *FY 2007 Operating Plan by Appropriation*, March 16, 2007, pp. 15-21; U.S. Congress. House. Committee on Appropriations. *Energy and Water Development Appropriations Bill*, 2008, 110th Congress, 1st Session, H.Rept. 110-185, pp. 136-140; U.S. Congress. Senate. Committee on Appropriations. Energy and Water Appropriations Bill, 2008, 110th Congress, 1st Session, S.Rept. 110-127, pp. 193-198; and U.S. Congress. House. Committee on Rules. *Text of the House Amendments to Senate Amendment to H.R. 2764—State, Foreign Operations, and Related Programs Appropriations Act, 2008 (Consolidated Appropriations Act, 2008)*. Joint Explanatory Statement to Accompany Consolidated Appropriations Amendment, Division C—Energy and Water, pp. 58e-58h.

Notes: Does not reflect applicable rescissions. 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, Safeguards and Security, and several adjustments.

The FY2008 request document includes data from NNSA's Future Years Nuclear Security Program (FYNSP), which projects the budget and components through FY2012 (see **Table 12**).

Table 12. NNSA Future Years Nuclear Security Program

($ millions)

	FY2008	FY2009	FY2010	FY2011	FY2012
DSW	$1,447.2	$1,483.4	$1,520.5	$1,558.5	$1,597.5
Campaigns	1,866.2	1,916.6	1,941.1	1,933.7	1,942.0
RTBF	1,662.1	1,698.4	1,765.5	1,862.7	1,952.6
Other[a]	1,535.7	1,606.6	1,677.0	1,756.0	1,831.9
Total	**6,511.3**	**6,705.0**	**6,904.0**	**7,111.0**	**7,324.0**

Source: DOE FY2008 Congressional Budget Request, vol. 1 (NNSA), pp. 59, 60.

Note: Does not reflect applicable rescissions. Details may not add to totals because of rounding.

a. Includes Secure Transportation Asset, Nuclear Weapons Incident Response, Facilities and Infrastructure Recapitalization Program, Environmental Projects and Operations, Safeguards and Security, and several adjustments.

Nuclear Weapons Complex Reconfiguration

In testimony before the House Appropriations Committee's Energy and Water Subcommittee in March 2004, the Secretary of Energy agreed to conduct a review of reconfiguring the nuclear weapons complex (the "Complex"). The committee's FY2005 energy and water report contained a requirement for that study. The committee was concerned about high costs, the security of fissile material distributed among many sites, and the size and age of the Complex. A task force

of the Secretary of Energy Advisory Board released its final report in October 2005. It recommended a Consolidated Nuclear Production Center (CNPC) that would make nuclear components (such as those of uranium or plutonium) and would assemble and dismantle nuclear weapons. It recommended consolidating uranium and plutonium, and probably closing several current sites. The House Appropriations Committee, in its FY2007 report, supported the task force's recommendations and rejected NNSA's "Complex 2030" plan to modernize the Complex with less consolidation. The committee recommended $100.0 million "for transition planning, site selection, and preliminary design and development for a consolidated nuclear production site for reliable replacement warheads and stockpile support." The bill as passed by the House provided this sum. NNSA had not requested funds for this purpose. The Senate Appropriations Committee did not recommend funds for this purpose, and the DOE FY2007 operating plan did not include such funds. For FY2008, NNSA did not request funds for CNPC, but did request funds throughout its proposed budget for upgrading and consolidating the Complex. In January 2007, it submitted a report to Congress on its plan for transforming the Complex. This plan included evaluation of CNPC in a draft Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement for Complex 2030.

The House Appropriations Committee, in its FY2008 report, expressed extreme displeasure with the Administration's rationale for the nuclear weapons program and with NNSA's plan for the Complex. It stated that the Reliable Replacement Warhead program (RRW, discussed below) and Complex 2030 "are being proposed in a policy vacuum without any Administration statement on the national security environment that the future nuclear deterrent is designed to address." Accordingly, "The Committee believes it is premature to proceed with further development of the RRW or a significant nuclear complex modernization plan, until a three-part planning sequence is completed." This sequence has three elements: "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...." "The Committee views completion of this three-part planning sequence as a necessary condition before considering additional funding for Complex 2030 and RRW activities." It noted its "strong reservations" on Complex 2030 and 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 expressed concern with NNSA's plans for the Complex. It felt that there was an inadequate linkage between warheads, the Complex, and strategy. "Congress should have a more vigorous analysis and debate of our national strategic defense policy prior to deciding whether to continue or terminate RRW development." Further,

> The Committee rejects the Department's premature deployment of the NNSA Complex 2030 consolidation effort. This plan was based on the adoption and deployment of the Reliable Replacement Warhead systems. The Government Accountability Office found this proposal to be lacking critical details about the size and military mission of the RRW system, which of course would dictate the size and makeup of the future stockpile including the necessity for a new pit manufacturing capability.

The committee also expressed concern about "sustaining the science capability at the laboratories." It directed DOE to provide (1) a comprehensive, long-term strategy for computation at the labs and (2) an R&D plan "that addresses unresolved physics and materials questions."

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 plans for the Complex, called Nuclear Weapons Complex Transformation. This plan, to be more fully described in a draft supplemental programmatic environmental impact statement to be released in January 2008, 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.[16]

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. The FY2008 DSW request would support life extension programs for the B61 gravity bomb and the W76 warhead for Trident II submarine-launched ballistic missiles. It would fund surveillance and maintenance for eight warhead types, dismantlement and disposition of retired warheads and components, and management and technology work linked to multiple warhead types or to no specific warhead type. It also included funds for the Reliable Replacement Warhead (RRW) program.

RRW originated as a funded program in the FY2005 Consolidated Appropriations Act, P.L. 108-447, which included $9.0 million for the program and described it as a "program to improve the reliability, longevity, and certifiability of existing weapons and their components." For FY2006, Congress appropriated $24.8 million. The FY2007 operating plan included $35.8 million, and the FY2008 request is $88.8 million. Outyear projections are FY2009, $99.8 million; FY2010, $109.2 million; FY2011, $167.4 million; and FY2012, $179.9 million. (See CRS Report RL32929, *The Reliable Replacement Warhead Program: Background and Current Developments*, by Jonathan Medalia, and CRS Report RL33748, *Nuclear Warheads: The Reliable Replacement Warhead Program and the Life Extension Program*, by Jonathan Medalia.)

Although RRW is a small part of the NNSA budget, the House Appropriations Committee, in its FY2006 report, viewed it as enabling large changes, such as transitioning the Complex "from a large, expensive Cold War relic into a smaller, more efficient modern complex" and allowing "long-term savings by phasing out the multiple redundant Cold War warhead designs that require maintaining multiple obsolete production technologies." The Senate Appropriations Committee stated that the recommended funding increase for RRW is "to accelerate the planning, development and design for a comprehensive RRW strategy that improves the reliability, longevity and certifiability of existing weapons and their components." The conference report emphasized that RRW "must stay within the military requirements of the existing deployed stockpile" and "must stay within the design parameters validated by past nuclear tests." P.L. 109-163, the FY2006 National Defense Authorization Act, section 3111, set seven objectives for the RRW program, including "[t]o increase the reliability, safety, and security of the United States

[16] 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.

nuclear weapons stockpile" and "[t]o further reduce the likelihood of the resumption of underground nuclear weapons testing."

For FY2007, the Administration requested $27.7 million for RRW. The House Appropriations Committee linked RRW with a restructured, smaller, and consolidated nuclear weapons complex: "The Committee supports the RRW, but only if it is part of a larger package of more comprehensive weapons complex reforms." It recommended $52.7 million for RRW but restricted use of the additional $25.0 million until NNSA delivered an infrastructure plan to Congress. The committee also directed NNSA to have the JASON Defense Advisory Group conduct a peer review of competing RRW designs and to analyze the premise of RRW—that a new warhead can be designed and deployed without nuclear testing. The bill as passed by the House left these provisions unchanged.

Also under DSW, the committee (1) reduced the $232.7 million request for warhead life extension programs by $80.0 million, directed NNSA to terminate the life extension program for the W80 warhead for cruise missiles, and used the funds to support weapons complex transformation, and (2) increased funding for warhead dismantlement from $75.0 million to $105.0 million to accelerate that activity. The bill as passed by the House left these provisions unchanged.

The Senate Appropriations Committee supported RRW. It found, "The directors of Los Alamos, Sandia and Livermore National Labs and the Commander, U.S. Strategic Command share the belief that maintaining incremental modifications to the existing and highly optimized legacy systems [i.e., life extension programs (LEPs) of warheads now in the stockpile] is not sustainable." It "urges the NNSA to accelerate the transition to a responsive infrastructure and to proceed expeditiously with the RRW design." It noted that DOD and the Nuclear Weapons Council no longer support the W80 LEP, and provided $10.0 million for a design competition for a second RRW in lieu of W80 LEP activities. It recommended $62.7 million for RRW and reducing funds for warhead dismantlement to $35.0 million, preferring to ensure that facilities for disassembling pits and for fabricating mixed-oxide fuel will be built before providing full funding. DOE's FY2007 operating plan included $35.8 million for RRW, $264.4 million for Life Extension Programs, and $75.0 million for weapons dismantlement and disposition.

NNSA requested $88.8 million for RRW for FY2008. (The Navy requested an additional $30.0 million for RRW; those funds are in the defense appropriations bill and are not discussed here.) NNSA had planned to use the FY2008 RRW funds mainly to develop a detailed cost, scope, and schedule baseline for RRW. Other DSW funds requested for FY2008 include $238.7 million for Life Extension Programs, $346.7 million for Stockpile Systems, $52.3 million for Weapons Dismantlement and Disposition, and $720.8 million for Stockpile Services. The latter category includes, for example, funds for production support, safety, and other work supporting multiple warhead types or otherwise not linked to one specific warhead.

The House Appropriations Committee expressed extreme dissatisfaction with the RRW program. Its FY2008 report stated, "The Committee finds the RRW program the DoD and NNSA have pursued at the direction of Congress goes far beyond the scope and purpose of the original congressional language and intent.... The Committee is unconvinced that pursuing the RRW design competition to a production phase is necessary at this time." Further,

> A particularly troubling issue for the Committee related to the RRW proposal is the contradictory U.S. policy position of demanding other nations give up their nuclear ambitions while the U.S. aggressively pursues a program to build new nuclear warheads. The Administration needs to develop a policy rationale that explains why the RRW program is not contradictory and does not undermine our international nuclear nonproliferation goals.

As noted above, the committee felt it necessary to have the planning sequence described earlier before continuing RRW design activities; accordingly, it recommended providing no funds for RRW for FY2008.

The committee recommended providing $1,336.6 million for DSW, a reduction of $110.6 million from the request. This reflects reductions of $88.8 million for RRW, $27.4 million for Stockpile Systems because of the termination of W80 warhead activities, and $115.5 million for Stockpile Services, and an increase of $121.0 million for weapons dismantlement and disposition. Regarding the latter category, the committee stated that DOE "must view dismantlement as a priority in and of itself, rather than as a workload leveling function to fill-in for down times in the life extension workload at Pantex." The committee also recommended transferring NNSA's activity to build a Pit Disassembly and Conversion Facility from the Office of Defense Nuclear Nonproliferation to the Office of Defense Programs, and directed DOE to begin the siting process to build the facility at Pantex Plant (TX) rather than at Savannah River Site (SC) to avoid security risks in transporting pits from Texas to South Carolina.

The Senate Appropriations Committee provided $66.0 million for NNSA for RRW in order to complete Phase 2A. As noted earlier, it made clear that it was not committed to proceeding with Phase 3 but wanted "a more vigorous analysis and debate" first. It wanted more information to help with this decision, such as characteristics of the future stockpile, the possible effects of RRW on U.S. nuclear nonproliferation efforts, and comparative costs of RRW vs. LEP. "It will be incumbent upon NNSA to provide specific details as to how many RRW weapons will be manufactured, how the Department of Defense intends to integrate the system into the stockpile and how many weapons from the existing deterrent can be retired." While it recommended funds to continue Phase 2A work on the first RRW type, it barred the use of funds for initial research on a second RRW type. In other areas of DSW, the committee recommended a net reduction of $37.7 million ($22.8 million from RRW, and $14.9 million, the entire amount requested, from "responsive infrastructure," a management program to support decisions on the Complex). It expressed concern with cost growth in the W76 LEP and commended DOE for recent efforts to increase the rate at which it dismantled nuclear warheads.

The consolidated appropriations bill eliminated NNSA funds for RRW. The explanatory statement said, "Congress believes a new strategic nuclear deterrent mission assessment for the 21st century is required to define the associated stockpile requirements and determine the scope of the weapons complex modernization plans." The largest change under DSW was to increase funding for weapons dismantlement and disposition from $52.3 million requested to $135.9 million. The bill also provided funds for the Pit Disassembly and Conversion Facility at Savannah River Site rather than at Pantex.

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." The FY2008 request includes six Campaigns, each with multiple components: Science, Engineering, Inertial Confinement Fusion and High Yield, Advanced Simulation and Computing, Pit Manufacturing and Certification, and Readiness. Many items within Campaigns have significance for policy decisions. As one example, the Science Campaign's goals include improving the ability to assess warhead performance without nuclear testing, improving readiness to conduct tests should the need arise, and maintaining the scientific infrastructure of the nuclear weapons laboratories. Campaigns also fund some large experimental facilities, such as the National Ignition Facility at Lawrence Livermore National Laboratory, the Dual-Axis Radiographic

Hydrotest Facility at Los Alamos National Laboratory, and the Microsystems and Engineering Sciences Applications Complex at Sandia National Laboratories.

NNSA's proposal to build a Modern Pit Facility (MPF) had been controversial for years. A pit is the fissile core of a nuclear weapon that is used to trigger a thermonuclear explosion. The United States has been unable to manufacture pits that can be certified for use in the stockpile since 1989. Los Alamos has a small-scale pit manufacturing facility, called TA-55; NNSA's plan is that TA-55 would be able to manufacture 10 pits per year by the end of FY2007 and 30-50 RRW pits per year by FY2012, but NNSA saw that capacity as insufficient to maintain the stockpile and favored building MPF, with a capacity of perhaps 125 pits per year. H.R. 2419, the FY2006 Energy and Water Development Appropriations Bill, as passed by the House, eliminated MPF funds until "capacity requirements tied to the long-term stockpile size are determined" and "until the long-term strategy for the physical infrastructure of the weapons complex has incorporated the Reliable Replacement Warhead strategy." The bill as passed by the Senate provided the amount requested for MPF, $7.7 million. The appropriation bill, as passed, provided no funds for MPF. Conferees on the energy and water bill directed NNSA to focus instead on improving manufacturing capability at TA-55. NNSA requested no funds for MPF for FY2007 and instead planned to increase capacity at TA-55. It requested $237.6 million for the Pit Manufacturing and Certification campaign for FY2007; H.R. 5427 as passed by the House provided that amount, and the Senate Appropriations Committee recommended that amount. The FY2007 operating plan included $242.4 million for this campaign, and the FY2008 request is $281.2 million. NNSA envisions a new pit manufacturing facility able to deliver 125 pits per year to the stockpile by 2022 as part of Complex 2030.[17]

The House Appropriations Committee recommended providing $150.0 million for pit manufacturing and certification for FY2008, a reduction of $131.2 million on grounds that the request has funds in multiple lines "that assume a preferred future programmatic approach" that "ensures unnecessary expenditures and lack of accountability." It linked pit funding to the strategic plan discussed above:

> The Committee will not continue to fund activities that are not part of a clearly articulated facilities strategy. Until the Committee receives a new nuclear weapons strategic plan that addresses the future requirements for plutonium production, including specifically how plutonium facilities factor into supporting the future stockpile, the Committee will not support funding activities that assume a modernization-in-place strategy for the current nuclear weapons complex.
>
> The Committee recommendation includes no funds for the consolidated plutonium center proposal.

The Senate Appropriations Committee recommended $256.3 million for pit manufacturing for FY2008, a reduction of $24.9 million. It "does not endorse the consolidated plutonium center and has not provided any funding for this activity" because DOD "has been unable to articulate a coherent policy and pit requirement for the stockpile."

The consolidated appropriations bill provided $215.8 million for pit manufacturing and certification. It provided no funds for the consolidated plutonium center. According to the explanatory statement,

> Until a modern nuclear weapons strategy, including required pit production capacity defined by nuclear stockpile requirements, is developed, the NNSA is directed to constrain

[17] U.S. Department of Energy. National Nuclear Security Administration. Office of Defense Programs. Complex 2030: *An Infrastructure Planning Scenario for a Nuclear Weapons Complex Able to Meet the Threats of the 21st Century*, DOE/NA-0013, October 2006, p. 11.

> the out-year planning for plutonium operations to a pit production capacity no greater than 80 pits per year. The NNSA Administrator is directed to provide quarterly reports to the Committees on Appropriations on pit production, with the first report due on April 1, 2008.

The appropriate test readiness posture—the time between a presidential order to resume testing and the conduct of the test—has been contentious. The posture was set at 24 to 36 months after the Cold War, but NNSA and others expressed concern that it had become 36 months or more. The Administration and Congress sought to shorten it, but there was a dispute over how much. NNSA and the Armed Services Committees favored an 18-month posture on grounds that it would take that long to prepare a test but that any testing should not be delayed beyond that time. The Appropriations Committees favored a 24-month posture, seeing an 18-month posture as provocative and more costly. The FY2006 appropriation was $19.8 million. In its FY2007 request, NNSA stated that it achieved a 24-month readiness posture in FY2005 and planned to maintain that posture at least through FY2011. It stated that the posture is 18 months "under current law" but that it "has thus far been limited to 24 months by Congressional funding." The FY2007 test readiness request was $14.8 million, and NNSA's operating plan included $14.6 million.

For FY2008, NNSA requested no funds for test readiness, but plans to request funds for FY2009. The House provided $20.0 million for test readiness to restore funding to this activity and keep it from being degraded. The House Appropriations Committee stated that it was "baffled by the Administration's decision to eliminate funding for nuclear test readiness after four budget cycles of insisting that shortening to an 18-month test readiness posture was required for national security reasons." The Senate Appropriations Committee recommended no funds for test readiness. The consolidated appropriations bill provided $5.0 million for this activity.

The consolidated appropriations bill provided $15.0 million for a new campaign, Advanced Certification, to be "focused very narrowly on addressing the long-term scientific issues related to continued certification of the nuclear stockpile without underground nuclear testing and [certain] scientific uncertainties."

The Engineering Campaign includes the Enhanced Surveillance Program (ESP), which seeks to develop "predictive capabilities for early identification and assessment of stockpile aging concerns ... to give NNSA a firm basis for determining when systems must be refurbished." It is conducting experiments to determine the service life of pits based on plutonium aging characteristics. The FY2007 request for ESP was $86.5 million, the operating plan provided $87.5 million, and the FY2008 request is $80.6 million. The House provided the requested funding both for ESP and for the entire Engineering Campaign, $152.7 million. The Senate Appropriations Committee recommended providing the requested funding for the Engineering Campaign, excepting an addition of $20.0 million for Enhanced Surety to "accelerate efforts ... to increase the safety, security and improved surveillance of nuclear weapons in the existing stockpile by developing modern surety technologies. ..." The consolidated appropriations bill provided $171.1 million for the Engineering Campaign, vs. $152.7 million requested. It added $9.6 million for Enhanced Surety and authorized transfer of $10.0 million for refurbishing an ion beam laboratory at Sandia National Laboratories.

According to NNSA, the Inertial Confinement Fusion (ICF) and High Yield Campaign "is to develop laboratory capabilities to create and measure extreme conditions ... approaching those in a nuclear explosion, and conduct weapons-related research in these environments." A key part of this campaign is the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory, which is already the world's most powerful laser. NNSA plans to complete the NIF project by March 30, 2010.

Cost growth of NIF has been of concern to Congress. Total project cost was originally estimated at $1,073.6 million in FY1996; the current estimate is $3,502.4 million.[18] For FY2007, NNSA requested $451.2 million for this campaign, of which $111.4 million was for NIF construction. H.R. 5427, as passed by the House, provided $528.2 million for this campaign, including the requested amount for NIF construction. The Senate Appropriations Committee said NNSA was pursuing "a NIF-at-all-costs strategy." It continued, "The NNSA has pursued this agenda as a means to justify an aggressive spending baseline at the expense of more compelling stewardship responsibilities in the ICF campaign. The NNSA has proven unable to maintain a balanced ICF and high yield research program. As such the Committee has reallocated funding out of NIF demonstration and Construction activities to ensure that there is adequate program balance." It recommended funding the campaign at $412.3 million and, within that sum, funding NIF construction at $81.4 million. The FY2007 operating plan included $489.7 million for this campaign, of which $111.4 million was for NIF construction.

The FY2008 request is $412.3 million, including $10.1 million for NIF construction. NNSA states that this latter decrease "reflects ramp down of construction work as the project nears completion." The House Appropriations Committee recommended increasing the request by $111.8 million to support reaching the 2010 ignition goal. The Senate Appropriations Committee recommended increasing the request by $46.9 million, of which $28.9 million was shifted from RTBF, mainly "to fully reestablish experimental capabilities on the refurbished Z facility" at Sandia National Laboratories in Albuquerque, NM. The Z facility is an inertial confinement fusion machine that uses high-energy x-rays (instead of lasers, as with NIF) to generate high energy densities for such tasks as research on materials and components, to evaluate performance of plutonium in nuclear weapons without nuclear testing, and to provide data used in validating computer simulations for stockpile stewardship including the Life Extension Program. The consolidated appropriations bill provided $474.4 million for the Inertial Confinement Fusion campaign, including an additional $15.1 million to accelerate NIF target development, restoration of $29.7 million for the Inertial Fusion Technology program, and an additional $13.0 million for Z machine operations. The bill provided another $28.9 million for Z machine operations under Readiness in Technical Base and Facilities.

Readiness in Technical Base and Facilities (RTBF)

This program funds infrastructure and operations at nuclear weapons complex sites. The FY2007 operating plan included $1,613.2 million, and the FY2008 request is $1,662.1 million. RTBF has six subprograms. The largest is Operations of Facilities ($1,150.1 million in the FY2007 operating plan, $1,159.3 million requested for FY2008). Others include Program Readiness, which supports activities occurring at multiple sites or in multiple programs ($75.2 million in the FY2007 operating plan, $71.5 million requested for FY2008), and Material Recycle and Recovery, which recovers plutonium, enriched uranium, and tritium from weapons production and disassembly ($70.0 million in the FY2007 operating plan, $70.0 million requested for FY2008). Construction is a separate category within RTBF; the FY2007 operating plan included $262.5 million, and the FY2008 request is $307.1 million.

For FY2007, the House Appropriations Committee recommended reducing RTBF by $27.0 million from the request, including an increase of $73.0 million for Operations of Facilities and a reduction of $100.0 million, from a request of $112.4 million, for a Chemistry and Metallurgy Research Facility Replacement (CMRR) at Los Alamos. CMRR would replace a building about

[18] U.S. Department of Energy, *FY 2008 Congressional Budget Request*, vol. 1, National Nuclear Security Administration, DOE/CF-014 (February 2007), p. 160.

50 years old that, among other things, conducts research into plutonium and supports pit production at TA-55. The committee stated that CMRR construction should be terminated and "[p]roduction capabilities proposed in the CMRR should be located at the future production site that supports the RRW and long term stockpile requirements." The committee noted that NNSA proposed to build a Consolidated Plutonium Production Center by 2022, so that "CMRR will serve its primary production support function for only eight years before it is made obsolete by the new plutonium facility." The House did not change these provisions in considering H.R. 5427. The Senate Appropriations Committee recommended $1,780.8 million for RTBF, including the amount requested for CMRR: "The Committee firmly believes [CMRR] will continue to play a central role in the plutonium mission at Los Alamos and is needed to support the research and chemistry mission of plutonium activities." The FY2007 operating plan included $53.4 million for CMRR, and the FY2008 request includes $95.6 million.

The House Appropriations Committee recommended the following amounts for RTBF for FY2008: for the entire program, $1,479.6 million, a reduction of $182.5 million from the request; Operations of Facilities, $1,041.4 million, a reduction of $117.9 million; Program Readiness, $71.5 million, as requested; Material Recycle and Recovery, $73.0 million, an increase of $3.0 million; and construction, $236.5 million, a reduction of $70.6 million. The committee recommended no funds for CMRR, instead of the $95.6 million requested, to halt construction at the facility. It 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. The NNSA is directed to develop a long-term plan to maintain the nation's nuclear stockpile requirements that does not assume an a priori case for the current program.

The Senate Appropriations Committee recommended the following amounts for RTBF for FY2008: for the entire program, $1,659.2 million, a reduction of $2.9 million from the request; Operations of Facilities, $1,126.4 million, a reduction of $32.9 million; Program Readiness, $71.5 million, as requested; Material Recycle and Recovery, $65.0 million, a reduction of $5.0 million; and construction, $352.1 million, an increase of $45.0 million. The committee recommended the $95.6 million requested for CMRR.

The consolidated appropriations bill provided $1,652.1 million for RTBF, $10.0 million less than the request, including $74.8 million for CMRR construction.

Other Programs

Weapons Activities includes four smaller programs in addition to DSW, Campaigns, and RTBF.

- Secure Transportation Asset provides for the transport of nuclear weapons, components, and materials safely and securely. It includes special vehicles used for this purpose, communications and other supporting infrastructure, and threat response. The FY2007 request was $209.3 million and the FY2007 operating plan included $209.5 million. The FY2008 request is $215.6 million, and the House and Senate Appropriations Committees recommended that amount. The consolidated appropriations bill provided $213.4 million.
- Nuclear Weapons Incident Response provides for use of DOE assets to manage and respond to a nuclear or radiological emergency within DOE, in the United States, or abroad. The FY2007 request was $135.4 million, and the FY2007 operating plan included $133.5 million. The FY2008 request is $161.7 million,

and the House and Senate Appropriations Committees recommended that amount. The consolidated appropriations bill provided $160.1 million.

- Facilities and Infrastructure Recapitalization Program (FIRP) provides for deferred maintenance and infrastructure improvements for the nuclear weapons complex. NNSA states that the purpose of RTBF, in contrast, is to "ensure that facilities necessary for immediate programmatic workload activities are maintained sufficiently." The FY2007 request for FIRP was $291.2 million. The House Appropriations Committee recommended reducing the latter sum by $145.0 million, and "directs the NNSA to reassess its out-year planning for FIRP projects to ensure coordination between FIRP funds and the reduced facility requirements consistent with the consolidation of the complex under the long-term Responsive Infrastructure planning." H.R. 5427 as passed by the House, left these provisions unchanged. The Senate Appropriations Committee made a number of changes to FIRP and recommended $283.2 million. It said the funds were "to restore, rebuild, and revitalize the physical infrastructure of the nuclear weapons complex." The FY2007 operating plan included $169.4 million. The FY2008 request is $293.7 million; the House Appropriations Committee recommended $137.7 million on grounds that NNSA should reassess how it will use the final years of FIRP funding in a way that is consistent with long-term plans for Complex transformation. The Senate Appropriations Committee recommended $262.7 million, urging that the "old facilities" that FIRP addresses "continue to be a drain on resources and should be demolished or disposed of as quickly as possible." The consolidated appropriations bill provided $181.6 million.
- Safeguards and Security (S&S) provides operations and maintenance funds for physical and cyber security, and related construction. In the wake of 9/11, the relevant threats and the Design Basis Threat changed. Ambassador Linton Brooks, then Administrator of NNSA, stated in 2005, "We must now consider the distinct possibility of well-armed and competent terrorist suicide teams seeking to gain access to a warhead in order to detonate it in place. This has driven our site security posture from one of 'containment and recovery' of stolen warheads to one of 'denial of any access' to warheads. This change has dramatically increased security costs for 'gates, guns, guards' at our nuclear weapons sites." The cost of S&S is a major concern for Congress and NNSA. Many changes have been proposed to reduce Complex security costs, such as reducing the area to be guarded by reducing the footprint of several sites and by consolidating uranium and plutonium at fewer sites. The FY2006 S&S appropriation was $797.8 million. The FY2007 request was $754.4 million, and the FY2007 operating plan included $761.2 million. The FY2008 request is $881.1 million. (The foregoing figures do not reflect S&S offsets for work for others of $32.0 million for FY2006, $33.0 million for FY2007, and $34.0 million for FY2008.) The House Appropriations Committee recommended $911.6 million for S&S, an increase of $30.5 million. The Senate Appropriations Committee recommended $893.1 million, an increase of $12.0 million. The increase would be used to complete cyber security upgrades of a secure network at Los Alamos. The committee expressed its frustration with "the continued climb in funding" for S&S, and recommended that the National Academy of Sciences report on S&S issues, including cost growth. The consolidated appropriations bill provided $907.6 million. It added $14.8 million to refurbish one building and complete

another at Idaho National Laboratory to consolidate and store uranium and plutonium, and for other missions.

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 13. DOE Defense Nuclear Nonproliferation Programs

($ millions)

Program	FY2007	FY2008 Request	House	Senate Comm.	Final[a]
Nonproliferation & Verification R&D	$270.4	$265.3	$440.4	$322.3	$365.8
Nonproliferation & International Security[b]	128.9	124.9	144.9	210.9	151.4
International Materials Protection, Control and Accounting (MPC&A)	472.7	371.8	831.8	391.8	630.2
Elimination of Weapons-Grade Plutonium Production	225.7	181.6	191.6	152.6	181.6
Fissile Materials Disposition	470.1	609.5	66.8[c]	666.5	66.8
Global Threat Reduction Initiative	115.5	119.6	251.3	185.6	195.0
Use of prior year balances[d]	—	—	—	(57.0)	(322.0)
Total	**1,683.3**	**1,672.6**	**2,070.6**	**1,872.6**	**1,336.9**

Sources: DOE FY2008 Congressional Budget Request; P.L. 110-5; DOE FY2007 Operating Plan; H.Rept. 110-185; S.Rept. 110-127, Explanatory Statement of Consolidated Appropriations Act.

Note: Numbers may not add due to rounding.

a. Total final appropriation reflects Section 312 rescission, but subprogram amounts do not.

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

c. Funding for MOX plant transferred to Nuclear Energy, and Pit Disassembly plant to NNSA.

d. From the Russian Fissile Materials Disposition program, MOX construction, and FY1999 emergency supplemental.

Funding for these programs in FY2007 was $1.818 billion, including $135 million appropriated in the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Act, 2007 (H.R. 2206, P.L. 110-28). For FY2008, the Administration requested $1.673 billion. The House Appropriations Committee recommended $1.684 billion, not including two construction projects for which the Administration requested $393.8 million and which the Appropriations Committee recommended moving to other programs. The omnibus funding act transfers the construction projects as recommended by the House and includes additional offsets, resulting in a net appropriation of $1.3369 billion (reflecting the across-the-board rescission).

The Nonproliferation and Verification R&D program was allotted $262.4 million in DOE's FY2007 Operating Plan; for FY2008, the Administration requested $265.3 million. The House Appropriations Committee, citing "the urgent need to develop advanced proliferation detection technology and nuclear explosion monitoring capability," boosted funding for this activity to $484.3 million. The omnibus act provides $390.8 million, not reflecting the rescission.

Nonproliferation and International Security programs include international safeguards, export controls, and treaties and agreements. They would have received $127.41 million in the FY2007 request, including the transfer of two previously independent programs: Russian Transition Initiatives and HEU Transparency Implementation. These three programs received $133.2 million in FY2006. The House bill and the Senate Appropriations Committee recommendation followed the Administration's request. The DOE Operating plan allotted $128.9 million for FY2007. The FY2008 request was $124.9 million. The House Appropriations Committee recommended increasing funding to $144.9 million. The omnibus act provides $151.4 million, not reflecting the rescission.

International Materials Protection, Control and Accounting (MPC&A), which is concerned with reducing the threat posed by unsecured Russian weapons and weapons-usable material, would have received $413.18 million under the President's FY2007 request, compared with $422.73 million appropriated for FY2006. P.L. 110-5 specified $472.7 million for this program. The FY2008 request was $371.8 million. The House Appropriations Committee recommended boosting MPC&A funding to $831.8 million, labeling the move "clear congressional direction to the Administration to shift the nuclear nonproliferation issues beyond marginally supported security programs to one accorded the highest priority in the war on world wide terror." The omnibus measure provides $630.2 million, not reflecting the rescission.

Requested funding for the Fissile Materials Disposition program for FY2006 was $653.1 million. The program's goal is disposal of U.S. surplus weapons plutonium by converting it into fuel for commercial power reactors, including construction of a facility to convert the plutonium to "mixed-oxide" (MOX) reactor fuel at Savannah River, South Carolina, and a similar program in Russia. The House Appropriations Committee cut funding for the Savannah River facility sharply for FY2006, citing delays in agreement with Russia over the program. The final appropriation for FY2006 was $468.8 million.

For FY2007, the Administration, noting that the issue that had delayed the program in Russia had been resolved, requested $603.3 million. However, the House Appropriations Committee report said "in 2006 it has become clear that the Russian government is not going to participate in the MOX-light water reactor" plan that the United States has proposed, and the House-passed version of H.R. 5427 would have cut the funding drastically to $248.0 million. The move would have shut down the MOX-fuel construction project at Savannah River.

The Senate Appropriations Committee in its FY2007 report likewise expressed disappointment that the Russian government was not pursuing its program to convert surplus weapons plutonium to MOX, but supported the continuation of the U.S. program to convert its own surplus weapons plutonium to MOX with continued construction of the facility at Savannah River. The Senate version of H.R. 5427 would have funded the Fissile Materials Disposition program at $618.4 million, $15 million more than requested by the Administration.

P.L. 110-5 specified that the "Secretary of Energy may not make available any of the funds provided by this division or previous appropriations Acts for construction activities for Project 99-D-143, mixed oxide fuel fabrication facility, Savannah River Site, South Carolina, until August 1, 2007." DOE's FY2007 Operating Plan allocated $470.1 million for Fissile Materials Disposition, including $262.5 million for Project 99-D-143.

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.

In contrast to the House action, the Senate Appropriations Committee recommended $609.5 million for the Fissile Materials Disposition program, including full funding for the MOX plant and the PDCF, instructing DOE to "proceed expeditiously with construction" of the two facilities and to "focus on delivering this project at cost and on time." In view of the delays in the Russian side of the program, the committee said it is "not backing away from the United States obligation to provide assistance to this program" but instructed DOE to rescind $57 million already appropriated to be directed to the U.S. construction projects.

The omnibus funding act adopted the House position, transferring the MOX plant and PDCF to other programs. The net appropriation for the program was reduced to $66.8 million, not reflecting the rescission.

Environmental Management

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

The adequacy of funding to address health and environmental risks resulting from the past production of nuclear weapons is a long-standing issue. DOE established the Office of Environmental Management in 1989 to consolidate its efforts to administer the cleanup of former nuclear weapons sites. These efforts include the disposal of radioactive and other hazardous wastes, management and disposal of surplus nuclear materials, the remediation of soil and groundwater contaminated from such wastes, and the decontamination and decommissioning of excess buildings and facilities. Through this program, DOE also administers the disposal of wastes and remediation of contamination at sites where the federal government conducted civilian nuclear energy research. Altogether, there were 114 "geographic"[19] sites in 30 states where these activities resulted in the generation of wastes and contamination.

Some of the ongoing issues associated with the disposal of wastes and the cleanup of contamination have been the adequacy of risk-based approaches to address these needs; the technical soundness of waste treatment facility designs; how to safely remove, treat, and dispose of high-level radioactive waste stored in underground tanks;[20] the effectiveness and cost-savings of incentive-based cleanup contracts; and the pace and adequacy of cleanup overall. The challenges of the Environmental Management Program to dispose of wastes and clean up

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

[20] See CRS Report RS21988, *Radioactive Tank Waste from the Past Production of Nuclear Weapons: Background and Issues for Congress*, by David M. Bearden and Anthony Andrews.

contamination are substantial and require significant resources. As such, this program represents approximately one-fourth of the Department's total budget.

Congressional Action on FY2008 Appropriations

The Consolidated Appropriations Act for FY2008 provided a total of $5.75 billion for DOE's Environmental Management Program. However, the final funding is subject to two across-the-board rescissions, somewhat reducing the appropriation. Nearly all of the $5.75 billion is subject to a 0.91% rescission, whereas $17.5 million of that amount for congressionally designated projects is subject to a higher rescission of 1.6%. These rescissions apply to funding not only for the Environmental Management Program, but to all DOE activities funded in Title III of Division C, as required by Section 312 of that title. Prior to the final bill, the House had proposed a higher amount of $6.21 billion for the Environmental Management Program, and the Senate Appropriations Committee had recommended $6.00 billion. The President had proposed the lowest amount under consideration for FY2008, requesting $5.66 billion for the program. Congress appropriated $6.19 billion for FY2007.

Although the House initially had proposed the highest amount for FY2008, nearly $200 million of its increase would not have provided additional resources for the program. Rather, this increase was due to the House's proposal to consolidate funding for the Office of Legacy Management with the Environmental Management Program. This office has been funded independently under other accounts, and is responsible for long-term site care after cleanup is complete under the Environmental Management Program. In its initial bill, the Senate Appropriations Committee had rejected the House's proposal, and recommended that the Office of Legacy Management continue to be funded in other accounts independent of the Environmental Management Program. Taking this accounting difference into consideration, the House and the Senate Appropriations Committee had recommended similar levels of funding for the Environmental Management Program as a whole. In the final bill, Congress followed the approach of the Senate Appropriations Committee, and did not consolidate funding for these two functions. See the "Office of Legacy Management" section later in this report.

The FY2008 enacted appropriation of $5.75 billion (prior to rescissions) for the Environmental Management Program is significantly less than the $6.19 billion that Congress appropriated for FY2007. However, this difference in total funding is largely because of a $425.7 million decrease in funds for "accelerated closure" sites where all planned cleanup actions are complete under the Environmental Management Program. These sites include Rocky Flats (CO), Fernald (OH), and several other defense sites. Congress had increased funding at these sites for several years to speed the pace of cleanup. These sites were suitable for accelerated cleanup because the challenges were more technically feasible to address than those at more complex sites. Now that most of the work is completed at some sites, and nearing completion at others, there has been a corresponding downward trend in funding as these needs have diminished.

Although DOE has accomplished much in accelerating cleanup at the above sites, substantial challenges remain at many other sites where cleanup is not complete and large quantities of wastes and contamination are still present. For these and other pending sites, there are varying decreases and increases in funding when comparing the appropriation enacted for FY2008 to the initial recommendations of the House and the Senate Appropriations Committee, the President's FY2008 request, and the appropriation for the prior year in FY2007. (See **Table 14**.) These differences in funding are due to differing priorities among other competing needs within the federal budget, opposing views on the adequacy of funding to meet cleanup needs, and varying factors at individual sites, such as the technical complexity of cleanup, the prioritization of

remedial actions based on health and environmental risks, scheduling of actions to meet time frames in regulatory agreements, and numerous other considerations.

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

Various engineering and design issues have delayed construction of the Waste Treatment and Immobilization Plant at Hanford. The President had requested $690.0 million for the construction of this facility in FY2008, the same amount as Congress appropriated in FY2007. The request also included $273.4 million for the management of the wastes still stored in the underground tanks, slightly less than the FY2007 appropriation of $277.1 million. Prior to rescissions, the appropriation enacted for FY2008 included $690.0 million for the construction of the waste treatment plant, and $288.4 million for managing the tank wastes while the construction of the plant continues.

The House initially had proposed $590.0 million for the waste treatment plant, and the same amount as the President requested for managing the tank wastes. In its initial report, the House Appropriations Committee had indicated that its proposed lower funding for the plant could have been augmented with $100.0 million in "uncosted balances" carried over from FY2007 because of slow construction progress, raising the total available to the President's request of $690.0 million. The Senate Appropriations Committee had recommended the full request for the waste treatment plant without the use of these uncosted balances, and had recommended a higher amount of $326.0 million for managing the tank wastes.

Table 14 indicates appropriations that Congress enacted for the Environmental Management Program for FY2008, compared to the initial recommendations of the full House and the Senate Appropriations Committee prior to the enactment of the final bill, the President's request, and the prior-year appropriation in FY2007. Amounts are indicated for each of the three statutory accounts that fund the Environmental Management Program, and for selected sites and program activities within those accounts in which there has been broad congressional interest. The amounts enacted for FY2008 are as presented in the *Congressional Record* of December 17, 2007, which do not reflect the across-the-board rescission of 0.91% for ongoing program elements, and 1.6% for congressionally designated projects.

Table 14. Environmental Management Program Appropriations

($ millions)

Environmental Management Program Accounts	FY2007 Enacted	FY2008			
		Request	House	Senate Committee	Enacted
Defense Environmental Cleanup					
Accelerated Closure Sites	$468.1	$42.4	$42.4	$55.9	$42.4
Ashtabula	$1.3	$0.3	$0.3	$0.3	$0.3
Fernald	$254.8	$0.0	$0.0	$13.5	$0.0
Miamisburg	$39.9	$30.3	$30.3	$30.3	$30.3
Rocky Flats	$115.5	$0.0	$0.0	$0.0	$0.0
Closure Sites Administration	$56.6	$11.8	$11.8	$11.8	$11.8
Hanford	$1,802.4	$1,840.5	$1,813.4	$1,966.4	$1,873.0
Richland Office	$835.3	$877.1	$950.0	$950.4	$894.6
Office of River Protection	$967.1	$963.4	$863.4	$1,016.0	$978.4
Waste Treatment Plant	*$690.0*	*$690.0*	*$590.0*	*$690.0*	*$690.0*
Tank Farm Activities	*$277.1*	*$273.4*	*$273.4*	*$326.0*	*$288.4*
Savannah River Site	$1,113.4	$1,206.1	$1,160.5	$1,200.1	$1,141.6
Idaho National Laboratory	$526.9	$504.0	$600.8	$532.9	$513.0
Oak Ridge Reservation	$203.9	$179.3	$235.3	$179.3	$192.3
Waste Isolation Pilot Plant	$228.8	$219.7	$219.7	$250.7	$236.7
NNSA and Nevada Off-Sites	$306.5	$271.1	$271.1	$361.7	$292.9
Technology Development	$21.4	$21.4	$108.1	$55.1	$21.4
Safeguards and Security	$275.9	$273.4	$278.4	$273.6	$261.7
Program Direction[a]	$294.5	$309.8	$341.8	$309.8	$309.8
Program Support	$38.0	$33.1	$35.1	$41.9	$33.1
Federal Payment to Uranium Enrichment D&D Fund[b]	$452.0	$463.0	$463.0	$463.0	$463.0
Defense Legacy Management[a]	$0.0	$0.0	$148.1	$0.0	$0.0
Material Consolidation[c]	$0.0	$0.0	$50.3	$0.0	$0.0
Congressionally Directed Projects	$0.0	$0.0	$0.0	$0.0	$17.5
Subtotal Defense Environmental Cleanup[d]	$5,731.8	$5,363.9	$5,768.0	$5,690.4	$5,398.6
Transfer to ES&H[e]	$0.0	$0.0	$-1.5	$0.0	$0.0
Total Defense Environmental Cleanup	$5,731.8	$5,363.9	$5,766.6	$5,690.4	$5,398.6
Non-Defense Environmental Cleanup[a]	$349.9	$180.9	$286.0	$195.4	$183.9

Environmental Management Program Accounts	FY2007 Enacted	FY2008			
		Request	House	Senate Committee	Enacted
Uranium Enrichment D&D Fund[d]	$556.6	$573.5	$618.8	$573.5	$627.9
Uranium Enrichment D&D Fund Offset[b]	$-452.0	$-463.0	$-463.0	$-463.0	$-463.0
Total Environmental Management Program	$6,186.3	$5,655.3	$6,208.4	$5,996.3	$5,747.4

Sources: Prepared by the Congressional Research Service with information from H.Rept. 110-185, S.Rept. 110-127, and the joint explanatory statement accompanying Title III of Division C of the Consolidated Appropriations Act for FY2008 (P.L. 110-161, H.R. 2764), as presented in the *Congressional Record*, December 17, 2007, House, p. H15942, and pp. H15948-H15950, which does not reflect applicable rescissions.

a. The House Appropriations Committee recommended the consolidation of the Office of Legacy Management into the Environmental Management Program, including $11.0 million within the Program Direction line-item in the Defense Environmental Cleanup account, $148.1 million as a separate line-item within that defense account, and $35.1 million as a separate line-item within the Non-Defense Environmental Cleanup account. Combined, the House Appropriations Committee recommended a total of $194.2 million for the Office of Legacy Management. The President requested this same amount, but in different accounts in which Congress has provided this funding in past years. The President requested $159.1 million for defense Legacy Management within the Other Defense Activities account, and $35.1 million for non-defense Legacy Management within the Energy Supply and Conservation account, for a total of $194.2 million. The Senate Appropriations Committee recommended similar funding within the existing account structure, as was adopted in the final bill but in a slightly lower amount.

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

c. The House Appropriations Committee recommended a new Office of Materials Consolidation, which was not included in the President's FY2008 request. The Senate Appropriations Committee did not recommend any funding for such an office, nor did Congress include any funding for this office in its enactment of appropriations for FY2008.

d. P.L. 110-5http://www.congress.gov/cgi-lis/bdquery/R?d110:FLD002:@1(110+5) provided a total of $5,730,448,000 for the Defense Environmental Cleanup account. DOE allocated $5,731,839,000 for this account in its FY2007 Operating Plan, but did not explain the difference from the statutory appropriation provided in P.L. 110-5. The House Appropriations Committee report specified the same amount of funding for FY2007 as in DOE's Operating Plan. The Senate Appropriations Committee specified a slightly higher amount of $5,731,849,000 in its report.

e. ES&H = Environmental Safety and Health account. The House Appropriations Committee recommended a transfer of $1.5 million from the Dense Environmental Cleanup account to the Environmental Safety and Health account in FY2008. The Senate Appropriations Committee did not recommend this transfer of funds, nor did Congress include such a transfer in its enactment of appropriations for FY2008.

Estimated Future Funding Needs

The need for annual appropriations of several billion dollars to clean up nuclear waste sites has motivated ongoing concern within Congress about the long-term financial liability of the United States to meet these needs. Accordingly, there has been much debate about how to ensure public health and safety, and the protection of the environment, in the most expedient and cost-effective manner. DOE reports that it had cleaned up 81 of the 114 geographic sites as of the end of FY2006.[21] Although DOE has disposed of substantial quantities of waste and remediated many areas of contamination at the remaining sites, much work remains to be done to complete cleanup

[21] DOE, Office of the Chief Financial Officer, FY2008 Congressional Budget Request, February 2007, vol. 5, Environmental Management, p. 31. DOE referenced 108 geographic sites, as it excluded six Nevada off-sites proposed for transfer to the Office of Legacy Management. The total of 114 geographic sites noted above includes these six sites.

at many of them. DOE expects to complete cleanup at certain sites within the next few years. However, the Department anticipates cleanup to continue for decades at the larger and more complex sites, such as Hanford, Savannah River, and the Idaho National Laboratory, where high-level radioactive waste is in need of treatment and disposal, and soil and groundwater contamination are generally more severe. Based on recent assumptions, DOE expects cleanup and disposal of wastes to be complete at Savannah River in 2031, at the Idaho National Laboratory in 2035, and at Hanford in 2042.[22]

Accurately assessing the time and funding needed to complete cleanup and dispose of all radioactive and other hazardous wastes is difficult at best. Developing reliable estimates is especially challenging for the larger, more complex sites where many final decisions have yet to be made because of technical limitations and uncertainties, such as the "end state"[23] of many sites. DOE periodically revises its estimates of outstanding costs to complete cleanup and dispose of wastes as individual project baselines and assumptions change. These estimates have varied widely over time by many billions of dollars. DOE reports its financial liabilities for the Environmental Management Program, and all of its other program responsibilities, in its annual financial statements contained in the Department's performance and accountability reports. DOE's most recent *Performance and Accountability Report for FY200*6 estimated that $159 billion would be needed to complete cleanup and dispose of wastes at the remaining sites administered under DOE's Environmental Management Program. The $159 billion estimate is in FY2006 dollars, and DOE notes that "future inflation could cause actual costs to be substantially higher than the recorded liability."[24]

In addition to inflation, other factors could cause actual costs to exceed the $159 billion estimate. For example, actual costs could be higher than expected, depending on whether federal and state regulators may require more stringent and costlier cleanup actions than DOE plans to take. Costs also could rise if initial cleanup actions prove inadequate to protect human health and the environment over the long-term. Future performance of cleanup actions is especially critical for nuclear waste sites because of the rate of decay of radioactivity, which can be thousands of years, depending on the particular radionuclide. Predicting the effectiveness of methods to contain radioactive wastes over such long periods of time is challenging, if not impracticable, in some cases. Consequently, additional funding could be needed at sites where cleanup was thought to be complete, if the initial cleanup proves inadequate over time.

DOE's $159 billion estimate also does not include the costs of long-term care of sites once wastes are disposed of, and cleanup remedies are in place, to ensure the protection of human health and the environment into the future. DOE's *Performance and Accountability Report for FY2006* estimated that, as of the end of FY2006, $18 billion would be needed for cleanup and post-closure site responsibilities after work under the Environmental Management Program is completed.[25]

---

[22] Ibid., p. 40. Two separate offices within the Environmental Management Program administer cleanup and disposal of wastes at Hanford: the Richland Office and the Office of River Protection. The projected completion date for activities of the Richland Office is 2035, and the projected completion date for activities of the Office of River Protection is 2042. The primary purpose of this latter office is to remove, treat, and dispose of high-level radioactive waste stored in underground tanks near the Columbia River.

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

[24] DOE, *Performance and Accountability Report for FY2006*, DOE/CF-0012, pp. 173-175.

[25] Ibid.

These responsibilities include surveillance and monitoring, long-term operation and maintenance of soil and groundwater cleanup remedies, and disposal of excess materials remaining on-site after closeout under the Environmental Management Program. DOE estimated that this $18 billion cost would be incurred over 75 years through FY2081.[26] DOE expects some long-term site care to be needed beyond this time, requiring additional funding. However, the Department "believes" that costs beyond 75 years cannot "reasonably" be estimated because of uncertainties inherent to such distant time frames.[27] Funding for long-term site care, and other related responsibilities at these sites, is discussed below.

Long-Term Site Care

Once a site is cleaned up and there is no continuing DOE mission, responsibility for long-term care of the site is transferred to DOE's Office of Legacy Management.[28] This office also manages the payment of pensions and post-retirement benefits of former contractor personnel who worked at these sites.[29] As indicated in **Table 15**, Congress appropriated a total of $190.6 million (prior to rescissions) for the Office of Legacy Management in FY2008. Of this amount, $156.4 million was allocated to defense sites, and $34.2 million was allocated to non-defense sites. The House initially had agreed to the President's total request of $194.2 million for the Office of Legacy Management, while the Senate had recommended a slightly higher amount of $194.7 million. All of these amounts are a large increase above the $64.1 million that Congress appropriated for FY2007.

As discussed earlier, the House had recommended consolidating the funding for the Office of Legacy Management with the Environmental Management Program. In its initial report, the House Appropriations Committee had noted its expectation that the Office of Legacy Management continue to operate as a separate office within the Environmental Management Program. The effect of this proposed consolidation would appear to have been a shift in funds among accounts, rather than a change in the office's administration or function. The Senate Appropriations Committee had not recommended this change in accounting, but had proposed funding within the existing account structure, as was adopted in the enacted bill but in a slightly lower amount.

Although the appropriation enacted for FY2008 is somewhat less than the President requested and the House and the Senate Appropriations Committee had proposed, the enacted amount is still a $126.5 million increase above the FY2007 appropriation. The reason for such a substantial increase is primarily because of greater funding needs for long-term care, and pension and post-retirement benefits, at defense sites transferred from the Environmental Management Program after physical cleanup is complete. As more sites are transferred upon the completion of cleanup in future years, funding needs for Legacy Management will grow accordingly.

[26] Ibid.

[27] Ibid.

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

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

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

Type of Site	FY2007 Enacted	FY2008			
		Request	House	Senate Committee	Enacted
Defense	$30.9	$159.1	$159.1	$159.6	$156.4
Non-defense	$33.2	$35.1	$35.1	$35.1	$34.2
Total	$64.1	$194.2	$194.2	$194.7	$190.6

Sources: Prepared by the Congressional Research Service with information from H.Rept. 110-185, S.Rept. 110-127, and the joint explanatory statement accompanying Title III of Division C of the Consolidated Appropriations Act for FY2008 (P.L. 110-161, H.R. 2764), as presented in the *Congressional Record*, December 17, 2007, House, p. H15941 and p. H15950, which does not reflect applicable rescissions.

Power Marketing Administrations

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

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

The Administration's FY2008 request for the PMAs was $240.4 million (**Table 7**).[30] House Committee funding recommendations for the PMAs are the same as the Administration's FY2008 Budget Request. The Senate Appropriations Committee recommended funding for SWPA and SEPA at the same levels requested in the President's budget and recommended by the House. However, the Senate recommended a funding increase of $30 million for WAPA. The increased funding for WAPA is based on the Senate Appropriations Committee's concern for transmission system reliability due to WAPA's increased reliance on alternative financing. This additional funding is for construction, program direction, and O&M—program areas whose funding WAPA intended to offset with alternative financing efforts. The final bill enacted by Congress provides approximately $30 million above the Administration's request for WAPA, as recommended by the Senate.

[30] This figure does not include -$23.0 million for the anticipated difference between WAPA's Colorado River Basins Power Marketing Fund (CRBPMF) expenses and offsetting collections. DOE tables indicate a net request for the PMAs of $217.4 which reflects the difference between CRBPMF expenses and offsetting collections. Congressional tables do not follow this practice.

PMA appropriations are affected by a 0.91% across-the-board rescission on all Department of Energy discretionary accounts. Reflecting the rescission, the final appropriation for the PMAs is $268.0 million.

In FY2008 WAPA, SEPA, and SWPA proposed to assign "Agency Rates" to new obligations. The Agency Rate is the rate at which federal corporations and BPA borrow. This change was expected to have a rate impact of less than 1% (the Agency Rate was 0.4% higher on average than PMA rates from 1997-2005). However, section 310 of P.L. 110-161 prohibits this change.

BPA receives no annual appropriation but funds some of its activities from permanent borrowing authority, which was increased in FY2003 from $3.75 billion to $4.45 billion (a $700 million increase). BPA plans to use $538 million of its borrowing authority in FY2008. The House and Senate Appropriations Committees recommend no additional borrowing authority for BPA. Beginning in FY2008, BPA proposed to use secondary net revenues beyond $500 million to make advance amortization payments to the Treasury on BPA's bond obligations. BPA is expecting this additional revenue to be $130 million in FY2008. The Appropriations Committees have opposed similar proposals in the past and indicate that they hope the Administration will not purse this proposal in FY2008 or FY2009.[31]

Title IV: Independent Agencies

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

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

Program	FY2007	FY2008 Request	House	Senate	Final
Appalachian Regional Commission	$65.0	$65.0	$35.0	$75.0	$73.0
Nuclear Regulatory Commission	821.6	916.6	933.8	919.3	926.1
(Revenues)	(667.4)	(765.1)	(765.1)	(765.6)	(779.1)
Net NRC (including Insp. Gen.)	154.2	151.5	168.7	153.7	147.0
Defense Nuclear Facilities Safety Board	21.8	22.5	22.5	22.5	21.9
Nuclear Waste Technical Review Board	3.6	3.6	3.6	3.6	3.6
Denali Commission	49.5	2.0	1.8	31.8	21.8
Fed. Coordinator, Alaska Gas Projects	—	—	—	2.3	2.3
Delta Regional Authority	11.9	6.0	6.0	12.0	11.7
Total	**306.0**	**251.5**	**237.8**	**301.0**	**281.3**

Source: FY2008 Budget Request; H.Rept. 110-185; S.Rept. 110-127; Consolidated Appropriations Act, 2008, P.L. 110-161.

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

Key Policy Issues—Independent Agencies

Nuclear Regulatory Commission

The Nuclear Regulatory Commission (NRC) received a total budget of $926.1 million for FY2008, including $8.7 million for the NRC inspector general's office. The FY2008 appropriation is about $10 million above the Administration's request and more than $100 million above the FY2007 funding level of $824.9 million. Major activities conducted by NRC include safety regulation and licensing of commercial nuclear reactors, licensing of nuclear waste facilities, and oversight of nuclear materials users.

The NRC budget request included $216.9 million for new reactor activities, largely to handle anticipated new nuclear power plant license applications. No commercial reactor license applications have been submitted to NRC since the 1970s, but higher fossil fuel prices and incentives provided by the Energy Policy Act of 2005 (P.L. 109-58) have prompted electric utilities to announce plans for more than 30 reactor license applications over the next few years. NRC's proposed budget also included $37.3 million for licensing DOE's planned Yucca Mountain nuclear waste repository, with the expectation that DOE would submit a repository license application in FY2008.

For reactor oversight and incident response, NRC's FY2008 budget request included $246.4 million. NRC plans to oversee about 150 annual reactor security inspections, including 21 force-on-force exercises, during FY2008. (For more information on protecting licensed nuclear facilities, see CRS Report RS21131, *Nuclear Power Plants: Vulnerability to Terrorist Attack*, by Mark Holt and Anthony Andrews.)

The omnibus appropriations measure reduced NRC's nuclear waste licensing request by $8 million, "given the almost certain delay in the Department of Energy filing a license application for the Yucca Mountain Repository," according to the explanatory statement. Added to the NRC budget were $15 million to support nuclear science and engineering education, and $2.2 million for enhancing foreign security over radioactive material.

The Energy Policy Act of 2005 permanently extended a requirement that 90% of NRC's budget be offset by fees on licensees. Not subject to the offset are expenditures from the Nuclear Waste Fund to pay for waste repository licensing, spending on generic homeland security, and DOE defense waste oversight. The offsets in the omnibus measure result in a net appropriation of $147.0 million, $3.5 million below the request.

For Additional Reading

CRS Products

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

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

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

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

CRS Report RL30478, *Federally Supported Water Supply and Wastewater Treatment Programs*, coordinated by Claudia Copeland.

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

CRS Report RL31098, *Klamath River Basin Issues: An Overview of Water Use Conflicts*, by Betsy A. Cody, Pamela Baldwin, and Eugene H. Buck.

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

CRS Report RS21131, *Nuclear Power Plants: Vulnerability to Terrorist Attack*, by Mark Holt and Anthony Andrews.

CRS Report RL31993, *Nuclear Warhead "Pit" Production: Background and Issues for Congress*, by Jonathan Medalia.

CRS Report RL32130, *Nuclear Weapon Initiatives: Low-Yield R&D, Advanced Concepts, Earth Penetrators, Test Readiness*, by Jonathan Medalia.

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

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

CRS Report RL32189, *Terrorism and Security Issues Facing the Water Infrastructure Sector*, by Claudia Copeland.

Author Information

Carl E. Behrens, Coordinator
Specialist in Energy Policy

Anthony Andrews
Specialist in Energy and Energy Infrastructure Policy

David M. Bearden
Specialist in Environmental Policy

Nicole T. Carter
Specialist in Natural Resources Policy

Mark Holt
Specialist in Energy Policy

Nic Lane
Analyst in Natural Resources Policy

Daniel Morgan
Analyst in Science and Technology Policy

Fred Sissine
Specialist in Energy Policy

Jonathan Medalia
Specialist in Nuclear Weapons Policy

Carol Glover
Information Research Specialist

Key Policy Staff

Area of Expertise	Name	CRS Division
General	Carl Behrens Carol Glover	RSI KSG
Corps of Engineers	Nicole Carter Steve Hughes	RSI RSI
Bureau of Reclamation	Nic Lane Betsy Cody	RSI RSI
Solar and Renewable Energy	Fred Sissine	RSI
Nuclear Energy	Mark Holt	RSI
Science Programs	Daniel Morgan	RSI
Nuclear Weapons Stewardship	Jonathan Medalia	FDT
Nonproliferation and Terrorism	Carl Behrens	RSI
DOE Environmental Management	David Bearden	RSI
Power Marketing Administrations	Nic Lane	RSI
Bonneville Power Administration	Nic Lane	RSI
Fossil Energy Research	Anthony Andrews	RSI
Strategic Petroleum Reserve	Robert Bamberger	RSI
Energy Conservation	Fred Sissine	RSI
Budget Data and Report Preparation	Carol Glover	KSG

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

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.