Energy and Water Development: FY2021 Appropriations

Updated March 25, 2021

Congressional Research Service
https://crsreports.congress.gov
R46384

CRS REPORT
Prepared for Members and
Committees of Congress

Congressional Research Service
Informing the legislative debate since 1914

SUMMARY

R46384

March 25, 2021

Mark Holt
Specialist in Energy Policy

Corrie E. Clark
Analyst in Energy Policy

Energy and Water Development: FY2021 Appropriations

The Energy and Water Development and Related Agencies appropriations bill provides funding for civil works projects of the U.S. Army Corps of Engineers (USACE); the Department of the Interior's Bureau of Reclamation (Reclamation) and Central Utah Project (CUP); the Department of Energy (DOE); the Nuclear Regulatory Commission (NRC); the Appalachian Regional Commission (ARC); and several other independent agencies. DOE typically accounts for about 80% of the bill's funding.

Overall Funding Totals

President Trump submitted his FY2021 budget proposal to Congress on February 10, 2020. The budget requests for agencies included in the Energy and Water Development appropriations bill totaled $42.559 billion, including budget offsets. This was $5.764 billion (12%) below the FY2020 enacted Energy and Water Development total of $48.324 billion, not including supplemental appropriations. The House Appropriations Committee approved its FY2021 Energy and Water Development appropriations bill July 13, 2020 (H.R. 7613, H.Rept. 116-449). The Energy and Water bill was included as Division C in the second FY2021 consolidated appropriations bill (H.R. 7617), passed by the House July 31, 2020. The House-passed bill would have provided total non-emergency energy and water development funding of $49.601 billion, including offsets. This was $1.278 billion (3%) above the FY2020 enacted level and $7.042 billion (17%) above the request. The Chairman of the Senate Appropriations Committee released a draft FY2021 Energy and Water bill and explanatory statement on November 10, 2020 (https://www.appropriations.senate.gov/news/committee-releases-fy21-bills-in-effort-to-advance-process-produce-bipartisan-results), which included $51.864 billion for Energy and Water Development programs—$9.305 billion above the budget request and $3.540 billion above the FY2020 enacted appropriation, excluding emergency appropriations. FY2021 Energy and Water Development funding was enacted by Division D of the Consolidated Appropriations Act, 2021 (P.L. 116-260), signed by the President on December 27, 2020. The enacted Energy and Water appropriations totaled $49.525 billion, $1.201 billion (2%) above the FY2020 enacted level, excluding emergency appropriations and scorekeeping adjustments.

Energy and Water Development Appropriations, FY2020 Enacted Through FY2021 Enacted

Dollars in millions (and % change from 2020 enacted)

Agency	FY2020 Enacted	FY2021 Request	FY2021 House	FY2021 Senate Majority Draft	FY2021 Enacted
Corps of Engineers	7,650	5,966 (-22%)	7,629 (0%)	7,722 (+1%)	7,796 (+2%)
Bureau of Reclamation/CUP	1,680	1,138 (-32%)	1,655 (-1%)	1,690 (+1%)	1,691 (+1%)
Department of Energy	38,657	35,732 (-8%)	40,864 (+6%)	42,041 (+9%)	39,627 (+3%)
Independent Agencies	407	333 (-18%)	389 (-5%)	413 (+1%)	414 (+2%)
Rescissions	-71	-610	-935	-2	-3
Total	48,324	42,559 (-12%)	49,601 (+3%)	51,864 (+7%)	49,525 (+2%)

Source: P.L. 116-260 and Explanatory Statement on H.R. 133, H.Rept. 116-449, Senate Appropriations Committee majority draft explanatory statement on FY2021 Energy and Water Development Appropriations.

Notes: CUP=Central Utah Project Completion Account. Enacted amounts do not include subsequent emergency supplemental appropriations. FY2021 House levels exclude emergency appropriations and certain offsets.

Emergency Funding

Title VI of the House-passed bill included $44.05 billion in emergency FY2021 funding—nearly doubling the bill's total appropriations to $93.651 billion. These "additional infrastructure investments" were intended "to support the economic recovery from the coronavirus pandemic," according to the House Appropriations Committee report. USACE was to receive $17.0 billion, Reclamation $3.0 billion, and DOE $24.050 billion. Neither the draft Senate bill nor the enacted measure included additional emergency appropriations for Energy and Water Development programs as passed by the House.

Major Issues

Major Energy and Water Development provisions in the Consolidated Appropriations Act, 2021, included the establishment of a national uranium reserve (at half the requested amount), funding for renewable energy grid integration and storage, funding for artificial intelligence and quantum information science initiatives, a nearly 25% increase in nuclear weapons activities, and the first funding for the Southwest Border Regional Commission. Trump Administration proposals to limit funding for water projects, reduce energy R&D funding, eliminate weatherization grants for low-income households, and end DOE loan and loan guarantee programs were not adopted.

Contents

Figures

Tables

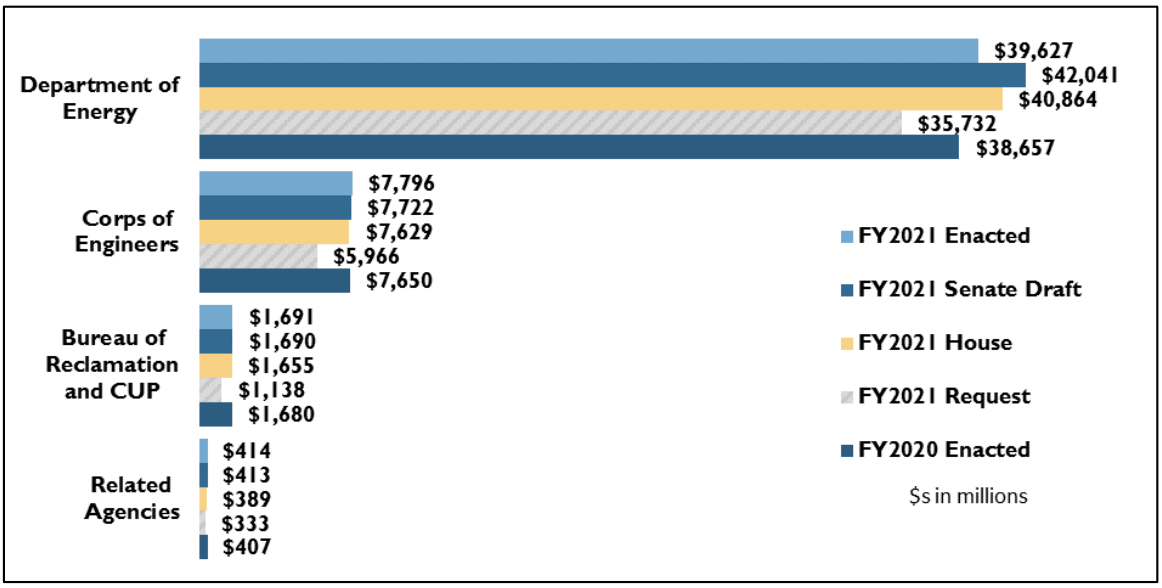
Contacts

Introduction and Overview

The Energy and Water Development and Related Agencies appropriations bill includes funding for civil works projects of the U.S. Army Corps of Engineers (USACE), in Title I; the Department of the Interior's Bureau of Reclamation (Reclamation) and Central Utah Project (CUP), in Title II; the Department of Energy (DOE), in Title III; and a number of independent agencies, including the Nuclear Regulatory Commission (NRC) and the Appalachian Regional Commission (ARC), in Title IV. **Figure 1** compares the major components of the Energy and Water Development appropriations bill from FY2020 through FY2021.

Figure 1. Funding for Major Components of Energy and Water Development Appropriations Bill, FY2020 through FY2021

(excluding emergency supplementals)



Sources: H.R. 133 Explanatory Statement; Senate Appropriations Committee majority draft Explanatory Statement for Energy and Water Development and Related Agencies Appropriations Bill, 2021; H.R. 7617; H.Rept. 116-449; Explanatory Statement for Division C of H.R. 1865, 116th Congress; S.Rept. 116-102; S. 2470; H.R. 2740; FY2021 Budget Appendix; and agency budget justifications. Includes some adjustments; see tables 4-7 for details.

Notes: FY2021 DOE request total does not include asset sales and certain other offsets. Enacted amounts do not include subsequent emergency supplemental appropriations. CUP = Central Utah Project Completion Account. FY2021 House levels exclude emergency appropriations and certain offsets.

President Trump submitted his FY2021 budget request to Congress on February 10, 2020. The budget requests for agencies included in the Energy and Water Development appropriations bill totaled $42.559 billion, including budget offsets. This was $5.764 billion (12%) below the FY2020 enacted Energy and Water Development total of $48.324 billion, not including supplemental appropriations.[1] The House Appropriations Committee approved its FY2021

[1] Most figures for the FY2020 enacted appropriations and FY2021 Administration Request are taken from the House Appropriations Committee report on the Energy and Water Development and Related Agencies Appropriations Bill, 2021 (H.Rept. 116-449), July 15, 2020, the Senate Appropriations Committee majority draft FY2021 explanatory statement,

Energy and Water Development appropriations bill July 13, 2020 (H.R. 7613, H.Rept. 116-449). The Energy and Water bill was included as Division C in the second FY2021 consolidated appropriations bill (H.R. 7617), passed by the House on July 31, 2020. The House-passed bill would have provided total non-emergency energy and water development funding of $49.601 billion, including offsets. This is $1.278 billion (3%) above the FY2020 enacted level and $7.042 billion (17%) above the request. In addition, the House bill included $44.050 billion in emergency FY2021 energy and water appropriations (described below), for a total of $93.651 billion.

Senate Appropriations Committee Chairman Richard Shelby released draft bills and explanatory statements for all 12 regular FY2021 appropriations bills on November 10, 2020, but no subcommittee or committee markups were held. The release of the draft bills was intended to further negotiations on annual appropriations between the House and the Senate.[2] (Hereinafter, the draft of the Energy and Water Development appropriations bill and explanatory statement are referred to as "the Senate Appropriations Committee majority draft bill" and "Senate Appropriations Committee majority draft explanatory statement.") The committee majority's draft bill and explanatory statement for Energy and Water Development appropriations would have provided a total of $51.864 billion, including offsets, according to the comparative statement of new budget authority that is in the explanatory statement. This is $3.540 billion (7%) above the FY2020 enacted level, $9.305 billion (22%) above the request, and $2.262 billion (5%) above the House-passed level, excluding emergency supplemental appropriations.

FY2021 Energy and Water Development funding was enacted by Division D of the Consolidated Appropriations Act, 2021 (P.L. 116-260), signed by the President on December 27, 2020. The enacted Energy and Water appropriations totaled $49.525 billion—$1.201 billion (2%) above the FY2020 enacted level, $6.966 billion (16%) above the Administration request, $77 million (0%) below the House-passed level, and $2.339 billion (5%) below the Senate majority draft, excluding emergency appropriations and scorekeeping adjustments. (Detailed energy and water development appropriations tables for the enacted measure can be found in the Explanatory Statement, at https://www.congress.gov/116/crec/2020/12/21/CREC-2020-12-21.pdf-bk4.)

Administration Request

DOE would have received $35.732 billion under the Administration's FY2021 budget request (excluding offsets)—a decrease of $2.925 billion (8%) from the FY2020 enacted level. The FY2021 request for Energy Efficiency and Renewable Energy (EERE) was $720 million, which is $2.070 billion (74%) below the FY2020 enacted level. This included elimination of grants for home weatherization assistance and state energy programs. Nuclear Energy Research and

---

https://www.appropriations.senate.gov/imo/media/doc/EWRept.pdf, and the Explanatory Statement for H.R. 133, https://www.congress.gov/116/crec/2020/12/21/CREC-2020-12-21.pdf-bk4. House-passed figures are taken from H.R. 7617 and the committee report. Figures for some subaccounts not shown in the House Appropriations Committee report are taken from the DOE FY2021 Congressional Budget Justification, February 2020, https://www.energy.gov/cfo/downloads/fy-2021-budget-justification.

[2] Senate Appropriations Committee, "Committee Releases FY21 Bills in Effort to Advance Process, Produce Bipartisan Results," November 10, 2020, https://www.appropriations.senate.gov/news/committee-releases-fy21-bills-in-effort-to-advance-process-produce-bipartisan-results. See also the statement from Senate Appropriations Committee Vice Chair Patrick Leahy, at https://www.appropriations.senate.gov/news/minority/senate-approps-vice-chair-leahy-statement-on-the-release-of-the-fy-2021-senate-appropriations-bills-.

Development (R&D) would have dropped from $1.493 billion in FY2020 to $1.180 billion in FY2021 (21%), and Fossil Energy R&D would have been reduced from $750 million to $731 million (3%). DOE's Office of Science, which funds a wide range of research, would have received $5.838 billion, down $1.162 billion (17%) from the FY2020 enacted level. Funding for the Advanced Research Projects Agency—Energy (ARPA-E), which received $425 million in FY2020, would have been eliminated and $311 million in prior-year funding rescinded. Environmental Management (waste management and cleanup) was to decline from $7.455 billion in FY2020 to $6.066 billion in FY2021 (down $1.390 billion, or 19%).

The National Nuclear Security Administration (NNSA), the DOE agency responsible for defense-related nuclear activities, was to be increased from $16.705 billion in FY2020 to $19.771 billion in FY2021 (up $3.066 billion, or 18%) by the Administration request. Also proposed for increases were DOE's Office of Electricity (up $5 million, or 3%) and the Office of Cybersecurity, Energy Security, and Emergency Response (up $29 million, or 18%).

The two major water agencies in the Energy and Water Development appropriations bill would have seen funding reductions under the FY2021 budget request. USACE would have declined from $7.650 billion in FY2020 to $5.966 billion in FY2021 (down $1.684 billion, or 22%). Reclamation (separately from CUP) would have been reduced from $1.660 billion in FY2020 to $1.128 billion in FY2021 (down $532 million, or 32%).

Among the independent agencies funded by the bill, the Nuclear Regulatory Commission (NRC) was to receive an increase in total appropriations from $856 million in FY2020 to $863 million in FY2021 (up $8 million, or 1%). NRC's budget is mostly offset by nuclear industry fees, which may vary from year to year; the agency's net appropriation was proposed to decline from $128 million in FY2020 to $123 million in FY2021 (down $5 million, or 4%). Funding for the Appalachian Regional Commission would have decreased from $175 million in FY2020 to $165 million in FY2021 (down $10 million, or 6%). Deeper percentage reductions in appropriations were proposed for smaller regional authorities in the bill: Denali Commission (-51%), Delta Regional Authority (-92%), Northern Border Regional Commission (-97%), and Southeast Crescent Regional Commission (-100%).

House-Passed Bill

The House-passed bill would have largely reversed the funding reductions proposed by the Administration and reduced the Administration's proposed increases for DOE defense programs. DOE appropriations in the House bill totaled $40.864 billion (excluding emergency funding), up $2.207 billion (6%) from FY2020. From the enacted FY2020 levels, funding for EERE would have increased by $60 million (2%), Science would have risen $55 million (1%), ARPA-E would have increased by $10 million (2%), and loan programs were to continue unchanged. Nuclear Energy R&D would have been reduced by $58 million (4%), less than the $313 million reduction sought by the Administration. The bill would have reduced Fossil R&D by $4 million less than the reduction proposed by the Administration. The House bill would have reduced the Administration's proposed $3.066 billion (18%) increase for NNSA to $1.333 billion (8%).

The Administration's proposed FY2021 funding reductions for water development agencies would have been largely reversed under the House-passed bill: regular (non-emergency) appropriations would have decreased by $30 million (2%) for Reclamation and by $21 million (a fraction of a percent) for USACE from their FY2020 enacted levels. For independent agencies funded by the bill, the House bill would have reversed the proposed reductions, mostly calling for level funding or slight increases. The primary exception was the Delta Regional Authority, which would have been reduced by $15 million (50%) from its FY2020 funding level (compared with

the 92% reduction sought by the Administration). The House bill also included first-time funding of $250,000 for the Southwest Border Regional Commission.

Senate Committee Majority Draft

The Senate Appropriations Committee majority draft bill and explanatory statement would have provided $42.041 billion for DOE, $6.309 billion (18%) above the request and $1.178 billion (3%) above the House-passed level, excluding emergency supplementals. Compared with the House-passed levels, total funding for DOE energy programs would have been $206 million (1%) higher under the Senate draft, and defense programs would have been $968 million (4%) higher.

For the water agencies, the Senate committee majority draft would have provided $7.722 billion for USACE, $1.756 (29%) above the request and $93 million (1%) above the House-passed level, excluding emergency supplemental appropriations. Reclamation would have received $1.670 billion, $542 million (48%) above the request and $40 million (2%) above the House-passed level. Independent agencies would have received $413 million, $80 million (24%) above the request and $24 million (6%) above the total approved by the House. The Senate draft did not include startup funding for the Southwest Border Regional Commission.

Emergency Funding

In addition to the regular appropriations described above, Title VI of the House-passed bill included $44.050 billion in emergency FY2021 funding—nearly doubling the bill's total appropriations. These "additional infrastructure investments" were intended "to support the economic recovery from the coronavirus pandemic," according to the House Appropriations Committee report. USACE would have received $17.0 billion, Reclamation would have received $3.0 billion, and DOE would have received $24.050 billion. The emergency spending in Title VI was outside the annual budget caps described below. No such additional emergency spending for energy and water development programs was included in the Senate Appropriations Committee majority draft bill or in the enacted FY2021 energy and water development funding in P.L. 116-240.[3]

The largest amounts of the DOE emergency funding would have gone to EERE ($8.330 billion), of which $3.250 billion was for weatherization (energy efficiency) improvements to low-income housing, $2.250 billion was for energy efficiency and conservation block grants, and $1.025 billion was for electric vehicle infrastructure. Science would have received $6.250 billion in emergency appropriations for upgrades to scientific research facilities. Other DOE programs that were to receive the largest amount of emergency funding included Defense Environmental Cleanup ($2.685 billion), Electricity, for grid modernization ($3.350 billion), Nuclear Energy ($1.250 billion), and Fossil Energy ($1.250 billion).

USACE's emergency appropriations included $10.0 billion for construction and $5.0 billion for operation and maintenance. Limitations on USACE construction projects in various existing statutes would have been waived. Emergency funding for Reclamation included $300 million for WaterSMART grants for water efficiency and infrastructure improvements, $605 million for Indian Water Rights Settlements, and at least $700 million for various efforts in California associated with the California Bay-Delta Restoration Act, the Central Valley Project Improvement Act, and the San Joaquin River Restoration Settlement.

[3] Senate Appropriations Committee majority explanatory statement, p. 1, https://www.appropriations.senate.gov/imo/media/doc/EWRept.pdf.

The House bill specified that funds "designated in this Act by the Congress as being for an emergency requirement" would have become available only if the President "subsequently so designates all such amounts and transmits such designations to the Congress" (Section 4).

Enacted Measure

Division D of the Consolidated Appropriations Act, 2021 (P.L. 116-260) provided $39.627 billion for DOE, which is $970 million (3%) above the FY2020 enacted level, $3.895 billion (11%) above the Administration request, $1.237 billion (3%) below the House level, and $2.414 billion (6%) below the Senate majority draft level. DOE energy programs received $12.445 billion for FY2021, $2.189 billion (15%) below the FY2020 enacted level, with the reduction resulting almost entirely from rescissions of unused loan and loan guarantee funding. NNSA received $19.732 billion for FY2021, $3.028 billion (18%) above the FY2020 enacted level.

USACE received $7.796 billion for FY2021, $146 million (2%) above the FY2020 amount. The Bureau of Reclamation received $1.670 billion, $10 million (1%) more than in FY2020. Independent agencies were appropriated a net total of $414 million for FY2021, an increase of $7 million (2%) from FY2020. Initial funding of $250,000 was provided for the Southwest Border Regional Commission. In contrast to the House-passed bill, no additional emergency appropriations for energy and water development programs were included in the enacted FY2021 funding measure.

Earlier-Year Funding

FY2020 funding was enacted in the FY2020 Energy and Water Development and Related Agencies Appropriations Act on December 19, 2019, as Division C of the Further Continuing Appropriations Act, 2020, which was signed by the President on December 20, 2019 (P.L. 116-94). The enacted measure provided $48.324 billion for Energy and Water programs (including rescissions), $3.663 billion (8%) above the FY2019 funding level (excluding emergency supplemental appropriations) and $10.368 billion (27%) above the Administration request. Funding tables and other details are provided in the explanatory statement submitted with the Further Continuing Appropriations Act, 2020.[4]

Figures for FY2019 exclude emergency supplemental appropriations totaling $17.419 billion provided to USACE and DOE for natural disaster response by the Bipartisan Budget Act of 2018 (P.L. 115-123), signed February 9, 2018. Similarly, the discussion and amounts in this report do not reflect the emergency supplemental appropriations provided in the Additional Supplemental Appropriations for Disaster Relief Act, 2019 (P.L. 116-20) for USACE ($3.258 billion) and Reclamation ($16 million) or Coronavirus Disease 2019 (COVID-19)-related supplemental appropriations (e.g., P.L. 116-136). For more details, see CRS In Focus IF11435, *Supplemental Appropriations for Army Corps Flood Response and Recovery*, by Nicole T. Carter and Anna E. Normand, and CRS Report R45708, *Energy and Water Development: FY2020 Appropriations*, by Mark Holt and Corrie E. Clark.

Budgetary Limits

Congressional consideration of the annual Energy and Water Development appropriations bill is affected by certain procedural and statutory budget enforcement requirements. These consist

[4] Further Consolidated Appropriations Act, 2020, Committee Print of the Committee on Appropriations, U.S. House of Representatives, on H.R. 1865/P.L. 116-94, Legislative Text and Explanatory Statement, January 2020, https://www.govinfo.gov/content/pkg/CPRT-116HPRT38679/pdf/CPRT-116HPRT38679.pdf.

primarily of procedural limits on discretionary spending (spending provided in annual appropriations acts) established in a budget resolution or through some other means, and allocations of this amount that apply to spending under the jurisdiction of each appropriations subcommittee.

Statutory budget enforcement is currently derived from the Budget Control Act of 2011 (BCA; P.L. 112-25). The BCA established separate limits on defense and nondefense discretionary spending. These limits are in effect from FY2012 through FY2021 and are primarily enforced by an automatic spending reduction process called sequestration, in which a breach of a spending limit would trigger across-the-board cuts, known as a sequester, within that spending category.

The BCA's statutory discretionary spending limits were increased for FY2020 and FY2021 by the Bipartisan Budget Act of 2019 (BBA 2019, P.L. 116-37, H.R. 3877), signed by the President August 2, 2019. For FY2021, BBA 2019 sets discretionary spending limits of $671.5 billion for defense funding and $626.5 billion for nondefense funding (the Energy and Water Development Appropriations bill includes both). P.L. 116-136 (§14003) altered the accounting of certain harbor maintenance spending toward the discretionary spending limits.

From the FY2021 discretionary spending limit, the House Appropriations Committee on July 13, 2020, allocated $49.607 billion to the Energy and Water Development Appropriations Subcommittee (H.Rept. 116-443).[5] That limit did not apply to the emergency appropriations in the House-passed FY2021 consolidated funding bills. The Senate Appropriations Committee majority posted draft FY2021 subcommittee allocations on November 10, 2020, including $51.752 billion for energy and water development, which is consistent with the text within the explanatory statement but different from the comparative statement of new budget authority at the end of the explanatory statement.[6] The enacted Energy and Water Development appropriations measure for FY2021 totaled $49.525 billion, excluding scorekeeping adjustments. (For more information, see CRS Insight IN11148, *The Bipartisan Budget Act of 2019: Changes to the BCA and Debt Limit*, by Grant A. Driessen and Megan S. Lynch, and CRS Report R44874, *The Budget Control Act: Frequently Asked Questions*, by Grant A. Driessen and Megan S. Lynch.)

Funding Issues and Initiatives

Several issues drew particular attention during congressional consideration of Energy and Water Development appropriations for FY2021. The issues described in this section—listed approximately in the order the affected agencies appear in the Energy and Water Development bill—were selected based on total funding involved, percentage of proposed increases or decreases, amount of congressional debate engendered, and potential impact on broader public policy considerations. Substantial controversy arose during House markups and floor debate about the bill's $44.050 billion in emergency spending under Title VI (Division C) in response to the ongoing COVID-19 outbreak; those provisions were dropped, but the Consolidated Appropriations Act, 2021, included $900 billion of emergency COVID relief in Divisions M and N. (For information on COVID effects, see CRS Insight IN11300, *COVID-19: Potential Impacts on the Electric Power Sector*, by Ashley J. Lawson.)

[5] The House and Senate Appropriations Committees make subcommittee allocations pursuant to Section 302(b) of the Congressional Budget Act of 1974 (P.L. 93-344).

[6] Senate Appropriations Committee majority, *2021 Original Senate Allocation*, https://www.appropriations.senate.gov/imo/media/doc/FY21%20302(b)%20Subcommittee%20Allocations.pdf.

Army Corps of Engineers and Reclamation Budgets

For USACE, the Trump Administration requested $5.966 billion for FY2021, which is $1.684 billion (22%) below the FY2020 appropriation. The request included no funding for initiating new studies and construction projects (referred to as *new starts*). The FY2021 request would have limited funding for ongoing navigation and flood risk-reduction construction projects to those whose benefits are at least 2.5 times their costs, or projects that address safety concerns. Many congressionally authorized USACE projects do not meet that standard. The House-passed energy and water funding measure for FY2021 provided $7.629 billion for USACE, plus $17.0 billion in emergency appropriations, and included funds for seven new starts for studies and seven new starts for construction projects.[7] The Senate Appropriations Committee majority draft bill for FY2021 would have provided $7.722 billion for USACE and included funds for nine new starts for studies and seven new starts for construction projects.

The Trump Administration also sought to transfer the Formerly Utilized Sites Remedial Action Program (FUSRAP) from USACE to DOE, a proposal included in prior budget requests that Congress has not approved. For Reclamation (not including CUP), the FY2021 request would have reduced funding by $532 million (32%) from the FY2020 level, to $1.128 billion. The House-passed bill included $1.630 billion for Reclamation, while the Senate Appropriations Committee majority draft would have provided $1.670 billion.

The Trump Administration did not request FY2021 funding for USACE's Water Infrastructure Finance and Innovation Act (WIFIA) program. Congress authorized USACE's WIFIA in 2014 (Title V, Subtitle C of P.L. 113-121).[8] USACE through WIFIA is authorized to provide credit assistance in the form of secured or direct loans for a range of water resource projects.[9] H.Rept. 116-449 indicated support for USACE's activities to develop its WIFIA, and in staying informed about its development;[10] no appropriations were provided specifically for USACE's WIFIA in H.R. 7617. The Senate Appropriations Committee majority draft included a new USACE account for the agency's WIFIA and would have appropriated $25 million to the new account.[11] The draft bill would have required $22.8 million of the funds to be used for WIFIA assistance to nonfederal

[7] House Committee on Appropriations, Report on Energy and Water Development and Related Agencies Appropriations Bill, 2021, H.Rept. 116-449, p. 16. For more on environmental infrastructure authorities, see CRS In Focus IF11184, *Army Corps of Engineers: Environmental Infrastructure Assistance*, by Anna E. Normand.

[8] USACE has elected to call its WIFIA program the Civil Works Infrastructure Financing Program (CWIFP); this report refers to it as WIFIA, to remain consistent with legislative text.

[9] USACE's WIFIA is authorized to assist eligible projects that have the following purposes: reduction of riverine or coastal storm flood damage; restoration of aquatic ecosystems; improvement of the inland and intracoastal waterways navigation system; improvement of navigation of a coastal inland harbor of the United States, including channel deepening and construction of associated general navigation features; or a combination of purposes that are supported by the USACE's and the Environmental Protection Agency's (EPA's) WIFIA programs. (For more information, see 33 U.S.C. §3905.) USACE has clarified that dam and levee safety projects fall within WIFIA's eligible project purposes.

[10] House Committee on Appropriations, Report on Energy and Water Development and Related Agencies Appropriations Bill, 2021, H.Rept. 116-449, p. 73. In the report, the committee included language that would direct the USACE to brief the committee on the budget scoring challenges related to USACE's WIFIA program. Some of the scoring challenges relate to the scoring of federal projects and projects related to federal assets.

[11] The authorization of appropriations for USACE's WIFIA expired in FY2019 (see 33 U.S.C. §3912). In contrast to the Environmental Protection Agency's WIFIA program, which was also authorized in 2014 and provided its first WIFIA assistance in 2018, USACE's WIFIA program has been under development (using USACE General Expenses appropriations), but was not operational as of the start of FY2021.

dam owners for dam safety projects,[12] and $2.2 million for USACE administrative expenses to carry out the program.

The Consolidated Appropriations Act, 2021, created a new account for USACE's WIFIA program, as recommended by the Senate Appropriations Committee majority draft, and appropriated $14.2 million to it. Of the total, $12.2 million is specifically for nonfederal dam owners for dam safety projects, with the remaining $2 million for USACE administrative expenses to carry out the program. Total FY2021 enacted appropriations for USACE were $7.80 billion (31% above the FY2021 request and 2% above the FY2020 enacted amount). The Administration's proposed transfer of the FUSRAP radiological site cleanup program to DOE was not approved. Following enactment of the FY2021 appropriations measure, USACE issued its Work Plan for FY2021 programs, projects, and activities on January 19, 2021.[13]

For more details, see CRS In Focus IF11462, *Army Corps of Engineers: FY2021 Appropriations*, by Anna E. Normand and Nicole T. Carter, CRS In Focus IF11465, *Bureau of Reclamation: FY2021 Appropriations*, by Charles V. Stern, CRS Report R46320, *U.S. Army Corps of Engineers: Annual Appropriations Process and Issues for Congress*, by Anna E. Normand and Nicole T. Carter, and CRS In Focus IF11193, *WIFIA Program: Background and Recent Developments*, by Elena H. Humphreys.

Power Marketing Administration Proposals

DOE's FY2021 budget request included three spending proposals, none of which were enacted, related to the Power Marketing Administrations (PMAs)—Bonneville Power Administration (BPA), Southeastern Power Administration (SEPA), Southwestern Power Administration (SWPA), and Western Area Power Administration (WAPA). PMAs sell the power generated by various federal dams. The Trump Administration proposed to divest the assets of the three PMAs that own transmission infrastructure: BPA, SWPA, and WAPA.[14] These assets consist of thousands of miles of high voltage transmission lines and hundreds of power substations. The budget request projected that mandatory spending savings from the sale of these assets would total approximately $4.1 billion over a 10-year period.[15] The budget request proposed to repeal the borrowing authority for WAPA's Transmission Infrastructure Program, which facilitates the delivery of renewable energy resources.

[12] That is, although the WIFIA authority provides for USACE to assist a range of water resource projects, the draft bill would have limited the FY2021 WIFIA assistance to nonfederal dam safety. The draft explanatory statement accompanying the bill provided additional direction to USACE on development of the program, including the types of eligible projects. For more information, see Senate Committee on Appropriations majority draft explanatory statement, November 10, 2020, p. 59.

[13] USACE, "U.S. Army Corps of Engineers Releases Work Plan for Fiscal 2021 Civil Works Appropriations," January 19, 2021, https://www.usace.army.mil/Media/News-Releases/News-Release-Article-View/Article/2476138/us-army-corps-of-engineers-releases-work-plan-for-fiscal-2021-civil-works-appro/.

[14] This proposal was also included in the Trump Administration's *Delivering Government Solutions in the 21st Century: Reform Plan and Reorganization Recommendations*, June 21, 2018, pp. 66-67, https://www.whitehouse.gov/wp-content/uploads/2018/06/Government-Reform-and-Reorg-Plan.pdf. Total 10-year savings were estimated at $9.5 billion, possibly including the proposed cancellation of WAPA borrowing authority. Mandatory spending is provided by permanent law outside the annual appropriations process; for details, see CBO, "What is the difference between mandatory and discretionary spending?," https://www.cbo.gov/content/what-difference-between-mandatory-and-discretionary-spending.

[15] Office of Management and Budget, *A Budget for America's Future: Major Savings and Reforms*, Fiscal Year 2021, p. 138, https://www.whitehouse.gov/wp-content/uploads/2020/02/msar_fy21.pdf.

The FY2021 budget also proposed eliminating the statutory requirement that PMAs limit rates to amounts necessary to recover only construction, operations, and maintenance costs. The budget proposed that the PMAs instead transition to a market-based approach to setting rates. The Administration estimated that this proposal would yield $7.4 billion in new revenues over 10 years.[16] The budget also called for repealing $3.25 billion in borrowing authority provided to WAPA for transmission projects enacted under the American Recovery and Reinvestment Act of 2009 (P.L. 111-5). The proposal was estimated to save $500 million over 10 years.[17]

The Administration had made all of these proposals in previous years. To take effect, they would have needed to be enacted in authorizing legislation, and no congressional action was taken on them. The proposals were opposed by groups such as the American Public Power Association and the National Rural Electrical Cooperative Association, and they have been the subject of opposition letters to the Administration from several regionally based bipartisan groups of Members of Congress. PMA reforms have been supported by some policy research institutes, such as the Heritage Foundation.

For further information, see CRS Report R45548, *The Power Marketing Administrations: Background and Current Issues*, by Richard J. Campbell.

Proposed Termination of Energy Efficiency Grants

The FY2021 budget request proposed to terminate both the DOE Weatherization Assistance Program and the State Energy Program (SEP), but Congress continued to fund the programs in FY2021. The Weatherization Assistance Program provides formula grants to states to fund energy efficiency improvements for low-income housing units to reduce their energy costs and save energy. The SEP provides grants and technical assistance to states for planning and implementation of their energy programs. Both the weatherization and SEP programs are under DOE's Office of Energy Efficiency and Renewable Energy (EERE). The weatherization program received $305 million and SEP received $63 million for FY2020, after also having been proposed for elimination in that year's budget request, as well as in FY2019 and FY2018. According to DOE, the proposed elimination of the grant programs was "due to a departmental shift in focus away from deployment activities and towards early-stage R&D."[18]

The House-passed bill included funding for energy efficiency grants within Title III and Title VI. Within Title III, the bill provided for small increases in weatherization and SEP grants over their FY2020 enacted levels. Title VI of the bill would have provided emergency supplemental funding: $3.250 billion for weatherization grants, $730 million for SEP grants, and $2.250 billion for Energy Efficiency and Conservation Block Grants (EECBGs). The EECBG program, which is authorized by the Energy Independence and Security Act (EISA, P.L. 110-140), was funded at $3.2 billion under the American Recovery and Reinvestment Act (ARRA, P.L. 111-5). ARRA also provided supplemental funding for the Weatherization Assistance Program ($5 billion) and SEP ($3.1 billion).

The Senate Appropriations Committee majority draft bill and explanatory statement included small funding increases for energy efficiency grants: $305 million for weatherization grants and $62.5 million for SEP grants. The FY2021 enacted funding measure provided $315 million for

[16] Ibid., p. 139.

[17] Ibid., p. 140.

[18] DOE, FY2021 Congressional Budget Request, Budget in Brief, p. 20, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

weatherization grants and $62.5 million for SEP grants, with none of the emergency supplemental funding passed by the House.

Proposed Reductions in Energy R&D

Appropriations for applied R&D on energy efficiency, renewable energy, nuclear energy (NE), and fossil energy (FE) would have been reduced from $4.650 billion in FY2020 to $2.670 billion (43%) under the Administration's FY2021 budget request.[19] Major proposed reductions included bioenergy technologies (-83%), vehicle technologies (-81%), natural gas technologies (-71%), advanced manufacturing (-75%), building technologies (-79%), wind energy (-79%), solar energy (-76%), geothermal technologies (-76%), and nuclear fuel cycle R&D (-39%), although some programs would have been increased, such as energy storage (+49%) and advanced coal energy systems (+115%). The House voted to maintain nearly level funding for energy R&D, and, in addition, to provide approximately $2.9 billion in emergency funding (Title VI) for energy research, demonstration, and commercialization projects. The Senate Appropriations Committee majority draft bill included nearly level funding for energy R&D. Enacted FY2021 appropriations for energy R&D totaled $4.743 billion, 2% above the FY2020 enacted level.

The Administration said its proposed reductions would have primarily affected the later stages of energy research, which tend to be the most costly. "The Budget focuses DOE resources toward early-stage R&D, where the Federal role is strongest, and reflects an increased reliance on the private sector to fund later-stage research, development, commercialization, and deployment of energy technologies," according to the FY2021 DOE request.[20] However, the explanatory statement for the Consolidated Appropriations Act, 2021, said, "The Department is directed to maintain a diverse portfolio of early-, mid-, and latestage research, development, and market transformation activities in each applied energy research and development program office."

The Administration had also proposed similar reductions in previous years but they were not approved by Congress.

Renewable Energy Grid Integration and Storage Initiatives

The explanatory statement for the Consolidated Appropriations Act, 2021, provided $40 million in crosscutting funding for Renewable Energy Grid Integration, which would "facilitate the oversight of grid integration activities" among DOE's solar, wind, water power, and geothermal R&D programs. Within available funds, the explanatory statement provided $10 million for "development and demonstration of an 'energyshed' management system that addresses a discrete geographic area in which renewable sources currently provide a large portion of electric energy needs, where grid capacity constraints result in curtailment of renewable generation, and with very substantial existing deployment of interactive smart meters." Similar language was included in the Senate Appropriations Committee draft.[21]

DOE was directed by the explanatory statement to develop "a crosscutting research and development roadmap and implementation plan" to "be focused on reducing costs and improving the performance of a diverse set of grid-scale storage technologies to meet industry needs, improve reliability and environmental performance of the electricity grid, and reduce greenhouse

[19] Additional energy activities that are not included in this total include state energy efficiency and weatherization grants, energy security programs, and electricity programs. The Office of Science and ARPA-E are not included.

[20] DOE, *FY2021 Congressional Budget Request, Budget in Brief*, p. 17, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

[21] Senate Appropriations Committee majority draft explanatory statement, p. 92.

gas emissions." Both the House committee report and Senate committee draft explanatory statement also supported crosscutting energy storage activities.

Nuclear Waste Management Funding

The Trump Administration's FY2021 budget request did not include new funding for a proposed underground nuclear waste repository at Yucca Mountain, NV, after the Administration's funding requests for the repository were not approved by Congress in the previous three fiscal years. Those requests had included funding for DOE to pursue an NRC license for the repository and for NRC to consider DOE's license application. Although no FY2021 funding was requested for licensing and developing Yucca Mountain, the Administration sought $27.5 million to develop nuclear waste central interim storage capacity. "Funding is primarily dedicated to performing activities that would lay the groundwork necessary to ensure near-term deployment of interim storage to ensure safe and effective consolidation and temporary storage of nuclear waste," according to DOE's budget justification. Funding for the program was to come from the Nuclear Waste Fund, which holds fees and interest paid by the nuclear power industry for waste management.[22] The House approved the Administration's request but specified that only $7.5 million come from the Nuclear Waste Fund.

The Senate Appropriations Committee majority draft bill also included $27.5 million (but within Nuclear Energy rather than as a separate account) for the development of consolidated interim nuclear spent fuel storage facilities. Up to $10 million of that amount could have been used to contract for spent fuel management, including storage by a private company. The Senate draft also included an authorization (Sec. 306) for DOE to conduct a pilot program for interim spent nuclear fuel storage at a site selected with the consent of the host state, local governments, and Indian tribes. Similar language had been included in previous Senate Appropriations Committee Energy and Water Development appropriations bills but not enacted.

The Consolidated Appropriations Act, 2021 provided $27.5 million for Nuclear Waste Disposal, of which $20 million was directed to be used for interim storage and $7.5 million (from the Nuclear Waste Fund) for Nuclear Waste Fund oversight activities. The Senate draft proposal for an interim storage pilot program was not enacted. For more background, see CRS Report RL33461, *Civilian Nuclear Waste Disposal*, by Mark Holt.

Advanced Reactor Demonstrations

A new, $230 million sub-account for an Advanced Reactor Demonstration Program within the DOE Nuclear Energy account was included in the explanatory statement for the FY2020 enacted appropriations measure. Of that funding, $160 million was provided for DOE to begin two advanced nuclear reactor demonstration projects, with a cost-share of at least 50% from nonfederal sources. Another $30 million was provided for grants to reduce the technical risk of two-to-five additional reactor demonstration proposals, with a nonfederal cost-share of at least 20%. DOE announced awards totaling $160 million for two advanced reactor demonstrations on October 13, 2020—a molten salt reactor and a high-temperature gas reactor.[23] The FY2021 DOE

[22] DOE, *Budget in Brief*, February 2020, p. 38, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

[23] DOE, Office of Nuclear Energy, "U.S. Department of Energy Announces $160 Million in First Awards under Advanced Reactor Demonstration Program," news release, October 13, 2020, https://www.energy.gov/ne/articles/us-department-energy-announces-160-million-first-awards-under-advanced-reactor.

request included no further funding for reactor demonstrations but called for $20 million to continue R&D related to the program. The budget request proposed to formally establish the Versatile Test Reactor (VTR) as a DOE construction project and more than quadruple its funding to $295 million. The VTR would be a new reactor to provide fast (high energy) neutrons for testing advanced reactor fuels and materials. DOE estimates the project's total construction cost at between $3 billion and $6 billion, with completion ranging from 2026 to 2030.[24]

The House approved $240 million for Advanced Reactor Demonstrations in FY2021, $10 million above the FY2020 enacted amount. However, the House-passed bill reduced VTR construction funding from the requested amount to $65 million, the same as the FY2020 appropriation for preconstruction activities.

The Senate Appropriations Committee majority draft explanatory statement recommended $280 million for Advance Reactor Demonstrations "to ensure that the program can continue in an accelerated manner." The Senate majority draft included $45 million for the VTR, while noting, "The Committee is concerned that the Department is proceeding with plans for the VTR without having secured commitments from private companies or foreign governments for monetary and in-kind contributions."[25]

The Consolidated Appropriations Act, 2021, provided $250 million for the Advanced Reactor Demonstration Program. That amount includes $80 million apiece for two cost-shared demonstration projects, $40 million for cost-shared grants to reduce the technological risk of future demonstrations, $30 million for the National Reactor Demonstration Center, $15 million for regulatory development, and $5 million for nonproliferation safeguards. The VTR project was appropriated $45 million, with a requirement in the explanatory statement that DOE give the Appropriations Committees "a plan for executing the Versatile Test Reactor project via a public-private partnership with an option for a payment-for-milestones approach."

Establishment of Uranium Reserve

The FY2021 budget request for the DOE Office of Nuclear Energy included $150 million to establish a Uranium Reserve. This initiative called for DOE to purchase uranium from domestic uranium producers and have it converted to uranium hexafluoride (a necessary step in making nuclear reactor fuel) by a domestic conversion facility. The Consolidated Appropriations Act, 2021, provided $75 million for the Uranium Reserve.

According to DOE, this stockpile of uranium would be available for nuclear power operators in the event of a civilian nuclear fuel market disruption and provide a source of U.S.-origin uranium for defense purposes. "Establishing a reserve is an urgent step needed in response to an overreliance on imported uranium product that has undermined U.S. energy security and impacted U.S. fuel supply capabilities," according to the DOE budget justification. However, the justification notes that, for the newly stockpiled uranium, "no immediate national security need has been identified."[26] The proposed government purchases are also intended to address "near-term challenges to the production and conversion of domestic uranium," which are currently

[24] Thomas J. O'Connor, VTR Program Director, DOE Office of Nuclear Energy, "Versatile Test Reactor Update," March 28, 2019, https://www.energy.gov/sites/prod/files/2019/04/f61/VTR%20NEAC%20Rev%202%20%28003%29_1.pdf.

[25] Senate Committee on Appropriations majority draft explanatory statement, November 10, 2020, p. 107.

[26] DOE, Budget in Brief, February 2020, p. 39, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

under economic stress, according to the justification. "Subsequent support will be considered as deemed necessary across a 10-year period as the government and private sector work to reestablish US technology and market share," according to a report released April 23, 2020, by the Administration's Nuclear Fuel Working Group (NFWG).[27]

The House-passed bill provided no funding for the proposed Uranium Reserve. "The Department has been unable to provide specific information about how it would implement the program, including in congressional justifications, briefings, and in responses to questions from the Committee about how the funds would be spent, including the process for the purchase, conversion, or sale of uranium in a reserve," according to the Appropriations Committee report. Instead, the committee directed DOE within 180 days after enactment to provide a detailed plan for establishing the Uranium Reserve.[28]

The Senate Appropriations Committee majority draft bill included $120 million for the Uranium Reserve, plus $30 million within DOE's Defense Nuclear Nonproliferation accounts. The draft explanatory statement directed DOE to "provide a specific program plan for executing funds recommended for this activity as well as plans to consolidate this program with other existing uranium management activities within the Department."[29]

The Consolidated Appropriations Act, 2021, did not provide the Trump Administration's requested $150 million for the Uranium Reserve within DOE energy programs but instead appropriated $75 million for the program within the NNSA Weapons Activities account. The explanatory statement directed NNSA to submit a Uranium Reserve program plan to the House and Senate Appropriations Committees.

U.S. uranium production in calendar year 2019 was the lowest since before 1949, according to the Energy Information Administration. As of the fourth quarter of 2019, EIA reported that three domestic in-situ uranium plants (solution mining operations in which a solvent is pumped through underground ore bodies to recover uranium) were operating and that three domestic conventional uranium mills were on standby. Two domestic uranium producers petitioned the Department of Commerce (DOC) in 2018 to investigate foreign uranium imports under Section 232 of the Trade Expansion Act of 1962 (19 U.S.C. §1862). DOC subsequently recommended presidential action to restrict imports, but President Trump did not concur.[30] Nonetheless, the Trump Administration expressed significant concerns regarding national security and responded by establishing the NFWG. The DOE FY2021 budget justification called the Uranium Reserve initiative "consistent with the priorities" of the NFWG and said it would "directly support the operation of at least two U.S. uranium mines and the reestablishment of active domestic conversion capabilities" and was "not designed to replace or disrupt market mechanisms."[31]

For more information, see CRS In Focus IF11505, *Uranium Reserve Program Proposal: Policy Implications*, by Lance N. Larson.

[27] DOE, "Strategy to Restore American Nuclear Energy Leadership," news release, April 23, 2020, https://www.energy.gov/strategy-restore-american-nuclear-energy-leadership.

[28] House Committee on Appropriations, Report on Energy and Water Development and Related Agencies Appropriations Bill, 2021, H.Rept. 116-449, July 15, 2020, p. 114.

[29] Senate Appropriations Committee majority draft explanatory statement, p. 108.

[30] White House, "Memorandum on the Effect of Uranium Imports on the National Security and Establishment of the United States Nuclear Fuel Working Group," July 12, 2019, https://www.whitehouse.gov/presidential-actions/memorandum-effect-uranium-imports-national-security-establishment-united-states-nuclear-fuel-working-group.

[31] Ibid.

Strategic Petroleum Reserve Operations

The Strategic Petroleum Reserve (SPR)—administered, maintained, and operated by DOE—includes both a crude oil reserve and a refined petroleum product reserve. These reserves provide standby and emergency petroleum stocks that DOE can draw down and sell in the event of a domestic or international oil supply disruption. Most SPR stocks are in the form of crude oil contained in underground storage caverns—owned and operated by the federal government—located in Texas and Louisiana. These crude oil stocks are near oil refining, pipeline, and port infrastructure in the U.S. Gulf Coast region. As of March 2021, standby SPR crude oil stocks totaled approximately 638 million barrels.[32] The SPR also includes a 1 million barrel northeast gasoline supply reserve (NGSR) that contains refined petroleum products held in leased commercial storage facilities located in the New York harbor area, the Boston area, and South Portland, ME.

DOE's FY2021 budget request included appropriations for two SPR budget accounts: (1) Strategic Petroleum Reserve ($187 million), which funds management, operations, and maintenance activities, and (2) SPR Petroleum Account ($0), which funds the acquisition, transportation, and injection of petroleum products. One notable change proposed in DOE's budget request was to disestablish the NGSR, sell all refined petroleum product, transfer $19 million to the SPR Petroleum Account, transfer additional proceeds to the general fund, and eliminate annual NGSR leasing costs.

During FY2020, following oil market disruptions and price volatility related to the COVID-19 pandemic, DOE executed some unplanned efforts that required using available SPR Petroleum Account funds. Some of these efforts included an exchange-for-storage solicitation and a $5 million crude oil purchase.[33] In 2021, DOE is required to draw down and sell at least 10 million barrels of crude oil as mandated by previously enacted legislation (P.L. 114-74 and P.L. 115-141) and possibly more should a suspended FY2020 sale occur in FY2021.[34] Expenses associated with transporting and delivering mandated sales to buyers are paid for by SPR Petroleum Account funds. DOE's budget request estimates FY2021 drawdown costs of $7.5 million.

Neither the House-passed bill nor the Senate Appropriations Committee majority draft bill approved DOE's request to disestablish the NGSR. However, both bills did contain language to relax presidential finding criteria for selling, during FY2021, refined petroleum product stored in the NGSR. Proceeds from such a sale would be deposited into the SPR Petroleum Account. Whether such a sale might occur during FY2021 is uncertain and would depend on regional petroleum-product market conditions and the Administration's desire to draw down and sell NGSR inventories.

For the Strategic Petroleum Reserve budget account, the House-passed bill and Senate draft bill included $195 million and $187 million, respectively. For the SPR Petroleum Account, the House bill and Senate draft would have appropriated $7.5 million and $1 million, respectively.

The Consolidated Appropriations Act, 2021, provided $188 million for the SPR budget account and $1 million for the Petroleum Account, for a total of $189 million. The offsets requested by the

[32] Energy Information Administration, "Crude Oil, SPR," March 5, 2021, https://www.eia.gov/dnav/pet/PET_STOC_WSTK_A_EPC0_SAS_MBBL_W.htm.

[33] For additional information, see CRS Insight IN11373, *Strategic Petroleum Reserve: Recent Developments*, by Phillip Brown.

[34] For additional information about congressionally required SPR oil sales, see *Strategic Petroleum Reserve: Mandated and Modernization Sales*, by Phillip Brown, a congressional distribution memo available to congressional clients by request from the author.

Administration were not approved, nor was the proposal to eliminate the NGSR. The enacted measure included a provision similar the House and draft Senate majority bills to relax the criteria—requiring a presidential finding of just a regional supply shortage versus a domestic or international supply shortage—for selling refined petroleum products from the NGSR during FY2021 (Division D, Section 305).

Table 1. SPR Budget Accounts: Comparison of FY2021 Budget Request, House Bill, and Senate Appropriations Committee Majority Draft Bill, and Enacted Measure

(dollars in millions)

		Budget Request	House Bill	Senate Committee Majority Draft Bill	FY2021 Enacted
(A)	Strategic Petroleum Reserve	187.1	195.0	187.1	188.0
(B)	SPR Petroleum Account	0	7.5	1.0	1.0
	Budget Offset and Transfer: Refined Product Sales				
(C)	Sell Northeast Gasoline Supply Reserve	-87.0	N/A	N/A	N/A
(D)	Transfer to SPR Petroleum Account	19.0	N/A	N/A	N/A
(E)	Net budget offset (C + D)	-68.0	N/A	N/A	N/A
(F)	Summation of Accounts and Offset (A + B + E)	119.1	202.5	188.1	189.0

Source: CRS analysis of DOE's FY2021 budget request, House-passed bill, and Senate Appropriations Committee majority draft bill and explanatory statement, and P.L. 116-240 and explanatory statement.

Notes: Net budget offset in DOE's FY2021 budget request would be transferred to the general fund of the Treasury. N/A = not applicable.

Proposed Termination of Energy Loans and Loan Guarantees

The FY2021 budget request called for halting further loans and loan guarantees under DOE's Advanced Technology Vehicles Manufacturing (ATVM) Loan Program and the Title 17 Innovative Technology Loan Guarantee Program. Similar proposals to eliminate the programs in FY2018 through FY2020 were not enacted. The FY2021 budget request would also have halted further loan guarantees under DOE's Tribal Energy Loan Guarantee Program, a proposal that also was not approved by Congress in previous years. Under the FY2021 budget proposal, DOE would have received $3 million (offset by fees) to administer its existing portfolio of loans and loan guarantees. Unused prior-year authority, or ceiling levels, for loan guarantee commitments would have been rescinded, as well as $170 million in unspent appropriations to cover loan guarantee "subsidy costs" (which are primarily intended to cover potential program losses). The Consolidated Appropriations Act, 2021, provided funds to continue administering all the energy loan and loan guarantee programs, although it rescinded $392 million of previously appropriated emergency funding for a temporary Title XVII loan guarantee authority and $1.9 billion of emergency funds for the ATVM direct loan program. The House-passed bill and the Senate committee majority draft also included funds to continue administering the loan and loan guarantee programs.

Artificial Intelligence and Quantum Information Science Initiatives

DOE's FY2021 budget justification emphasized the importance of the Office of Science's crosscutting research on quantum information science (QIS) and artificial intelligence (AI) in supporting "U.S.-based leadership in microelectronics."[35] The FY2021 request included $237 million for QIS and $125 million for AI, plus $12 million requested by NNSA in support of QIS research. The DOE Office of Science's funding for QIS has grown in the past five years, from $6 million in FY2017 to $195 million in FY2020—with a further 21% increase sought for FY2021. The funding request was spread across six Office of Science program areas, mostly in Advanced Scientific Computing Research ($86 million) and Basic Energy Sciences ($72 million).[36] DOE established the Artificial Intelligence and Technology Office (AITO) in September 2019 to coordinate AI activities. The FY2021 DOE request included a new appropriations account for AITO, which was to receive $5 million—nearly double the FY2020 funding level for AI coordination, which had been included in the Departmental Administration account.

The House-passed bill provided for $235 million for quantum information science, about the same as the request, "including not less than $120,000,000 for research and not less than $100,000,000 for up to five National Quantum Information Science Research Centers," according to the House Appropriations Committee report. The House bill included funding of up to $125 million for AI and machine learning, similar to the Administration request. In addition, Title VI included emergency supplemental funding of $75 million for equipment and infrastructure for the QIS Research Centers.

The Senate Appropriations Committee majority draft explanatory statement recommended $271 million from DOE Science programs for QIS, including the five QIS research centers. The Senate draft also included at least $120 million from DOE Science programs for AI and machine learning, with "Advanced Scientific Computing Research to take a lead role."[37]

The Consolidated Appropriations Act, 2021, provided at least $245 million for "the Office of Science's coordinated and focused research program in quantum information science." Within those available funds, $125 million was provided for five National Quantum Information Science Research Centers. While not creating the requested new AITO account, the FY2021 enacted measure provided at least $100 million for "Artificial Intelligence and Machine Learning capabilities across the Office of Science Programs," according to the explanatory statement.

QIS, including quantum computing, builds on the principles governing the smallest particles of matter and energy to obtain and process information in ways that cannot be achieved based on classical physics principles. AI generally involves computerized systems that work and react in ways commonly thought to require intelligence, such as solving complex problems in real-world situations. AI is often considered to include machine learning as a subfield. DOE's budget documents described the QIS and AI program areas as "fundamental for the Industries of the Future Initiative" and the National Quantum Initiative, which are intended to advance U.S. industrial and scientific leadership.[38] Additionally, the National Security Commission on AI

[35] Secretary of Energy Dan Brouillette, Testimony Before the Senate Appropriations Committee, Subcommittee on Energy and Water Development, March 4, 2020, https://www.appropriations.senate.gov/imo/media/doc/03.04.20%20—%20Brouillette%20Testimony.pdf.

[36] Email from Robert Tuttle, DOE Office of Congressional and Intergovernmental Affairs, April 16, 2020.

[37] Senate Appropriations Committee majority draft explanatory statement, p. 116.

[38] Ibid., and DOE, *FY2021 Congressional Budget Justification*, vol. 4, February 2020, p. 150, https://www.energy.gov/

recommended in March 2020 that federal AI funding be doubled, including $300 million for DOE.[39]

For more information, see CRS Report R45409, *Quantum Information Science: Applications, Global Research and Development, and Policy Considerations*, by Patricia Moloney Figliola, CRS In Focus IF10608, *Overview of Artificial Intelligence*, by Laurie A. Harris, and CRS Video WVB00311, *Artificial Intelligence: An Overview of Technologies and Issues for Congress*, by Laurie A. Harris.

International Thermonuclear Experimental Reactor and Fusion Research Grant Funding

The Administration's FY2021 request for DOE's Fusion Energy Sciences (FES) program under the Office of Science included $107 million for the U.S. contribution to the International Thermonuclear Experimental Reactor (ITER), which is under construction in France by a multinational consortium. "ITER will be the first fusion device to maintain fusion for long periods of time" and is to lay the technical foundation "for the commercial production of fusion-based electricity," according to the consortium's website.[40] The FY2021 DOE appropriation request, 56% below the FY2020 enacted level of $242 million (which had been an 83% increase from FY2019), included funding to pay for components supplied by U.S. companies for the project, such as central solenoid superconducting magnet modules.

The House-passed bill included $260 million for the U.S. contribution to ITER, "of which not less than $100,000,000 is for in-cash contributions," according to the Appropriations Committee report. An additional $65 million for ITER was to be provided by Title VI as an emergency supplemental. The Senate committee majority draft recommended $211 million for the U.S. contribution to ITER, including at least $54 million for in-cash contributions.

The Consolidated Appropriations Act, 2021, included $242 million for the U.S. contribution to ITER, the same as in FY2020, including $60 million in cash. The emergency supplemental funding passed by the House was not enacted. The explanatory statement directed DOE to give the House and Senate Appropriations Committees a "performance baseline for the entire project" within 180 days after enactment.

ITER has long attracted congressional concern about management, schedule, and cost. The United States is to pay 9% of the project's construction costs, including contributions of components, cash, and personnel. Other collaborators in the project include the European Union, Russia, Japan, India, South Korea, and China. The total U.S. share of the cost was estimated in 2015 to be between $4.0 billion and $6.5 billion, up from $1.45 billion to $2.2 billion in 2008. Some private-sector fusion companies contend that the technologies they are pursuing could produce practical fusion power sooner and less expensively than ITER.[41] The FY2021 FES budget request included $4 million, the same as in FY2020, for the Innovation Network for Fusion Energy (INFUSE) program, which provides private-sector fusion companies with access

sites/prod/files/2020/03/f72/doe-fy2021-budget-volume-4_0.pdf.

[39] National Security Commission on Artificial Intelligence, First Quarter Recommendations, March 2020, p. 9, https://sites.google.com/nscai.gov/home/reports.

[40] ITER website, https://www.iter.org/.

[41] Bourzac, Katherine, "Fusion Start-Ups Hope to Revolutionize Energy in the Coming Decades," *Chemical and Engineering News*, August 6, 2018, https://cen.acs.org/energy/nuclear-power/Fusion-start-ups-hope-revolutionize/96/i32.

to DOE national laboratory facilities and expertise.[42] ARPA-E (below) also is funding some alternative fusion concepts.[43] The House bill provided $5 million for INFUSE, according to the committee report. The Senate committee majority draft recommended $4 million for INFUSE, the same as the enacted amount.

Proposed Elimination of Advanced Research Projects Agency—Energy

The Trump Administration's FY2021 budget proposed to eliminate the Advanced Research Projects Agency—Energy and rescind $332 million of the agency's unobligated balances. ARPA-E funds research on technologies that are determined to have potential to transform energy production, storage, and use.[44] According to the budget request, DOE would have ended ARPA-E "while incorporating ARPA-E's approach to technology development into the execution of applied energy office Small Business Innovation Research/Small Business Technology."[45] The Administration requested $21 million for ARPA-E close-out activities and oversight of existing projects in FY2021. The Administration also had proposed to terminate ARPA-E in its FY2018, FY2019, and FY2020 budget requests, but Congress increased the program's funding in all three years, and the same pattern continued for FY2021.

The House voted to increase ARPA-E's funding to $435 million in FY2021, $10 million (2%) above the FY2020 enacted amount. In addition, Title VI of the House bill included $250 million for ARPA-E in emergency supplemental funding. The House Appropriations Committee report said, "The Committee again strongly rejects the short-sighted proposal to terminate ARPA-E. Instead, the Committee continues investment in this transformational program and directs the Department to continue to spend funds provided on research and development and program direction." The Senate Appropriations Committee majority draft bill included $430 million for ARPA-E. The Consolidated Appropriations Act, 2021, provided $427 million for ARPA-E and did not include the emergency supplemental funding passed by the House.

Weapons Activities Funding Increases

The FY2021 budget request for DOE Weapons Activities was 25% greater than the FY2020 enacted level ($15.602 billion vs. $12.457 billion). The FY2020 enacted appropriation for Weapons Activities was 12% above the FY2019 level. Weapons Activities programs are carried out by the National Nuclear Security Administration (NNSA), a semiautonomous agency within DOE.

Under Weapons Activities, the FY2021 budget request included funding for several major nuclear warhead life-extension programs (LEPs):

- NNSA requested $816 million for the B61-12 LEP in FY2021, an increase of $23 million over the $793 million enacted for FY2020. The B61-12 is to combine four existing types of B61 warheads. The first production unit (FPU) had been

[42] DOE, *FY2021 Congressional Budget Justification*, vol. 4, February 2020, p. 188, https://www.energy.gov/sites/prod/files/2020/03/f72/doe-fy2021-budget-volume-4_0.pdf.

[43] DOE, "Department of Energy Announces $32 Million for Lower-Cost Fusion Concepts," April 7, 2020, https://www.energy.gov/articles/department-energy-announces-32-million-lower-cost-fusion-concepts.

[44] DOE, "About ARPA-E," https://arpa-e.energy.gov/?q=arpa-e-site-page/about.

[45] DOE, *FY2021 Congressional Budget Request, Budget in Brief*, p. 75, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

scheduled for FY2020 but was delayed due to an issue with capacitors used in six major electrical components. According to NNSA, FPU is now scheduled for FY2022, and the program is to be completed in FY2026.

- NNSA requested $257 million for the W88 Alteration in FY2021, a reduction of $47 million from the $304 million enacted in FY2020. The program is to upgrade the arming-fuzing-firing system on the warhead and refresh the warhead's conventional high explosives. This warhead is carried on a portion of the D-5 (Trident) submarine-launched ballistic missiles (SLBMs). NNSA expected to provide the FPU of this warhead in 2020, but according to NNSA, the delivery was delayed due to an issue with capacitors used in three major components. According to its budget documents, NNSA now estimates that it will provide the FPU in FY2021.
- NNSA requested $1.0 billion for the W80-4 in FY2021, an increase of 11% over the $899 million enacted in FY2020. This is the warhead for the new long-range cruise missile. The LEP would seek to use common components from other LEPs and to improve warhead safety and security. The increase in the budget request for FY2021 reflected an increase in the scope of work on the program. The FPU is scheduled for FY2025.
- NNSA requested $541 million for the W87-1 warhead modification program for FY2021, a nearly fivefold increase over the $112 million enacted for FY2020. This increase reflected a "ramp-up" of activities across all program areas. The Air Force plans to deploy the W87-1 on the new U.S. land-based intercontinental ballistic missile (ICBM), the Ground-Based Strategic Deterrent (GBSD). NNSA has indicated that the FPU for the W87-1 is currently planned for FY2030. However, the FY2021 budget documents also note that the W87-0 warhead, which is currently deployed on U.S. ICBMs, will also be "qualified and deployed onto the GBSD." This would provide the Air Force with an alternative warhead if the W87-1 FPU is delayed.[46]

NNSA requested $2.458 billion for a new program area—Production Modernization. This new program area funds many of the nuclear materials projects that were a part of Directed Stockpile Work in the FY2020 budget. It has four subprograms: Primary Capability Modernization, Secondary Capability Modernization, Non-nuclear Capability Modernization, and Tritium and Domestic Uranium Enrichment. The budget request sought increases in funding for each of the subprograms, although nearly 70% of the added funding was for Primary Capability Modernization.

According to NNSA's budget documents, the Primary Capability Modernization program "consolidates management of nuclear material processing capabilities … needed for the production of primaries."[47] Primaries are the plutonium pits and high explosives that serve as the core of nuclear weapons. In FY2020, Congress approved $797.8 million for the plutonium modernization programs that are now a part of this program area; NNSA is requesting $1.369 million for FY2021. Congress approved $13.8 million for high explosives and energetics in FY2020; NNSA requested $67.4 million in FY2021.

The Plutonium Sustainment subprogram plans to expand production of plutonium pits from existing facilities at Los Alamos National Laboratory in New Mexico to a new facility

[46] DOE, *FY2021 Congressional Budget Justification*, vol. 1, February 2020, p. 118, https://www.energy.gov/sites/prod/files/2020/03/f72/doe-fy2021-budget-volume-1_2.pdf.

[47] Ibid., p. 92.

(repurposed from the canceled Mixed Oxide Fuel Fabrication Facility) at the Savannah River Site in South Carolina. The Plutonium Sustainment subprogram, which received $712 million for FY2020, is to be divided into four subprograms for FY2021: Los Alamos Plutonium Modernization ($593.5 million), Plutonium Pit Production Project at Los Alamos ($226 million), Savannah River Plutonium Modernization ($200 million), and Savannah River Plutonium Processing ($241.9 million). The two program areas at Los Alamos fund activities needed to recapitalize buildings and capacity to meet pit production requirements at Los Alamos. The programs at Savannah River support efforts to plan for operations at the new pit facility, to work on its design and site and facility preparation, and to begin long-lead procurement.

The House approved $13.660 billion for Weapons Activities for FY2021. While this would be an increase of $1.203 billion (10%) over the amount appropriated in FY2020, it is $1.942 billion lower than the FY2021 budget request of $15.602 billion. The House did not approve some of NNSA's proposed changes in the structure of the Weapons Activities programs, noting in the Appropriations Committee Report (H.Rept. 116-449) that, although NNSA had sought "to engage in a constructive and transparent manner in communicating the proposed changes," these efforts were not sufficient and "the Committee believes additional oversight and monitoring is necessary."

The House-passed bill also contained a provision that would bar the use of funds "to conduct, or make specific preparations for, any explosive nuclear weapons test that produces any yield" (Sec. 8133). Trump Administration officials had indicated that they did not currently plan to conduct such a test, and would only consider doing so if there were concerns about the safety or reliability of U.S. nuclear weapons. Recent reports indicated that the Administration had considered using such a test to exhibit U.S. nuclear weapons capabilities.[48]

The Senate Appropriations Committee majority draft bill included $15.602 billion for weapons activities, the same as the request and $1.942 billion above the House-passed level. The Senate committee draft explanatory statement "supports the initial studies to evaluate the W93 warhead" (the House had eliminated the funding) and supported the funding for the pit production plan, using both Los Alamos and the Savannah River site.[49]

The Consolidated Appropriations Act, 2021, provided $15.345 billion for weapons activities, $257 million (2%) below the request and $2.888 billion (23%) above the FY2020 enacted amount. The explanatory statement reiterated congressional concerns about NNSA's pit production plans. It mandated that NNSA provide a plan outlining an integrated master schedule for "all pit production-related project and program activities" going forward. It also directed NNSA to develop "a comprehensive, integrated ten-year research program for pit and plutonium aging that represents a consensus program among the national laboratories and federal sponsors." For more information, see CRS Report R44442, *Energy and Water Development Appropriations: Nuclear Weapons Activities*, by Amy F. Woolf.

Cleanup of Former Nuclear Sites: Proposed Reductions and Transfers

DOE's Office of Environmental Management (EM) is responsible for environmental cleanup and waste management at the department's nuclear facilities. The $6.066 billion request for EM

[48] Hudson, John and Paul Sonne, "Trump Administration Discussed Conducting First U.S. Nuclear Test in Decades," *Washington Post*, May 22, 2020, https://www.washingtonpost.com/national-security/trump-administration-discussed-conducting-first-us-nuclear-test-in-decades/2020/05/22/a805c904-9c5b-11ea-b60c-3be060a4f8e1_story.html.

[49] Senate Appropriations Committee majority draft explanatory statement, p. 127.

activities for FY2021 would have been a decrease of $1.390 billion (19%) from the FY2020 enacted level of $7.455 billion. The budgetary components of the EM program are Defense Environmental Cleanup (-20%) and Non-Defense Environmental Cleanup (-14%). The largest proposed decreases were at the Hanford Site (WA), where projects managed by the Richland Operations Office would have been reduced by $347 million (-35%) and those by the Office of River Protection by $358 million (-22%). Other relatively large EM reductions were proposed for the Oak Ridge Site (TN), down by $251 million (-37%); Idaho National Laboratory, down by $175 million (-39%); and Los Alamos National Laboratory, down by $100 million (-46%). The DOE budget justification attributed many of the proposed funding decreases to completion of various cleanup projects at the sites involved.[50]

The FY2021 request included a proposal to transfer management of the Formerly Utilized Sites Remedial Action Program from USACE to the Office of Legacy Management (LM), the DOE office responsible for long-term stewardship of remediated sites. The transfer had also been proposed for FY2020 but was not approved by Congress, nor was it approved for FY2021. The FY2021 LM budget request included $150 million for FUSRAP, down from $200 million appropriated to USACE for the program in FY2020. According to the DOE budget justification, "LM will be responsible for the administration of FUSRAP, USACE will continue to conduct cleanup of FUSRAP sites, and LM will continue to conduct LTS&M [long-term surveillance and maintenance] after cleanup activities are completed." Under the proposal, LM would have reimbursed USACE for the cost of the cleanup activities.[51]

The House approved $7.458 billion for EM activities, an increase of $2 million from the FY2020 enacted level. In addition, the House bill includes $3.125 billion in EM emergency supplemental funding, including $2.685 billion for defense cleanup, $200 million for non-defense cleanup, and $240 million for the Uranium Enrichment Decontamination and Decommissioning Fund. The House did not approve the proposed transfer of FUSRAP to DOE or the proposed funding reduction, recommending an FY2021 appropriation of $210 million, up $10 million (5%) from the FY2020 enacted amount. In addition, Title VI of Division C included $500 million in emergency supplemental appropriations for FUSRAP, but they were not enacted.

The Senate Appropriations Committee majority draft bill includes $7.534 billion for EM, $1.468 billion above the request and $76 million above the House-passed level, excluding emergency supplementals. The Consolidated Appropriations Act, 2021, provided $7.586 billion for EM, an increase of $131 million (2%) over the FY2020 enacted amount.

Southwest Border Regional Commission and Southeast Crescent Regional Commission Funding

The Consolidated Appropriations Act, 2021, provided $250,000 for the Southwest Border Regional Commission (SBRC)—the first appropriations for the SBRC since it was authorized in the 2008 farm bill (P.L. 110-234) along with the Southeast Crescent Regional Commission (SCRC) and the Northern Border Regional Commission (NBRC). The SBRC is one of seven authorized federal regional commissions and authorities, of which four are currently active: the Appalachian Regional Commission, the NBRC, the Denali Commission, and the Delta Regional

[50] DOE, *FY2021 Congressional Budget Request, Budget in Brief*, p. 53, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

[51] DOE, *FY2021 Budget in Brief*, February 2020, p. 56, https://www.energy.gov/sites/prod/files/2020/02/f72/doe-fy2021-budget-in-brief_0.pdf.

Authority.[52] If formed, the SBRC would be the fifth active federal regional commission. However, even with the enacted appropriation, the SBRC's formation additionally depends on the appointment of a federal co-chair by the President with the advice and consent of the Senate, as required by statute. According to the explanatory statement, "The Administration is encouraged to promptly appoint a Federal Co-Chair in order to establish key partnerships with local communities, improve economic conditions and travel along the southwest border, and to consider opportunities to establish a regional presence in or near major inland ports of entry."

The enacted FY2021 funding measure also included $1 million for the SCRC, which is inactive as well. Since FY2010, the SCRC has received annual appropriations of $250,000, but has yet to form, as no federal co-chair has ever been appointed. Although the SCRC's increased appropriation provided it with the ability to conduct some limited grantmaking upon formation, its development would still require a presidentially appointed and Senate-confirmed federal co-chair. The House-passed bill included the same funding levels for SBRC and SCRC as enacted for FY2021, while the Senate Appropriations Committee majority draft bill would have provided zero.

Bill Status and Recent Funding History

Table 2 indicates the steps taken during consideration of FY2021 Energy and Water Development appropriations. (For more details, see the CRS Appropriations Status Table at http://www.crs.gov/AppropriationsStatusTable/Index.)

Table 2. Status of Energy and Water Development Appropriations, FY2021

Subcommittee Markup							Final Approval		
House	Senate	House Comm.	House Passed	Senate Comm.	Senate Passed	Conf. Report	House	Senate	Public Law
7/7/20		7/13/20	7/31/20				12/21/20	12/21/20	12/27/20

Source: CRS Appropriations Status Table.

Note: The Senate Appropriations Committee majority released a draft FY2021 Energy and Water Development appropriations bill and explanatory statement November 10, 2020, at https://www.appropriations.senate.gov/news/committee-releases-fy21-bills-in-effort-to-advance-process-produce-bipartisan-results.

Table 3 includes budget totals for energy and water development appropriations enacted for FY2015 through FY2020 and major stages of consideration for FY2021.

[52] For more information, see CRS Report R45997, *Federal Regional Commissions and Authorities: Structural Features and Function*, by Michael H. Cecire.

Table 3. Energy and Water Development Appropriations, FY2015-FY2021

(budget authority in billions of current dollars)

FY2015	FY2016	FY2017	FY2018	FY2019	FY2020	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Majority Draft	FY2021 Enacted
34.8	37.3	37.4[a]	43.2[b]	44.7[c]	48.3[d]	42.6	49.6[e]	51.9	49.5

Source: Compiled by CRS from totals provided by congressional budget documents.

Notes: Figures exclude permanent budget authorities and reflect rescissions.

a. Amount does not include $1.0 billion in emergency funding for the USACE (P.L. 114-254).

b. Amount does not include $17.4 billion in emergency funding for USACE and DOE (P.L. 115-123).

c. Amount does not include supplemental funding provided by P.L. 116-20 ($3.258 billion for USACE and $15.85 million for Reclamation).

d. Amount does not include supplemental funding provided by P.L. 116-136.

e. Amount does not include emergency funding.

Description of Major Energy and Water Programs

The annual Energy and Water Development appropriations bill includes four titles: Title I—Corps of Engineers—Civil; Title II—Department of the Interior (Bureau of Reclamation and Central Utah Project); Title III—Department of Energy; and Title IV—Independent Agencies, as shown in **Table 4**. Major programs in the bill are described in this section in the approximate order they appear in the bill. Previous appropriations and the amounts recommended and approved during the major stages of the FY2021 appropriations process are shown in the accompanying tables, and additional details about many of these programs are provided in separate CRS reports as indicated. For a discussion of current funding issues related to these programs, see "Funding Issues and Initiatives," above. Congressional clients may obtain more detailed information by contacting CRS analysts listed in CRS Report R42638, *Appropriations: CRS Experts*, by James M. Specht and Justin Murray.

Table 4. Energy and Water Development Appropriations Summary

(budget authority in millions of current dollars)

Title	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Majority Draft	FY2021 Approp.
Title I: Corps of Engineers	6,827	6,999	7,650	5,966	7,629	7,722	7,796
Title II: CUP and Reclamation	1,480	1,565	1,680	1,138	1,655	1,690	1,691
Title III: Department of Energy	34,569	35,709	38,657	35,729	40,864	42,041	39,627
Title IV: Independent Agencies	392	390	407	333	389	413	414
General provisions	—	21	—	—	—	—	—
Subtotal	43,268	44,684	48,395	43,169	50,536	51,866	49,528
Rescissions and Scorekeeping Adjustments[a]	-49	-24	-71	-610	-935	-2	-3
E&W Total	**43,219**	**44,660**	**48,324**	**42,559**	**49,601**	51,864	49,525
FY2021 Emergency Supplemental					**44,050**		
Total with Supplemental					**93,651**		

Sources: Explanatory statement for H.R. 133, 116th Congress; FY2021 Senate Appropriations Committee majority draft; H.R. 7617; H.Rept. 116-449; President's Budget FY2021; Explanatory Statement for Division C of H.R. 1865, 116th Congress; S.Rept. 116-102; S. 2470; H.R. 2740; CBO Current Status Report; H.Rept. 116-83; H.Rept. 115-929; S.Rept. 115-258; and P.L. 115-31 and explanatory statement. Subtotals may include other adjustments. Columns may not sum to totals because of rounding and adjustments.

a. Budget "scorekeeping" refers to official determinations of spending amounts for congressional budget enforcement purposes. These scorekeeping adjustments may include rescissions and offsetting revenues from various sources.

Agency Budget Justifications

FY2021 budget justifications for the largest agencies funded by the annual Energy and Water Development appropriations bill can be found through the links below. The justifications provide detailed descriptions and funding breakouts for programs, projects, and activities under the agencies' jurisdiction.

- Title I, U.S. Army Corps of Engineers, Civil Works, http://www.usace.army.mil/Missions/CivilWorks/Budget
- Title II
  - Bureau of Reclamation, https://www.usbr.gov/budget/
  - Central Utah Project, https://www.doi.gov/sites/doi.gov/files/uploads/fy2020_cupca_budget_justification.pdf

- Title III, Department of Energy, https://www.energy.gov/cfo/downloads/fy-2021-budget-justification
- Title IV, Independent Agencies
  - Appalachian Regional Commission, https://www.arc.gov/publications/BudgetDocuments.asp
  - Nuclear Regulatory Commission, https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1100/
  - Defense Nuclear Facilities Safety Board, https://www.dnfsb.gov/about/congressional-budget-requests
  - Nuclear Waste Technical Review Board, http://www.nwtrb.gov/about-us/plans

Army Corps of Engineers

USACE is an agency in the Department of Defense with both military and civilian responsibilities. Under its civil works program, which is funded by the Energy and Water Development appropriations bill, USACE plans, builds, operates, and in some cases maintains water resource facilities for coastal and inland navigation, riverine and coastal flood risk reduction, and aquatic ecosystem restoration.[53]

In recent decades, Congress has generally authorized USACE studies, construction projects, and other activities in omnibus water authorization bills, typically titled as Water Resources Development Acts (WRDA), prior to funding them through appropriations legislation. Recent Congresses enacted the following omnibus water resources authorization acts: in June 2014, the Water Resources Reform and Development Act of 2014 (WRRDA, P.L. 113-121); in December 2016, the Water Resources Development Act of 2016 (Title I of P.L. 114-322, the Water Infrastructure Improvements for the Nation Act [WIIN Act]); and in October 2018, the Water Resources Development Act of 2018 (Title I of P.L. 115-270, America's Water Infrastructure Act of 2018 [AWIA 2018]). These acts consisted largely of authorizations for new USACE projects, and they altered numerous USACE policies and procedures.[54]

Unlike for highways and in municipal water infrastructure programs, federal funds for USACE are not distributed to states or projects based on formulas or delivered via competitive grants. Instead, USACE generally is directly involved in planning, designing, and managing the construction of projects that are cost-shared with nonfederal project sponsors.

From the 112th to the 116th Congresses, earmark moratorium policies limited congressionally directed funding of site-specific projects (i.e., *earmarks*). Prior to the 112th Congress, Congress would direct funds to specific projects not in the budget request or increase funds for certain projects. For FY2011-FY2021, Congress appropriated additional funding for categories of USACE work without identifying specific projects. For example, in FY2020, Congress provided $2.53 billion in additional funding for 26 categories of USACE activities (e.g., construction related to flood and storm damage reduction). After congressional enactment of the appropriations legislation and accompanying report language on priorities and other guidance for

[53] Military responsibilities are funded through the Military Construction, Veterans Affairs, and Related Agencies appropriations bill.

[54] For more information on USACE authorization legislation, see CRS In Focus IF11322, *Water Resources Development Acts: Primer*, by Nicole T. Carter and Anna E. Normand, and CRS Report R45185, *Army Corps of Engineers: Water Resource Authorization and Project Delivery Processes*, by Nicole T. Carter and Anna E. Normand.

use of the additional funding, the Administration develops a work plan that reports on (1) the studies and construction projects selected to receive funding for the first time (new starts) and (2) the specific projects receiving additional funds. For more information, see CRS In Focus IF11462, *Army Corps of Engineers: FY2021 Appropriations*, by Anna E. Normand and Nicole T. Carter, and CRS Report R46320, *U.S. Army Corps of Engineers: Annual Appropriations Process and Issues for Congress*, by Anna E. Normand and Nicole T. Carter. **Table 5** shows USACE appropriations accounts from FY2018.

Table 5. Army Corps of Engineers

(budget authority in millions of current dollars)

Program	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Majority Draft	FY2021 Approp.
Investigations and Planning	123.0	125.0	151.0	102.6	151.0	151.2	153.0
Construction	2,085.0	2,183.0	2,681.0	2,173.2[a]	2,619.9	2,661.0	2,692.7
Mississippi River and Tributaries (MR&T)	425.0	368.0	375.0	209.9[a]	365.0	395.0	380.0
Operation and Maintenance (O&M)	3,630.0	3,739.5	3,790.0	1,996.5[a]	3,838.0	3,781.0	3,849.7
Regulatory	200.0	200.0	210.0	200.0	210.0	210.0	210.0
General Expenses	185.0	193.0	203.0	187.0	195.0	211.0	206.0
FUSRAP[b]	139.0	150.0	200.0	0	210.0	250.0	250.0
Flood Control and Coastal Emergencies (FCCE)	35.0	35.0	35.0	77.0	35.0	35.0	35.0
Office of the Asst. Secretary of the Army	5.0	5.0	5.0	5.0	5.0	3.0	5.0
Water Infrastructure Finance and Innovation (WIFIA) Program						25.0	14.2[c]
Harbor Maintenance Trust Fund				1,015.0			

Program	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Majority Draft	FY2021 Approp.
Inland Waterways Trust Fund				0			
Rescissions							-0.5
Total Title I	**6,827.0**	**6,998.5**	**7,650.0**	**5,966.2**	**7,628.9**	**7,722.2**	7,795.0
FY2021 Emergency Supplemental					**17,000.0**		
Total with Supplemental					**24,628.9**		

Sources: Explanatory statement for H.R. 133, 116th Congress; FY2021 Senate Appropriations Committee majority draft; H.R. 7617, H.Rept. 116-449; President's Budget, FY2021; Explanatory Statement for Division C of H.R. 1865, 116th Congress; S.Rept. 116-102; S. 2470; H.R. 2740; CBO Current Status Report; H.Rept. 116-83; FY2020 Budget Justification; H.Rept. 115-929; S.Rept. 115-258; S.Rept. 115-132; H.Rept. 115-230; and P.L. 115-31 and explanatory statement. FY2020 and FY2021 request numbers can be found at https://www.usace.army.mil/Missions/Civil-Works/Budget/. Columns may not sum to totals because of rounding.

a. In the Administration's request, some activities that would have previously been funded in these accounts were proposed to be funded directly from the Harbor Maintenance Trust Fund (HMTF) and Inland Waterway Trust Fund (IWTF) accounts. That is, the Administration proposed funding eligible USACE activities directly from the trust funds. This would replace the current practice of having USACE's O&M, Construction, and MR&T accounts incur expenses for HMTF-eligible and IWTF-eligible activities, and for these expenses to be reimbursed from the HMTF and IWTF accounts. For example, HMTF-eligible maintenance dredging would no longer be funded by the O&M account and reimbursed by the HMTF; instead the dredging would be funded directly from the HMTF account. Similar proposals were not enacted in FY2019 and FY2020.

b. Formerly Utilized Sites Remedial Action Program. The Administration's FY2020 and FY2021 requests proposed transferring administration and funding of FUSRAP to the DOE Office of Legacy Management, but the proposal was not enacted in either year.

c. The Consolidated Appropriations Act, 2021, created a new USACE account to support direct loans and for the cost of guaranteed loans, as authorized by the Water Infrastructure Finance and Innovation Act of 2014 (Title V, Subtitle C of P.L. 113-121).

Bureau of Reclamation and Central Utah Project

Most of the large dams and water diversion structures in the West were built by, or with the assistance of, the Bureau of Reclamation. While the Corps of Engineers built hundreds of flood control and navigation projects, Reclamation's original mission was to develop water supplies, primarily for irrigation to reclaim arid lands in the West for farming and ranching. Reclamation has evolved into an agency that assists in meeting the water demands in the West while working to protect the environment and the public's investment in Reclamation infrastructure. The agency's municipal and industrial water deliveries have more than doubled since 1970.

Today, Reclamation manages hundreds of dams and diversion projects, including more than 300 storage reservoirs, in 17 western states. These projects provide water to approximately 10 million acres of farmland and 31 million people. Reclamation is the largest wholesale supplier of water in the 17 western states and the second-largest hydroelectric power producer in the nation. Reclamation facilities also provide substantial flood control, recreation, and other benefits.

Reclamation facility operations are often controversial, particularly for their effect on fish and wildlife species and because of conflicts among competing water users during drought conditions.

As with the Corps of Engineers, the Reclamation budget is made up largely of individual project funding lines, rather than general programs that would not be covered by congressional earmark requirements. Therefore, as with USACE, these Reclamation projects have often been subject to earmark disclosure rules. The moratorium on earmarks through FY2021 restricted congressional steering of money directly toward specific Reclamation projects.

Reclamation's single largest account, Water and Related Resources, encompasses the agency's traditional programs and projects, including construction, operations and maintenance, dam safety, and ecosystem restoration, among others.[55] Reclamation also typically requests funds in a number of smaller accounts, and has proposed additional accounts in recent years.

Implementation and oversight of the Central Utah Project, also funded by Title II, is conducted by a separate office within the Department of the Interior.[56]

For more information, see CRS In Focus IF11465, *Bureau of Reclamation: FY2021 Appropriations*, by Charles V. Stern. Previous appropriations and the amounts recommended and approved during the major stages of the FY2021 appropriations process are shown in **Table 6**.

Table 6. Bureau of Reclamation and CUP

(budget authority in millions of current dollars)

Program	FY2018 Approp	FY2019 Approp	FY2020 Approp	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp
Water and Related Resources	1,332.1	1,392.0	1,512.2	979.0	1,487.0	1,521.1	1,521.1
Policy and Administration	59.0	61.0	60.0	60.0	54.0	60.0	60.0
CVP Restoration Fund (CVPRF)	41.4	62.0	54.8	55.9	55.9	55.9	55.9
Calif. Bay-Delta (CALFED)	37.0	35.0	33.0	33.0	33.0	33.0	33.0
Gross Current Reclamation Authority	**1,469.5**	**1,550.0**	**1,660.0**	**1,127.9**	**1,629.9**	1,670.0	1,670.0
Central Utah Project (CUP) Completion	10.5	15.0	20.0	10.0	25.0	20.0	21.0

[55] The Water and Related Resources Account is largely funded by the Reclamation Fund, which receives and distributes receipts related to a number of federal activities (including royalties received from oil and gas leasing on federal lands). For more on this fund and financing of selected Reclamation Projects, see CRS Report R41844, *The Reclamation Fund: A Primer*, by Charles V. Stern.

[56] The Central Utah Project moves water from the Colorado River basin in eastern Utah to the western slopes of the Wasatch Mountain range. It was authorized in 1956 under the Colorado River Storage Project Act (P.L. 84-485). For more information, see the CUP website at https://www.cupcao.gov/.

Program	FY2018 Approp	FY2019 Approp	FY2020 Approp	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp
Total, Title II Current Authority (CUP and Reclamation)	**1,480.0**	**1,565.0**	**1,680.0**	**1,137.9**	**1,654.9**	1,690.0	1,691.0
FY2021 Emergency Supplemental					**3,000.0**		
Total with Supplemental					**4,654.9**		

Sources: Explanatory statement for H.R. 133, 116th Congress; FY2021 Senate Appropriations Committee majority draft; H.R. 7617, H.Rept. 116-449; President's Budget, FY2021; Explanatory Statement for Division C of H.R. 1865, 116th Congress; S.Rept. 116-102; H.R. 2740; CBO Current Status Report; H.Rept. 116-83; FY2020 Budget Justifications; H.Rept. 115-929; S.Rept. 115-258; S.Rept. 115-132; H.Rept. 115-230; and P.L. 115-31 and explanatory statement. Excludes offsets and permanent appropriations.

Notes: Columns may not sum to totals because of rounding. CVP = Central Valley Project.

Department of Energy

The Energy and Water Development appropriations bill has funded all DOE programs since FY2005. Major DOE activities include (1) R&D on renewable energy, energy efficiency, nuclear power, fossil energy, and electricity; (2) the Strategic Petroleum Reserve; (3) energy statistics, projections, and analysis; (4) general science; (5) loan programs; (6) environmental cleanup; and (7) nuclear weapons and nonproliferation programs. **Table 7** provides the recent funding history for DOE programs, which are briefly described further below.

Table 7. Department of Energy

(budget authority in millions of current dollars)

	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp.
ENERGY PROGRAMS							
Energy Efficiency and Renewable Energy	2,321.8	2,379.0	2,799.0	719.6	2,850.2	2,848.0	2,861.8
Electricity Delivery and Energy Reliability[a]	248.3						—
Electricity Delivery		156.0	190.0	195.0	195.0	223.0	211.7
Cybersecurity, Energy Security, and Emerg. Resp.		120.0	156.0	184.6	165.0	156.0	156.0
Nuclear Energy	1,205.1	1,326.1	1,493.4[b]	1,179.9[c]	1,435.8	1,505.3	1,507.6
Fossil Energy R&D	726.8	740.0	750.0	730.6	735.0	750.0	750.0
Uranium Reserve				150.0	0	120.0	0[d]
Naval Petroleum and Oil Shale Reserves	4.9	10.0	14.0	13.0	13.0	13.0	13.0

	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp.
Strategic Petroleum Reserve	260.4	245.0	205.0	119.1	202.5	188.1	189.0
Northeast Home Heating Oil Reserve	6.5	10.0	10.0	-84.0	10.0	10.0	6.5
Energy Information Administration	125.0	125.0	126.8	128.7	126.8	126.8	126.8
Non-Defense Environmental Cleanup	298.4	310.0	319.2	275.8	315.0	326.0	319.2
Uranium Enrichment Decontamination and Decommissioning Fund	840.0	841.1	881.0	806.2	821.6	848.0	841.0
Science	6,259.9	6,585.0	7,000.0	5,837.8	7,055.0	7,026.0	7,026.0
AI Technology Office				4.9	0	0	0
Advanced Research Projects Agency—Energy (ARPA-E)	353.3	366.0	425.0	-310.7	435.0	430.0	427.0
Nuclear Waste Disposal	0	0	0	27.5	27.5	0	27.5
Departmental Admin. (net)	189.7	165.9	161.0	136.1	137.9	161.0	166.0
Office of Inspector General	49.0	51.3	54.2	57.7	57.7	57.7	57.7
International Affairs		0	0	33.0	0	0	0
Office of Indian Energy	0	18.0	22.0	8.0	22.3	22.0	22.0
Advanced Technology Vehicles Manufacturing (ATVM) Loans	5.0	5.0	5.0	0	5.0	5.0	5.0
ATVM Rescission of Emergency Funding							-1,908.0
Title 17 Loan Guarantee	23.0	18.0	29.0	-384.7	29.0	29.0	29.0
Title 17 Rescission of Emergency Funding							-392.0
Tribal Indian Energy Loan Guarantee	1.0	1.0	2.0	-8.5	2.0	2.0	2.0
TOTAL, ENERGY PROGRAMS	**12,918.0**	**13,472.4**	**14,633.6**	**9,819.7**	**14,641.3**	**14,846.9**	**12,444.8**
DEFENSE ACTIVITIES							
National Nuclear Security Administration (NNSA)							
Weapons Activities	10,642.1	11,100.0	12,457.1	15,602.0	13,659.6	15,602.0	15,345.0
Nuclear Nonproliferation	1,999.2	1,930.0	2,164.4	2,031.0	2,240.0	2,095.0	2,260.0
Naval Reactors	1,620.0	1,788.6	1,648.4	1,684.0	1,684.0	1,684.0	1,684.0

	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp.
Office of Admin./Salaries and Expenses	407.6	410.0	434.7	454.0	454.0	443.2	443.2
Total, NNSA	**14,669.0**	**15,228.6**	**16,704.6**	**19,771.0**	**18,037.6**	**19,824.2**	**19,732.2**
Defense Environmental Cleanup	5,988.0	6,024.0	6,255.0	4,983.6	6,321.0	6,360.0	6,426.0
Defense Uranium Enrichment D&D					821.6		
Other Defense Activities	840.0	860.3	906.0	1,054.7[b]	942.3	906.0	920.0
Defense Nuclear Waste Disposal	0	0	0	0	0	0	0
TOTAL, DEFENSE ACTIVITIES	**21,497.0**	**22,112.9**	**23,865.6**	**25,809.3**	**26,122.5**	**27,090.2**	**27,078.2**
POWER MARKETING ADMINISTRATIONS (PMAs)							
Southwestern	11.4	10.4	10.4	10.4	10.4	10.4	10.4
Western	93.4	89.4	89.2	89.4	89.4	89.4	89.4
Falcon and Amistad O&M	0.2	0.2	0.2	0.2	0.2	0.2	0.2
TOTAL, PMAs	**105.0**	**100.0**	**99.8**	**100.0**	**100.0**	100.0	100.0
General provisions			-12.7	-607.0		2.0	2.0
DOE total appropriations	**34,569.1**	**35,708.9**	**38,657.2**	**35,732.2**	**40,863.8**	**42,041.4**	**39,627.3**[e]
Offsets and adjustments	-49.0	-23.6	-70.9	-610.2	—	-2.2	-2.2
Total, DOE	**34,520.1**	**35,685.3**	**38,586.3**	**35,122.1**	**40,863.8**	**42,039.1**	**39,625.0**
FY2021 Emergency Supplemental					**24,050.0**		
Total with Supplemental					**64,913.8**		

Sources: Explanatory statement for H.R. 133, 116th Congress; FY2021 Senate Appropriations Committee majority draft; H.R. 7617; H.Rept. 116-449; President's Budget, FY2021; Explanatory Statement for Division C of H.R. 1865, 116th Congress; S.Rept. 116-102; H.R. 2740; CBO Current Status Report; H.Rept. 116-83; H.Rept. 115-929; S.Rept. 115-258; S.Rept. 115-132; H.Rept. 115-230; and P.L. 115-31 and explanatory statement.

Notes: Columns may not sum to totals because of rounding. AI = Artificial Intelligence.

a. The Office of Electric Delivery and Energy Reliability was split in FY2019 into the Office of Electricity Delivery and the Office of Cybersecurity, Energy Security, and Emergency Response.

b. Includes defense budget function funding of $153.4 million in FY2020 and $137.8 million.

c. Includes $141 million for the Formerly Utilized Sites Remedial Action Program that is currently managed by USACE.

d. Uranium Reserve funding of $75 million provided under Weapons Activities account.

e. Total excludes $2.2 million rescission from EERE that is included under "offsets and adjustments."

Energy Efficiency and Renewable Energy

DOE's Office of Energy Efficiency and Renewable Energy (EERE) conducts research and development on transportation energy technology, energy efficiency in buildings and manufacturing processes, and the production of solar, wind, geothermal, and other renewable energy. EERE also administers formula grants to states.

The Sustainable Transportation program area includes electric vehicles, vehicle efficiency, and alternative fuels. DOE's electric vehicle program aims to "reduce the cost of electric vehicle batteries by more than half, to less than $100/kWh [kilowatt-hour] (ultimate goal is $80/kWh), increase range to 300 miles, and decrease charge time to 15 minutes or less." DOE's vehicle fuel cell program is focusing on the costs of fuel cells and hydrogen to fuel them. According to the FY2021 budget request, "Investments in fuel cell technologies will increase the emphasis on heavy-duty vehicles and new applications (e.g., trucks, marine, rail, aviation, data centers)." Regarding biofuels R&D, the DOE request said, "By 2030, the U.S. has the potential to produce 1 billion dry tons of non-food biomass resources without disrupting agricultural markets for food and animal feed."[57]

Renewable power programs focus on electricity generation from solar, wind, water, and geothermal sources. The solar energy program has a goal of achieving, by 2030, costs of 3 cents per kWh for unsubsidized, utility-scale photovoltaics (PV) and 5 cents/kWh for baseload concentrating solar power (CSP) systems. This would require cost reductions of 40%-65% below DOE's 2018 benchmarks. Wind R&D is to focus on early-stage research and testing to reduce costs and improve performance and reliability. For the geothermal program, DOE requested funding in FY2021 to "support two new subsurface enhancement and sustainability efforts": one on well technology to isolate geothermal target zones, and the other on assessing reservoir properties for enhanced geothermal systems.[58]

In the energy efficiency program area, the advanced manufacturing program focuses on improving the energy efficiency of manufacturing processes and on the manufacturing of energy-related products. The building technologies program includes R&D on lighting, space conditioning, windows, and control technologies to reduce building energy-use intensity. The energy efficiency program provides two types of formula grants to states: weatherization grants for improving the energy efficiency of low-income housing units and state energy planning grants.[59]

For more details, see CRS Report R44980, *DOE's Office of Energy Efficiency and Renewable Energy (EERE): Appropriations Status*, by Corrie E. Clark.

Electricity Delivery, Cybersecurity, Energy Security, and Energy Reliability

The Office of Cybersecurity, Energy Security, and Emergency Response (CESER) was created from programs that were previously part of the Office of Electricity Delivery and Energy Reliability. The programs that were not moved into CESER became part of the DOE Office of Electricity (OE).[60]

[57] DOE, *FY2021 Congressional Budget Justification*, vol. 3, part 1, p. 12, https://www.energy.gov/sites/prod/files/2020/04/f73/doe-fy2021-budget-volume-3-part-1.pdf.

[58] Ibid., p. 13.

[59] Ibid., p. 14.

[60] DOE, "Secretary of Energy Rick Perry Forms New Office of Cybersecurity, Energy Security, and Emergency

OE's mission is to lead DOE efforts "to strengthen, transform, and improve energy infrastructure so that consumers have access to secure and resilient sources of energy." Major priorities of OE are developing a model of North American energy vulnerabilities, pursuing megawatt-scale electricity storage, integrating electric power system sensing technology, and analyzing electricity-related policy issues.[61] The office also includes the DOE power marketing administrations, which are funded from separate appropriations accounts.

CESER is the federal government's lead entity for energy sector-specific responses to energy security emergencies—whether caused by physical infrastructure problems or by cybersecurity issues. The office conducts R&D on energy infrastructure security technology; provides energy sector security guidelines, training, and technical assistance; and enhances energy sector emergency preparedness and response.[62]

DOE's Multiyear Plan for Energy Sector Cybersecurity describes the department's strategy to "strengthen today's energy delivery systems by working with our partners to address growing threats and promote continuous improvement, and develop game-changing solutions that will create inherently secure, resilient, and self-defending energy systems for tomorrow."[63] The plan includes three goals that DOE has established for energy sector cybersecurity:

- strengthen energy sector cybersecurity preparedness;
- coordinate cyber incident response and recovery; and
- accelerate research, development, and demonstration (RD&D) of resilient energy delivery systems.

Nuclear Energy

DOE's Office of Nuclear Energy (NE) "focuses on three major mission areas: the nation's existing nuclear fleet, the development of advanced nuclear reactor concepts, and fuel cycle technologies," according to DOE's FY2021 budget justification. It called nuclear energy "a key element of United States energy independence, energy dominance, electricity grid resiliency, national security, and clean baseload power."[64]

The Reactor Concepts program area comprises research on advanced reactors, including advanced small modular reactors, and research to enhance the "sustainability" of existing commercial light water reactors. Advanced reactor research focuses on "Generation IV" reactors, as opposed to the existing fleet of commercial light water reactors, which are generally classified as generations II and III. R&D under this program focuses on advanced coolants, fuels, materials, and other technology areas that could apply to a variety of advanced reactors. To help develop those technologies, the Reactor Concepts program is developing a Versatile Test Reactor that would allow fuels and materials to be tested in a fast neutron environment (in which neutrons would not be slowed by water, graphite, or other "moderators"). Research on extending the life of existing commercial light water reactors (moderated and cooled by ordinary water) beyond 60

Response," press release, February 14, 2018, https://www.energy.gov/articles/secretary-energy-rick-perry-forms-new-office-cybersecurity-energy-security-and-emergency.

[61] DOE, *FY2021 Congressional Budget Justification*, vol. 3, part 1, February 2020, p. 262, https://www.energy.gov/sites/prod/files/2020/04/f73/doe-fy2021-budget-volume-3-part-1.pdf.

[62] Ibid., p. 317.

[63] DOE, *Multiyear Plan for Energy Sector Cybersecurity*, March 2018, p. 5, https://www.energy.gov/sites/prod/files/2018/05/f51/DOE%20Multiyear%20Plan%20for%20Energy%20Sector%20Cybersecurity%20_0.pdf.

[64] DOE, *FY2021 Congressional Budget Justification*, vol. 3, part 2, February 2020, p. 9, https://www.energy.gov/sites/prod/files/2020/04/f73/doe-fy2021-budget-volume-3-part-2.pdf.

years, the maximum operating period currently licensed by NRC, is being conducted by this program with industry cost-sharing.

The Fuel Cycle Research and Development program includes generic research on nuclear waste management and disposal. One of the program's primary activities is the development of technologies to separate the radioactive constituents of spent fuel for reuse or solidifying into stable waste forms. Other major research areas in the Fuel Cycle R&D program include the development of accident-tolerant fuels for existing commercial reactors, evaluation of fuel cycle options, and development of improved technologies to prevent diversion of nuclear materials for weapons. The program is also developing sources of high-assay low enriched uranium (HALEU), in which uranium is enriched to between 5% and 20% in the fissile isotope U-235, for potential use in advanced reactors.

DOE's Advanced Reactor Demonstration Program was initiated by the explanatory statement for the enacted FY2020 appropriations measure, with continued funding provided by the Consolidated Appropriations Act, 2021. The program is to provide up to 50% cost sharing for two nuclear reactor demonstration projects, up to 20% cost sharing for development work for two to five additional demonstrations, and funding for related advanced reactor commercialization activities. For more information, see CRS Report R45706, *Advanced Nuclear Reactors: Technology Overview and Current Issues*, by Danielle A. Arostegui and Mark Holt.

Fossil Energy Research and Development

Much of DOE's Fossil Energy R&D Program focuses on technologies for use by coal-fired power plants. Major activities include Advanced Coal Energy Systems and Carbon Capture, Utilization, and Storage (CCUS); Natural Gas Technologies; and Unconventional Fossil Energy Technologies from Petroleum—Oil Technologies.

Advanced Coal Energy Systems includes R&D on modular coal-gasification systems, advanced turbines, solid oxide fuel cells, advanced sensors and controls, and power generation efficiency.

Elements of the CCUS program include the following:

- Carbon Capture subprogram for separating CO_2 in both precombustion and postcombustion systems;
- Carbon Utilization subprogram for R&D on technologies, including direct air capture, to convert carbon to marketable products, such as chemicals and polymers; and
- Carbon Storage subprogram on long-term geologic storage of CO_2, focusing on saline formations, oil and natural gas reservoirs, unmineable coal seams, basalts, and organic shales.[65]

For more information, see CRS In Focus IF11501, *Carbon Capture Versus Direct Air Capture*, by Ashley J. Lawson.

Strategic Petroleum Reserve

Authorized in 1975 by the Energy Policy and Conservation Act (P.L. 94-163, as amended; 42 U.S.C. §6201 et seq.), the SPR fulfills two statutory policy objectives: (1) reduce the economic impact of oil supply disruptions, and (2) carry out U.S. obligations under the Agreement on an

[65] DOE, *FY2021 Congressional Budget Justification*, vol. 3, part 2, February 2020, p. 195, https://www.energy.gov/sites/prod/files/2020/04/f73/doe-fy2021-budget-volume-3-part-2.pdf.

International Energy Program (IEP)—a multilateral agreement subject to international law. Currently, the SPR consists of a crude oil reserve in Texas and Louisiana and a smaller refined petroleum product reserve in several Northeastern states.

Since the SPR was established, its crude oil stocks have been used on three occasions in response to emergency oil supply disruptions. More frequently, SPR authorities have been used to exchange crude oil with refiners following natural disasters (i.e., hurricanes) and other regional supply disruption events.[66] The northeast gasoline supply reserve (NGSR)—established in 2014—has never been utilized.

With limited utilization in response to emergency oil supply disruptions, growing U.S. crude oil production, and rapidly declining net petroleum imports—one key metric used to determine IEP emergency oil stock obligations—Congress began requiring DOE to draw down and sell SPR crude oil to pay for other legislative priorities. Since 2015, Congress has enacted seven laws mandating the sale of 271 million barrels of crude oil. Additionally, Congress has required DOE to sell approximately $1.5 billion of SPR crude oil to pay for an SPR modernization program.[67]

Science and ARPA-E

The DOE Office of Science conducts basic research in six program areas: advanced scientific computing research, basic energy sciences, biological and environmental research, fusion energy sciences, high-energy physics, and nuclear physics. According to DOE's FY2021 budget justification, the Office of Science "is the Nation's largest Federal sponsor of basic research in the physical sciences and the lead Federal agency supporting fundamental scientific research for our Nation's energy future."[68]

DOE's Advanced Scientific Computing Research (ASCR) program focuses on developing and maintaining computing and networking capabilities for science and research in applied mathematics, computer science, and advanced networking. The program plays a key role in the DOE-wide effort to advance the development of exascale computing, which seeks to build a computer that can solve scientific problems 1,000 times faster than today's best machines. DOE has asserted that the department is on a path to have a capable exascale machine by the early 2020s.

Basic Energy Sciences (BES), the largest program area in the Office of Science, focuses on understanding, predicting, and ultimately controlling matter and energy at the electronic, atomic, and molecular levels. The program supports research in disciplines such as condensed matter and materials physics, chemistry, and geosciences. BES also provides funding for scientific user facilities (e.g., the National Synchrotron Light Source II, and the Linac Coherent Light Source-II), and certain DOE research centers and hubs (e.g., Energy Frontier Research Centers, as well as the Batteries and Energy Storage and Fuels from Sunlight Energy Innovation Hubs).

Biological and Environmental Research (BER) seeks a predictive understanding of complex biological, climate, and environmental systems across a continuum from the small scale (e.g., genomic research) to the large (e.g., Earth systems and climate). Within BER, Biological Systems

[66] For additional information about SPR releases, see U.S. Department of Energy, *History of SPR Releases*, at https://www.energy.gov/fe/services/petroleum-reserves/strategic-petroleum-reserve/releasing-oil-spr, accessed November 12, 2020.

[67] For additional information about congressionally required SPR oil sales, see *Strategic Petroleum Reserve: Mandated and Modernization Sales*, by Phillip Brown, a congressional distribution memo available to congressional clients by request from the author.

[68] DOE, *FY2021 Congressional Budget Justification*, vol. 4, February 2020, p, 7, https://www.energy.gov/sites/prod/files/2020/03/f72/doe-fy2021-budget-volume-4_0.pdf.

Science focuses on plant and microbial systems, while Biological and Environmental Research supports climate-relevant atmospheric and ecosystem modeling and research. BER facilities and centers include four Bioenergy Research Centers and the Environmental Molecular Science Laboratory at Pacific Northwest National Laboratory.

Fusion Energy Sciences (FES) seeks to increase understanding of the behavior of matter at very high temperatures and to establish the science needed to develop a fusion energy source. FES provides funding for the ITER project, a multinational effort to design and build an experimental fusion reactor.

The High Energy Physics (HEP) program conducts research on the fundamental constituents of matter and energy, including studies of dark energy and the search for dark matter. Nuclear Physics supports research on the nature of matter, including its basic constituents and their interactions. A major project in the Nuclear Physics program is the construction of the Facility for Rare Isotope Beams at Michigan State University.

Two significant research efforts in the Office of Science cut across multiple program areas: quantum information science, which aims to use quantum physics to process information, and artificial intelligence and machine learning, which use computerized systems that work and react in ways commonly thought to require intelligence.

A separate DOE office, the Advanced Research Projects Agency—Energy, was authorized by the America COMPETES Act (P.L. 110-69) to support transformational energy technology research projects. DOE budget documents describe ARPA-E's mission as overcoming long-term, high-risk technological barriers to the development of energy technologies.

For more details, see CRS Report R46341, *Federal Research and Development (R&D) Funding: FY2021*, coordinated by John F. Sargent Jr.

Loan Guarantees and Direct Loans

DOE's Loan Programs Office provides loan guarantees for projects that deploy innovative energy technologies, as authorized by Title 17 of the Energy Policy Act of 2005 (EPACT05, P.L. 109-58), direct loans for advanced vehicle manufacturing technologies, and loan guarantees for tribal energy projects. Section 1703 of EPACT05 authorized loan guarantees for advanced energy technologies that reduce greenhouse gas emissions, and Section 1705 authorized a temporary program through FY2011 for renewable energy and energy efficiency projects.

Title 17 allows DOE to provide loan guarantees for up to 80% of construction costs for eligible energy projects. Successful applicants must pay an up-front fee, or "subsidy cost," to cover potential losses under the loan guarantee program. Under the loan guarantee agreements, the federal government would repay all covered loans if the borrower defaulted. Such guarantees would reduce the risk to lenders and allow them to provide financing at below-market interest rates.

DOE currently has more than $40 billion in authority available to make direct loans and loan guarantees in the following categories:[69]

- Advanced Fossil Energy Projects Loan Guarantees, $8.5 billion;
- Advanced Nuclear Energy Projects Loan Guarantees, $10.9 billion;

[69] DOE, "Products and Services," as of April 23, 2020, https://www.energy.gov/lpo/title-xvii/products-services#innovativeenergy.

- Renewable Energy and Efficient Energy Projects Loan Guarantees, up to $4.5 billion;
- Advanced Technology Vehicles Manufacturing Loan Program, $17.7 billion in direct loan authority; and
- Tribal Energy Loan Guarantee Program, up to $2 billion in partial loan guarantee authority.

The only loan guarantees under Section 1703 have been $8.3 billion in guarantees provided to the consortium building two new nuclear reactors at the Vogtle plant in Georgia. DOE committed an additional $3.7 billion in loan guarantees for the Vogtle project on March 22, 2019.[70] Another nuclear loan guarantee is being sought by NuScale Power to build a small modular reactor in Idaho.[71]

Energy Information Administration

The U.S. Energy Information Administration was established within DOE as the lead federal agency for collecting, analyzing, and disseminating data on U.S. and world energy supply and consumption. EIA data collection spans the energy system from supply and transport to consumption. All energy sources are included in EIA's data and analysis products, though some (e.g., petroleum) are more detailed than others (e.g., renewables). The explanatory statement for the Consolidated Appropriations Act, 2021, directed DOE to submit a report to the House and Senate Appropriations Committees on improving EIA's energy modeling capabilities "to be able to simulate deep decarbonization scenarios, including economy-wide net-zero emissions policies." For more details, see CRS Report R46524, *The U.S. Energy Information Administration*, coordinated by Ashley J. Lawson.

Nuclear Weapons Activities

In the absence of explosive testing of nuclear weapons, the United States has adopted a science-based program to maintain and sustain confidence in the reliability of the U.S. nuclear stockpile. Congress established the Stockpile Stewardship Program in the National Defense Authorization Act for Fiscal Year 1994 (P.L. 103-160). The goal of the program, as amended by the National Defense Authorization Act for Fiscal Year 2010 (P.L. 111-84, §3111), is to ensure "that the nuclear weapons stockpile is safe, secure, and reliable without the use of underground nuclear weapons testing." The program is operated by NNSA, a semiautonomous agency within DOE established by the National Defense Authorization Act for Fiscal Year 2000 (P.L. 106-65, Title XXXII). NNSA implements the Stockpile Stewardship Program through the activities funded by the Weapons Activities account in the NNSA budget.

Most of NNSA's weapons 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 National Security Campus, MO; Pantex Plant, TX; Savannah River Site, SC; and Y-12 National Security Complex, TN); and the Nevada National Security Site (formerly the Nevada

[70] DOE, "Secretary Perry Announces Financial Close on Additional Loan Guarantees During Trip to Vogtle Advanced Nuclear Energy Project," news release, March 22, 2019, https://www.energy.gov/articles/secretary-perry-announces-financial-close-additional-loan-guarantees-during-trip-vogtle.

[71] NuScale Power, "NuScale Power, LLC Submits Part II of DOE Loan Guarantee Application," news release, September 6, 2017, http://newsroom.nuscalepower.com/press-release/nuscale-power-llc-submits-part-ii-doe-loan-guarantee-application. More information about DOE loans and loan guarantees is at the Loan Programs Office website, https://www.energy.gov/lpo/loan-programs-office.

Test Site). NNSA manages and sets policy for the weapons complex; contractors to NNSA operate the eight sites. Radiological activities at these sites are subject to oversight and recommendations by the independent Defense Nuclear Facilities Safety Board, funded by Title IV of the annual Energy and Water Development appropriations bill.

NNSA reorganized and renamed its program areas in its FY2021 budget request. The four main programs, each with a request of over $2 billion for FY2021, include the following:

- *Stockpile Management*, which contains many of the projects included in Directed Stockpile Work from previous years, supports work directly on nuclear weapons. These include life extension programs, warhead surveillance, maintenance, and other activities.
- *Stockpile Production* programs focus on maintaining and expanding the production capabilities for the components of nuclear weapons that are critical to weapons performance. According to NNSA, these include primaries, canned subassemblies, radiation cases, and non-nuclear components.
- *Stockpile Research, Technology, and Engineering* replaces the Research, Development, Test, and Evaluation program area. These programs provide the scientific foundation for science-based stockpile decisions.
- *Infrastructure and Operations* maintains, operates, and modernizes the NNSA infrastructure. It supports construction of new facilities and funds deferred maintenance in older facilities.

Nuclear Weapons Activities also has several smaller programs, including the following:

- *Secure Transportation Asset,* providing for safe and secure transport of nuclear weapons, components, and materials;
- *Defense Nuclear Security,* providing operations, maintenance, and construction funds for protective forces, physical security systems, personnel security, and related activities; and
- *Information Technology and Cybersecurity,* whose elements include cybersecurity, secure enterprise computing, and Federal Unclassified Information Technology.

For more information, see CRS Report R44442, *Energy and Water Development Appropriations: Nuclear Weapons Activities*, by Amy F. Woolf, and CRS Report R45306, *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*, by Amy F. Woolf and James D. Werner.

Defense Nuclear Nonproliferation

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 programs are administered by NNSA's Office of Defense Nuclear Nonproliferation (DNN).

The Materials Management and Minimization program conducts activities to minimize and, where possible, eliminate stockpiles of weapons-useable material around the world. Major activities include conversion of reactors that use highly enriched uranium (useable for weapons) to low-enriched uranium, removal and consolidation of nuclear material stockpiles, and disposition of excess nuclear materials.

Global Materials Security has three major program elements. International Nuclear Security focuses on increasing the security of vulnerable stockpiles of nuclear material in other countries. Radiological Security promotes the worldwide reduction and security of radioactive sources (typically used in medical and industrial devices), including the removal of surplus sources and substitution of technologies that do not use radioactive materials. Nuclear Smuggling Detection and Deterrence works to improve the capability of other countries to halt illicit trafficking of nuclear materials.

Nonproliferation and Arms Control works to "to support U.S. nonproliferation and arms control objectives to prevent proliferation, ensure peaceful nuclear uses, and enable verifiable nuclear reductions," according to the FY2021 DOE justification.[72] This program conducts reviews of nuclear export applications and technology transfer authorizations, implements treaty obligations, and analyzes nonproliferation policies and proposals.

National Technical Nuclear Forensics Research and Development (NTNF R&D) was proposed as a new NNSA program for FY2021, with the request moving $40 million for NTNF from the Nuclear Detonation Detection subprogram under Defense Nuclear Nonproliferation R&D. The full request was included in the enacted measure. The NTNF operational readiness mission had been located in the Department of Homeland Security. The budget request said that the NTNF program would allow NNSA to "take on a more active leadership role" in nuclear forensics. Another, existing DNN program, Nuclear Counterterrorism and Incident Response, carries out activities to "protect our nation and its citizens from nuclear terrorism and incidents or accidents involving the release of radiological material," according to the FY2021 budget justification.[73] Other DNN programs include R&D and Nonproliferation Construction.

For more information, see CRS Report R44413, *Energy and Water Development Appropriations for Defense Nuclear Nonproliferation: In Brief*, by Mary Beth D. Nikitin.

Cleanup of Former Nuclear Weapons Production and Research Sites

The development and production of nuclear weapons since the beginning of the Manhattan Project[74] during World War II resulted in a waste and contamination legacy managed by DOE that continues to present substantial challenges. DOE also manages legacy environmental contamination at sites used for nondefense nuclear research. In 1989, DOE established the Office of Environmental Management primarily to consolidate its responsibilities for the cleanup of former nuclear weapons production sites that had been administered under multiple offices.[75]

DOE's nuclear cleanup efforts are broad in scope and include the disposal of large quantities of radioactive and other hazardous wastes generated over decades; management and disposal of surplus nuclear materials; remediation of extensive contamination in soil and groundwater;

[72] DOE, *FY2021 Congressional Budget Justification*, vol. 1, p. 613, https://www.energy.gov/sites/prod/files/2020/03/f72/doe-fy2021-budget-volume-1_2.pdf.

[73] Ibid., p. 665.

[74] As described by the Manhattan Project National Historical Park, "The Manhattan Project was a massive, top secret national mobilization of scientists, engineers, technicians, and military personnel charged with producing a deployable atomic weapon during World War II. Coordinated by the US Army, Manhattan Project activities were located in numerous locations across the United States." The nuclear weapons activities begun by the Manhattan Project are now the responsibility of DOE. See National Park Service, Manhattan Project National Historical Park website, https://www.nps.gov/mapr/learn/historyculture/index.htm.

[75] In 1989, DOE created the Office of Environmental Restoration and Waste Management, which later was renamed the Office of Environmental Management.

decontamination and decommissioning of excess buildings and facilities; and safeguarding, securing, and maintaining facilities while cleanup is underway.[76] DOE's cleanup of nuclear research sites adds a nondefense component to EM's mission, albeit smaller in terms of the scope of their cleanup and associated funding.[77]

DOE has identified more than 100 separate sites in over 30 states that historically were involved in the production of nuclear weapons and nuclear energy research for civilian purposes.[78] These sites collectively encompass a land area of approximately 2 million acres. Cleanup remedies are in place and operational at the majority of these sites. Responsibility for their long-term stewardship has been transferred to the Office of Legacy Management and other offices within DOE for the operation and maintenance of cleanup remedies and monitoring.[79] Some of the smaller sites for which DOE initially was responsible were transferred to the Army Corps of Engineers in 1997 under the Formerly Utilized Sites Remedial Action Program. Once USACE completes the cleanup of a FUSRAP site, it is transferred back to DOE for long-term stewardship under the Office of Legacy Management, which is separate from EM and has its own DOE funding subaccount within Other Defense Activities.

Three appropriations accounts fund the Office of Environmental Management. The Defense Environmental Cleanup account is the largest in terms of funding, and it finances the cleanup of former nuclear weapons production sites. The Non-Defense Environmental Cleanup account funds the cleanup of federal nuclear energy research sites. Title XI of the Energy Policy Act of 1992 (P.L. 102-486) established the Uranium Enrichment Decontamination and Decommissioning Fund to pay for the cleanup of three federal facilities that enriched uranium for national defense and civilian purposes.[80] Those facilities are located near Paducah, KY; Piketon, OH (Portsmouth plant); and Oak Ridge, TN. DOE declared the cleanup of the Oak Ridge enrichment site complete on October 13, 2020.[81] Title X of P.L. 102-486 authorized the reimbursement of uranium and thorium producers for their costs of cleaning up contamination attributable to uranium and thorium sold to the federal government.[82]

The adequacy of funding for the Office of Environmental Management to attain cleanup milestones across the entire site inventory has been a recurring issue. Cleanup milestones are enforceable measures incorporated into compliance agreements negotiated among DOE, the Environmental Protection Agency, and the states. These milestones establish time frames for the completion of specific actions to satisfy applicable requirements at individual sites.

[76] The term "cleanup" often refers to the remediation of risks at a site. Cleanup may not necessarily entail the removal of all hazards from a site, but in some instances may involve the permanent containment of wastes or contamination to address exposure risks. If residual waste or contamination remains on-site after cleanup is complete, long-term stewardship may continue to monitor the site and ensure that cleanup measures continue to operate effectively.

[77] For additional information on the history, mission, and scope of the Office of Environmental Management, see the EM website: http://energy.gov/em/office-environmental-management.

[78] For a list of active and completed sites, see the EM "Cleanup Sites" web page and interactive map at http://energy.gov/em/cleanup-sites.

[79] The Office of Legacy Management administers the long-term stewardship of DOE sites that do not have a continuing mission once cleanup remedies are in place. Sites that have a continuing mission are transferred to the DOE offices that administer those missions, which are responsible for their long-term stewardship.

[80] 42 U.S.C. §2297g.

[81] DOE, Office of Environmental Management, "Workers Achieve Historic Cleanup of Uranium Enrichment Complex," news release, October 13, 2020, https://www.energy.gov/em/articles/workers-achieve-historic-cleanup-uranium-enrichment-complex.

[82] 42 U.S.C. §2296a.

Power Marketing Administrations

DOE's four Power Marketing Administrations were established to sell the power generated by various federal dams. Preference in the sale of power is given to publicly owned and cooperatively owned utilities. The PMAs operate in 34 states; their assets consist primarily of transmission infrastructure in the form of more than 33,000 miles of high voltage transmission lines and 587 substations. PMA customers are responsible for repaying all power program expenses, plus the interest on capital projects. Since FY2011, power revenues associated with the PMAs have been classified as discretionary offsetting receipts (i.e., receipts that are available for spending by the PMAs), thus the agencies are sometimes noted as having a "net-zero" spending authority. Only the capital expenses of the Western Area Power Administration (WAPA) and Southwestern Power Administration (SWPA) are supported by appropriations from Congress.

For more information, see CRS Report R45548, *The Power Marketing Administrations: Background and Current Issues*, by Richard J. Campbell.

Independent Agencies

Independent agencies that receive funding in Title IV of the Energy and Water Development bill include the Nuclear Regulatory Commission (NRC), the Appalachian Regional Commission (ARC), and the Defense Nuclear Facilities Safety Board. NRC is by far the largest of the independent agencies, with a total budget of nearly $900 million. However, as noted in the description of NRC below, about 90% of NRC's budget is offset by fees, so that the agency's net appropriation is less than half of the total funding in Title IV. NRC and ARC are discussed in more detail below. The recent appropriations history for all the Title IV agencies is shown in **Table 8**.

Table 8. Independent Agencies Funded by Energy and Water Development Appropriations

(budget authority in millions of current dollars)

Program	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp.
Appalachian Regional Commission	165.0	175.0	165.0	175.0	180.0	180.0
Nuclear Regulatory Commission	*911.0*	*855.6*	*863.4*	*863.4*	*863.4*	*844.4*
(Revenues)	*-780.8*	*-728.1*	*-740.4*	*-740.4*	*-740.4*	*-721.4*
Net NRC (including Inspector General)	130.1	127.5	123.0	123.0	123.0	123.0
Defense Nuclear Facilities Safety Board	31.0	31.0	28.8	31.0	31.0	31.0
Nuclear Waste Technical Review Board	3.6	3.6	3.6	3.6	3.6	3.60
Denali Commission	15.0	15.0	7.3	15.0	15.0	15.0
Delta Regional Authority	25.0	30.0	2.5	15.0	30.0	30.0
Northern Border Regional Commission	20.0	25.0	0.9	25.0	30.0	30.0
Southeast Crescent Regional Commission	0.3	0.3	0	1.0	0	1.0
Southwest Border Regional Commission				0.3	0	0.3
Total	**390.0**	**407.3**	**333.1**	**388.9**	**412.6**	413.9

Sources: Explanatory statement for H.R. 133, 116th Congress; FY2021 Senate Appropriations Committee majority draft; H.R. 7617; H.Rept. 116-449; FY2021 President's Request; Explanatory Statement for Division C of H.R. 1865, 116th Congress; S.Rept. 116-102; S. 2470; H.R. 2740; CBO Current Status Report; H.Rept. 116-83; H.Rept. 115-929; S.Rept. 115-258; S.Rept. 115-132; H.Rept. 115-230; P.L. 115-31 and explanatory statement.

Note: Columns may not sum to totals because of rounding.

Appalachian Regional Commission

Established in 1965,[83] the Appalachian Regional Commission (ARC) is a regional economic development agency. It awards grants and contracts to state and local governments and nonprofit organizations to foster economic opportunities, improve workforce skills, build critical infrastructure, strengthen natural and cultural assets, and improve leadership skills and capacity in the region. ARC's authorizing statute defines the Appalachian Region as including all of West Virginia and parts of Alabama, Georgia, Kentucky, Maryland, Mississippi, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, and Virginia. More than 25 million people currently live in the region as defined.

ARC provides funding to several hundred projects each year, with particular focus on the region's most economically distressed counties. Major areas of infrastructure support include broadband communication systems, transportation, and water and wastewater systems. ARC has supported development of the Appalachian Development Highway System (ADHS), a planned 3,000-mile system of highways that connect with the U.S. Interstate Highway System. According to ARC, 90.8% of ADHS is "complete, open to traffic, or under construction."[84]

[83] Appalachian Regional Development Act of 1965, P.L. 89-4.

[84] For more information, see ARC home page at https://www.arc.gov.

Since FY2016, Congress has appropriated approximately $50 million per year as a set-aside for ARC's POWER Initiative (Partnerships for Opportunity and Workforce and Economic Revitalization), which assists communities impacted by the decline of the coal industry. The POWER Initiative funds a variety of economic, workforce, and community development projects to stabilize and stimulate economic activity in affected communities.

For more background on ARC and other regional commissions and authorities, see CRS Report R45997, *Federal Regional Commissions and Authorities: Structural Features and Function*, by Michael H. Cecire, and CRS In Focus IF11140, *Federal Regional Commissions and Authorities: Overview of Structure and Activities*, by Michael H. Cecire.

Nuclear Regulatory Commission

NRC is an independent agency that establishes and enforces safety and security standards for nuclear power plants and users of nuclear materials. Major appropriations categories for NRC are shown in **Table 9**. Nuclear Reactor Safety is NRC's largest program and is responsible for licensing and regulating the U.S. fleet of 94 power reactors, plus two under construction. NRC is also responsible for licensing and regulating nuclear waste facilities, such as the proposed underground nuclear waste repository at Yucca Mountain, NV (for which no funding was requested or provided for FY2021).

NRC is required by law to offset its total budget, excluding specified items, through fees charged to nuclear reactor owners and other holders of NRC licenses. Budget items excluded from fee recovery include prior-year balances, development of advanced reactor regulations, international activities, and generic homeland security. As a result, NRC's net appropriation for FY2021 is about 15% of the agency's total budget.

Table 9. Nuclear Regulatory Commission Funding Categories

(budget authority in millions of current dollars)

Funding Category	FY2018 Approp.	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 House	FY2021 Sen. Comm. Major. Draft	FY2021 Approp.
Nuclear Reactor Safety	462.6	469.8	447.6	452.9	452.9	452.8	452.8
Nuclear Materials and Waste Safety	113.0	108.6	103.2	102.9	102.9	102.9	102.9
Decommissioning and Low-Level Waste	27.1	25.4	22.9	22.8	22.8	22.8	22.8
Yucca Mountain Licensing	0.1	0	0	0	0	0	0
Corporate Support	296.4	299.6	292.6	271.4	271.4	271.4	271.4
Integrated University Program	15.5	15.0	16.0	0	16.0	16.0	16.0
Prior-Year Balances		-20	-40.0		-16.0	-16.0	-35.0
Inspector General	13.3	12.6	13.3	13.5	13.5	13.5	13.5
Total	**922.0**	**911.0**	**855.6**	**863.4**	**863.4**	**863.4**	**844.4**

Source: Explanatory statement for H.R. 133, 116th Congress; FY2021 Senate Appropriations Committee majority draft; H.R. 7617; H.Rept. 116-449; NRC FY2021 Budget Justification; Explanatory Statement for Division

C of H.R. 1865, 116th Congress; S.Rept. 116-102; H.R. 2740; H.Rept. 116-83; H.Rept. 115-929, NRC FY2020 Budget Justification; H.Rept. 115-697; S.Rept. 115-258.

Note: Fee offsets and some adjustments are excluded.

Congressional Hearings

The following hearings were held by the Energy and Water Development subcommittees of the House and Senate Appropriations Committees on the FY2021 budget request. Testimony and opening statements are posted on most of the web pages cited for each hearing, along with webcasts in many cases.

House

- *Department of Energy*, February 27, 2020, https://appropriations.house.gov/events/hearings/department-of-energy-budget-request-for-fy2021.
- *DOE Applied Energy Programs*, March 3, 2020, https://appropriations.house.gov/events/hearings/department-of-energy-applied-energy-programs-budget-requests-for-fy2021.
- *DOE National Nuclear Security Administration*, March 4, 2020, https://appropriations.house.gov/events/hearings/department-of-energynational-nuclear-security-administration.
- *Corps of Engineers and Bureau of Reclamation*, March 10, 2020, https://appropriations.house.gov/events/hearings/us-army-corps-of-engineers-and-bureau-of-reclamation-budget-requests-for-fy2021.
- *DOE Advanced Research Projects Agency—Energy, Office of Science, and Environmental Management*, March 11, 2020, https://appropriations.house.gov/events/hearings/department-of-energy-fy2021-budget-request-for-advanced-research-projects-agency.

Senate

- *Department of Energy*, March 4, 2020, https://www.appropriations.senate.gov/hearings/review-of-the-fy2021-budget-request-for-the-us-department-of-energy.
- *U.S. Army Corps of Engineers and the Bureau of Reclamation*, March 11, 2020, https://www.appropriations.senate.gov/hearings/review-of-the-fy2021-budget-request-for-us-army-corps-of-engineers-and-bureau-of-reclamation-within-dept-of-interior.

Author Information

Mark Holt
Specialist in Energy Policy

Corrie E. Clark
Analyst in Energy Policy

Acknowledgments

Former CRS Research Assistant Danielle A. Arostegui developed the spreadsheet used for appropriations analysis in this report.

Key Policy Staff

Area of Expertise	Name
General (Coordinator)	Mark Holt
Corps of Engineers	Anna Normand Nicole Carter
Bureau of Reclamation	Charles V. Stern
Renewable energy	Corrie E. Clark
Energy efficiency	Corrie E. Clark
Fossil energy research	Ashley Lawson
Strategic Petroleum Reserve	Phillip Brown
Nuclear energy	Mark Holt
Science and ARPA-E Quantum Information Science Artificial intelligence	Daniel Morgan Patricia Moloney Figliola Laurie A. Harris
Nuclear weapons stewardship	Amy Woolf
Nonproliferation	Mary Beth Nikitin
DOE Environmental Management	David Bearden Lance Larson
Power Marketing Administrations	Charles V. Stern
Bonneville Power Administration	Charles V. Stern
Federal regional authorities and commissions	Michael H. Cecire Alyssa R. Casey
Appropriations legislative procedures	James V. Saturno Bill Heniff Megan Lynch

Disclaimer