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Energy and Water Development: FY2022 Appropriations

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SUMMARY

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Energy and Water Development: FY2022 Appropriations

The Energy and Water Development and Related Agencies appropriations bill funds 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. Energy and Water Development appropriations for FY2022 were enacted as part of the Consolidated Appropriations Act, 2022 (P.L. 117-103, Division D), signed by President Biden on March 15, 2022.

Overall Funding Totals

The enacted FY2022 appropriations for energy and water development agencies total $55.576 billion, excluding adjustments. The enacted amount is $103 million (less than 1%) above the President's request and $6.051 billion (12%) above the FY2021 enacted amount. The FY2022 energy and water development funding in the Consolidated Appropriations Act was bolstered by $41.921 billion in FY2022 appropriations in the energy and water development titles of the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) and the Disaster Relief Supplemental Appropriations Act, 2022 (P.L. 117-43).

President Biden formally submitted his FY2022 budget proposal to Congress on May 28, 2021. The House Appropriations Committee approved the FY2022 Energy and Water Development funding bill on July 16, 2021, by a 33-24 vote (H.R. 4549, H.Rept. 117-98). The bill was combined in a "minibus" with six other appropriations bills (H.R. 4502), which passed the House on July 29, 2021, by a vote of 219-208. The Senate Appropriations Committee approved its FY2022 Energy and Water Development funding bill on August 4, 2021, by a 25-5 vote (S. 2605, S.Rept. 117-36).

Energy and Water Development Appropriations, FY2021 Enacted Through FY2022 Enacted
Dollars in millions (and % change)

Agency	FY2021 Enacted	FY2022 Request (% Change from FY2021)	FY2022 House (% Change from FY2021)	FY2022 Senate Committee (% Change from FY2021)	FY2022 Enacted (% Change from FY2021)
Corps of Engineers	7,795	6,793 (-13%)	8,660 (+11%)	8,960 (+15%)	8,343 (+7%)
Bureau of Reclamation/CUP	1,691	1,553 (-8%)	1,966 (+16%)	2,007 (+19%)	1,924 (+14%)
Department of Energy	39,625	46,646 (+18%)	45,458 (+15%)	45,324 (+14%)	44,856 (+13%)
Independent Agencies	414	481 (+16%)	460 (+11%)	461 (+11%)	454 (+10%)
Total	49,525	55,473 (+12%)	56,208 (+13%)	56,866 (+15%)	55,576 (+12%)

Source: S.Rept. 117-36, H.Rept. 117-98, H.R. 4502, Explanatory Statement of the Consolidated Appropriations Act, 2022.

Notes: Totals exclude budget scorekeeping adjustments. CUP=Central Utah Project Completion Account. Enacted amounts do not include emergency supplemental appropriations.

Major Issues

Congressional debate and enactment of Energy and Water Development appropriations for FY2022 included several major initiatives and issues. Some examples include the following:

- *Congressionally Directed Funding*. Congressionally directed funding for site-specific projects (community project funding) is included in the enacted FY2022 appropriations, following an "earmark moratorium" during the 112th to the 116th Congresses.

- *Western Drought*. As of early May 2022, 94% of the western United States was experiencing some level of drought. The Administration proposed additional funding for several Reclamation drought response-related activities, and the enacted appropriations for FY2022 included targeted increases to support response to drought conditions.
- *Increased Funding for Renewable Energy and Energy Efficiency*. The Biden Administration proposed a 65% increase in the DOE Energy Efficiency and Renewable Energy (EERE) appropriations account, following four years of steep reductions proposed by the Trump Administration. The Consolidated Appropriations Act provided $3.200 billion for EERE for FY2022, $1.532 billion (32%) below the request but $338 million (12%) above the FY2021 enacted amount. This amount was in addition to $8.207 billion appropriated by IIJA for EERE in FY2022.
- *Establishment of Office of Clean Energy Demonstration*. The Administration requested $400 million for this new office to "support a multi-year series of competitive solicitations in collaboration with the private sector to conduct demonstrations." The Consolidated Appropriations Act provided $20 million, which was in addition to $5.127 billion appropriated by IIJA for the new office in FY2022.

Contents

Figures

Tables

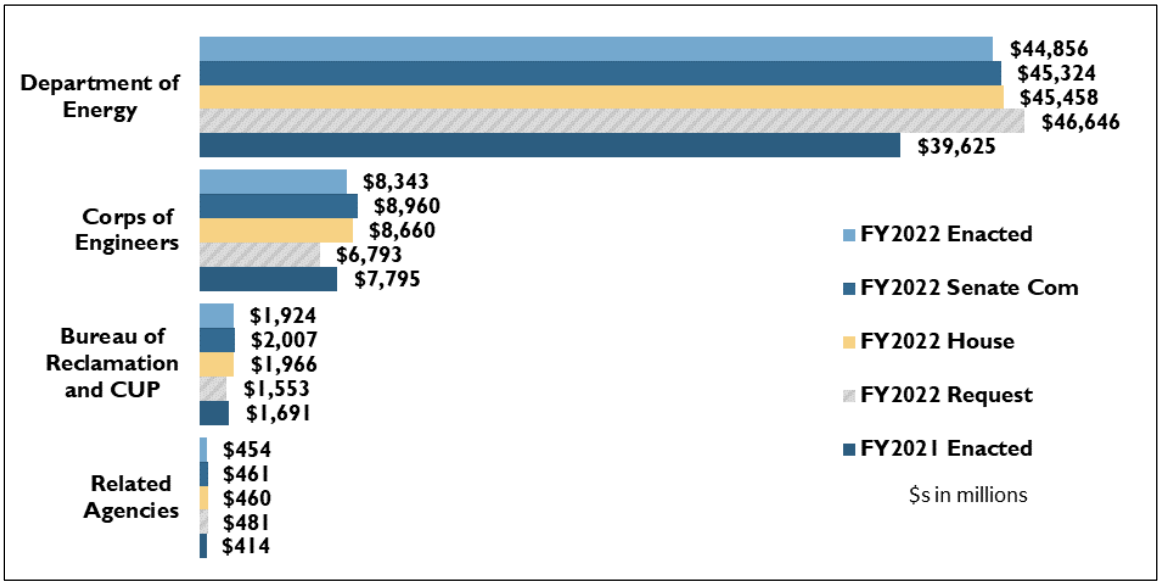
Contacts

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 FY2021 through FY2022.

Figure 1. Funding for Major Components of Energy and Water Development Appropriations Bill, FY2021 Through FY2022

(excluding emergency supplementals)



Sources: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.R. 4502; H.Rept. 117-98; Administration budget request for FY2022; 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.

President Biden formally submitted his FY2022 budget proposal to Congress on May 28, 2021. The total request for agencies included in the Energy and Water Development appropriations bill was $55.473 billion, excluding budget scorekeeping adjustments.[1] This is $5.948 billion (12%) above the FY2021 enacted Energy and Water Development appropriations total of $49.525 billion. The House Appropriations Committee approved the FY2022 Energy and Water Development appropriations bill on July 16, 2021 (H.R. 4549, H.Rept. 117-98); the measure was included as Division C in a seven-bill "minibus" (H.R. 4502) passed by the House, 219-208, on

[1] 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. Scorekeeping adjustments are separate from emergency appropriations, which are outside of annual budget caps.

July 29, 2021. The Senate Appropriations Committee approved its FY2022 Energy and Water Development funding bill on August 4, 2021, by a 25-5 vote (S. 2605, S.Rept. 117-36).

Energy and Water Development appropriations for FY2022 were enacted as part of the Consolidated Appropriations Act, 2022 (P.L. 117-103, Division D), passed by the House on March 9, 2022, and by the Senate March 10, 2022, and signed by President Biden March 15, 2022. The enacted energy and water development funding totals $55.576 billion, excluding adjustments. The enacted amount is $103 million (less than 1%) above the President's request and $6.051 billion (12%) above the FY2021 enacted amount.[2]

The FY2022 energy and water development funding in the Consolidated Appropriations Act was bolstered by $41.921 billion in FY2022 appropriations in the energy and water development titles of the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) and the Disaster Relief Supplemental Appropriations Act, 2022 (P.L. 117-43). That funding brought total FY2022 appropriations for energy and water development programs to $97.497 billion. P.L. 117-58 and P.L. 117-43 also provided advance energy and water development appropriations for future fiscal years totaling $53.851 billion.

FY2021 Energy and Water Development funding was provided by Division D of the Consolidated Appropriations Act, 2021 (P.L. 116-260), signed by President Trump on December 27, 2020. The enacted Energy and Water appropriations totaled $1.201 billion (2%) above the FY2020 enacted level, including rescissions.

Administration Request

DOE would have received $46.646 billion under the Administration's FY2022 budget request (excluding offsets)—an increase of $7.021 billion (18%) from the FY2021 enacted amount. The FY2022 request for Energy Efficiency and Renewable Energy (EERE) was $4.732 billion, which is $1.870 billion (65%) above the FY2021 enacted level. This included a proposed $300 million Build Back Better Challenge Grant program to encourage new approaches to clean energy technology deployment. Nuclear Energy would have increased from $1.508 billion in FY2021 to $1.851 billion in FY2022 (23%), and the Fossil Energy and Carbon Management account (FECM), previously Fossil Energy R&D, would have increased by $140 million to $890 million (19%). DOE's Office of Science, which funds a wide range of research, was to receive $7.440 billion, up $414 million (6%) from the FY2021 enacted level. Funding for the Advanced Research Projects Agency—Energy (ARPA-E), which received $427 million in FY2021, would have increased to $500 million in FY2022 (up 17%), and a new Advanced Research Projects Agency–Climate (ARPA-C) was to be established with FY2022 funding of $200 million. The budget request included $400 million to establish the Office of Clean Energy Demonstration, which was proposed to accelerate "the maturation of near- and mid-term clean energy technologies and systems."[3] Environmental Management (waste management and cleanup) would have increased from $7.586 billion in FY2021 to $7.596 billion in FY2022 (up $10 million, about a tenth of 1%).

The National Nuclear Security Administration (NNSA), the DOE agency responsible for defense-related nuclear activities, was to increase slightly under the Administration request, from $19.732

[2] Most figures in this report are taken from the Explanatory Statement for H.R. 2471, the Consolidated Appropriations Act, 2022, Division D, *Congressional Record*, p. H2184, March 9, 2022, https://www.congress.gov/117/crec/2022/03/09/168/42/CREC-2022-03-09-bk3.pdf.

[3] DOE, *Budget in Brief*, June 2021, p. 90, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-in-brief-v4.pdf.

billion in FY2021 to $19.743 billion in FY2022 (up $11 million, or less than 1%). Also proposed for increases were DOE's Office of Electricity (up $115 million, or 54%) and the Office of Cybersecurity, Energy Security, and Emergency Response (CESER), which was to take over responsibility for the Strategic Petroleum Reserve (up $45 million, or 29%).

The two water agencies in the Energy and Water Development appropriations bill were to receive funding reductions under the FY2022 budget request. Discretionary appropriations in the Energy and Water bill for USACE were to decline from $7.795 billion in FY2021 to $6.793 billion in FY2022 (down $1.003 billion, or 13%). The requested funding included four new construction projects and seven new project studies (these projects and studies are referred to as new starts). Reclamation (separately from CUP) was to be reduced from $1.670 billion in FY2021 to $1.533 billion in FY2022 (down $137 million, or 8%).

Among the independent agencies funded by the bill, the Nuclear Regulatory Commission (NRC) was set to receive an increase in total appropriations from $844 million in FY2021 to $888 million in FY2022 (up $43 million, or 5%). NRC's budget is mostly offset by nuclear industry fees, which may vary from year to year; the Administration proposed an increase in the agency's net appropriation from $123 million in FY2021 to $131 million in FY2022 (up $8 million, or 7%). Funding for the Appalachian Regional Commission would have increased from $180 million in FY2021 to $235 million in FY2022 (up $55 million, or 31%). Requested funding for smaller regional authorities in the bill varied widely: Denali Commission (up 1%), Delta Regional Authority (no change), Northern Border Regional Commission (up less than 1%), Southeast Crescent Regional Commission (up 150%), and Southwest Border Regional Commission (up 900%).

House-Passed Bill

The House-passed FY2022 Energy and Water Development appropriations bill (Division C of H.R. 4502) included total funding of $56.208 billion, which was reduced by $2.982 billion in budget scorekeeping adjustments to $53.225 billion. The House Appropriations Committee approved the measure on July 16, 2021, by a vote of 33-24 (H.R. 4549, H.Rept. 117-98).

DOE would have received $45.458 billion in the House-passed bill, which was $5.830 billion (15%) above the FY2021 enacted amount and $1.525 billion (3%) below the Administration's request (all figures excluding rescissions). The bill included $3.776 billion for Energy Efficiency and Renewable Energy, $914 million (32%) above the enacted FY2021 level and $956 million (20%) below the Administration request. The Administration's proposed ARPA-C was not funded in the House bill; the existing ARPA-E was to receive $100 million above the request (for a total of $600 million) to fund some of the climate-related technologies proposed for ARPA-C, according to the Appropriations Committee report. NNSA would have received $20.155 billion in the House bill, $423 million (2%) above the FY2021 enacted level and $412 million (2%) above the Administration request.

The FY2022 House-passed bill would have provided substantial increases over the FY2021 enacted levels for USACE and Reclamation, in contrast to the reductions proposed by the Administration. USACE was to receive $8.660 billion, an increase of $865 million (11%) over the FY2021 appropriation and $1.867 billion (27%) above the Administration request. Reclamation and CUP would have received $1.966 billion, $275 million (16%) over FY2021 and $413 million (27%) more than sought by the Administration. For the first time since the 111th Congress, the House bill also included 86 earmarks for USACE and 9 for Reclamation projects.

Senate Appropriations Committee-Reported Bill

The Senate Appropriations Committee's FY2022 Energy and Water Development funding bill recommended a total of $56.416 billion, excluding emergency spending but including rescissions.[4] That total was further reduced by budget scorekeeping adjustments to $53.625 billion.[5] The committee approved the measure on August 4, 2021, by a vote of 25-5 (S. 2605, S.Rept. 117-36).

The Senate committee bill would have given DOE $45.324 billion (excluding rescissions), which was $5.697 billion (14%) above the FY2021 enacted level and $1.659 billion (4%) below the Administration FY2022 request. Energy Efficiency and Renewable Energy would have received $3.897 billion, $1.035 billion (36%) above the FY2021 enacted level and $835 million (18%) below the request. As in the House bill, the Senate committee recommended no funding for the proposed ARPA-C, but no appropriations above the request for ARPA-E were included for ARPA-C activities. The Senate committee bill included $100 million for the Office of Clean Energy Demonstration, 25% of the amount requested and half the amount in the House bill. NNSA would have received $20.042 billion under the Senate committee bill, 2% above the request and 1% below the House amount.

Water agencies were recommended for increases in the Senate committee bill over both the request and the House-passed levels. FY2022 funding for USACE would have totaled $8.960 billion, 32% above the request and 3% above the House-passed amount. Reclamation and CUP would have received $2.007 billion under the Senate committee bill, 29% above the request and 2% above the House level. The Senate committee bill included 126 earmarks for USACE and 12 for Reclamation, as well as more than five dozen for DOE: 3 for CESER, 54 for EERE, 3 for OE, and 6 for Fossil Energy and Carbon Management.

Consolidated Appropriations Act, 2022

The enacted FY2022 appropriations for energy and water development agencies in the Consolidated Appropriations Act (P.L. 117-103) total $55.576 billion, excluding adjustments. The enacted amount is $103 million (less than 1%) above the President's request, $1.290 billion below the Senate committee level (-2%), $967 million below the House level (-2%), and $6.051 billion (12%) above the FY2021 enacted amount.

Energy Efficiency and Renewable Energy was appropriated $3.200 billion, $1.532 billion below the request (-32%) but $338 million (12%) above the FY2021 enacted amount. ARPA-E received $450 million, $50 million below the request (-10%), but $23 million (5%) above the FY2021 level, and the proposed ARPA-C was not funded. The new Office of Clean Energy Demonstration was appropriated $20 million, $380 million below the request (-95%). However, the office had already been appropriated $21.456 billion for FY2022-FY2025 by IIJA. NNSA was appropriated a total of $20.656 billion, $913 million (5%) above the request and about the same increase from the FY2021 enacted level.

Water agencies received increases over the FY2022 request. USACE received $8.343 billion, $1.551 billion (23%) above the request and $548 million (7%) above the FY2021 enacted amount. Reclamation was appropriated $1.901 billion, $368 million (24%) above the request and $231 million (14%) above the enacted FY2021 level. In addition, USACE received FY2022

[4] The "grant total," including $450 million in emergency spending, is $56.866 billion. Total appropriations, without $336 million in rescissions, is $56.752 million. Senate Appropriations Committee, S.Rept. 117-36, pp. 181-182.

[5] Senate Appropriations Committee, S.Rept. 117-36, p. 4.

supplemental appropriations of $5.711 billion in P.L. 117-43 and FY2022 emergency appropriations of $14.969 billion in P.L. 117-58. Reclamation received an additional $210 million in P.L. 117-43 and $1.660 billion in P.L. 117-58. The Explanatory Statement included 236 earmarks for Energy and Water Development agencies and programs: 156 for USACE, 15 for Reclamation, 2 for CESER, 54 for EERE, 3 for Electricity, and 6 for FECM.

FY2021 Enacted Funding

Division D of the Consolidated Appropriations Act, 2021 (P.L. 116-260) provided $39.627 billion for DOE (excluding offsets), which was $970 million (3%) above the FY2020 enacted 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 $7.795 billion for FY2021, $145 million (2%) above the FY2020 enacted amount. 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. The Southwest Border Regional Commission received its first funding ($250,000).[6]

For more details, see CRS In Focus IF11462, *Army Corps of Engineers: FY2021 Appropriations*, by Anna E. Normand and Nicole T. Carter; and CRS Report R46384, *Energy and Water Development: FY2021 Appropriations*, by Mark Holt and Corrie E. Clark.

FY2022 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 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.

The House passed a "deeming resolution" (H.Res. 467) on June 14, 2021, to set a FY2022 discretionary appropriations total of $1.506 trillion, which would accommodate the Administration's $1.5 trillion request. The House Appropriations Committee on July 16, 2021, issued a report with suballocations of the FY2022 discretionary total (H.Rept. 117-91), pursuant to section 302(b) of the Congressional Budget Act of 1974. The 302(b) allocation for the Energy and Water Development Subcommittee is $53.226 billion, the amount provided by the House Appropriations Committee after budget scorekeeping adjustments.

The Senate Appropriations Committee approved the Energy and Water Development appropriations bill without discretionary spending allocations, because the Senate had not yet passed an FY2022 budget resolution. The Senate passed the budget resolution on August 11, 2021 (S.Con.Res. 14), which "assumes discretionary levels as proposed in President Biden's budget request."[7] On August 24, 2021, the House passed H.Res. 601, which included the adoption of

[6] For information on this and other regional commissions, see CRS Report R45997, *Federal Regional Commissions and Authorities: Structural Features and Function*, by Julie M. Lawhorn.

[7] Senate Budget Committee, *Concurrent Resolution on the Budget, Fiscal Year 2022*, S. Prt. 117-16, August 2021, p. 6,

S.Con.Res. 14. House and Senate negotiators reached agreement on the FY2022 discretionary appropriations allocations on February 9, 2022, clearing the way for final drafting and approval of the Consolidated Appropriations Act, 2022 (P.L. 117-103).[8] The additional FY2022 funding in IIJA and Supplemental Appropriations Act were designated as emergency spending and not subject to the discretionary cap. Harbor Maintenance Trust Fund appropriations are also outside the cap.

Funding Issues and Initiatives

Several issues drew particular attention during congressional consideration of Energy and Water Development appropriations for FY2022. 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.

Congressionally Directed Funding

The 117th Congress included earmarks for site-specific projects in the FY2022 appropriations process. (These were referred to as "community project funding" in the House and "congressionally directed spending" in the Senate.) From the 112th through the 116th Congresses, moratorium policies limited earmarks for such projects. Funding for specific water projects constitutes the majority of the annual budget request for USACE and Reclamation; during the moratorium, Congress appropriated funding above the requested amounts for categories of work without identifying specific projects.

The Explanatory Statement included 236 earmarks for Energy and Water Development agencies and programs: 156 for USACE, 15 for Reclamation, 2 for CESER, 54 for EERE, 3 for Electricity, and 6 for FECM.

Higher Funding for Water Projects

The FY2022 Consolidated Appropriations Act included funding increases for USACE and Reclamation over the FY2021 enacted levels, although the Administration had sought reductions. For USACE, the enacted increase was $548 million (7%) over the FY2021 level.[9] Congress provided 55% of FY2022 USACE annual appropriations through the O&M account, which included an increase of $720 million (19%) in FY2022 compared with FY2021. Reclamation received an increase of $231 million (14%) over the FY2021 level.[10]

In the Explanatory Statement, Congress provided USACE and Reclamation funds for the President's requested studies and projects and for geographically specific studies and projects that were requested by Members of Congress (i.e., community project funding/congressionally

https://www.budget.senate.gov/imo/media/doc/CPRT-117SPRT45298.pdf.

[8] House Committee on Appropriations, "DeLauro and Leahy Announce Bipartisan Appropriations Framework," press release, February 9, 2022, https://appropriations.house.gov/news/press-releases/delauro-and-leahy-announce-bipartisan-appropriations-framework.

[9] The House bill would have increased USACE funding by $864 million (11%) and the Senate committee recommended an increase of $1.165 billion (15%) over FY2021 enacted levels.

[10] Reclamation would have seen an increase of $276 million (17%) under the House-passed bill over FY2021 and $316 million (19%) under the Senate committee recommendation.

directed spending, CPF/CDS). The Explanatory Statement also included additional funding for selected categories of projects under USACE's Investigations, Construction, Mississippi River and Tributaries, and Operation and Maintenance accounts and under Reclamation's Water and Related Resources account for the agencies to make additional project-level allocations in work plans to be delivered to Congress after enactment.

While previous presidential budgets requested no or limited new starts, the Administration proposed seven new studies and four new construction projects (new starts) for USACE in FY2022. The FY2022 Energy and Water Development enacted measure funded the new starts proposed by the Administration and a limited number of additional new starts in the Investigations, Construction, and Mississippi River and Tributaries accounts.

Under the enacted measure, Harbor Maintenance Trust Fund projects received an estimated $2.05 billion, an increase of $370 million above FY2021 and $424 million above the request. The enacted measure provided these funds in accordance with the budgetary adjustments made by the CARES Act (P.L. 116-136) and the Water Resources Development Act of 2020 (P.L. 116-260, Division AA), in which they are not counted against annual discretionary budget caps.

For more details, see CRS In Focus IF11846, *Army Corps of Engineers: FY2022 Appropriations*, by Anna E. Normand and Nicole T. Carter; and CRS In Focus IF11855, *Bureau of Reclamation: FY2022 Appropriations*, by Charles V. Stern.

Western Drought

As of May 31, 2022, approximately 93% of the western United States was experiencing some level of drought.[11] The Administration proposed additional funding (compared to recent requests) for several of Reclamation's drought-related programs, such as the Drought Response Program, the WaterSMART Water and Energy Conservation Grants Program, and the Title XVI Water Reuse and Recycling Program.[12] Demand for these programs, which have the potential to help conserve water and alleviate water supply shortages, is likely to be pronounced as a result of the current drought; thus some in Congress support additional funding for them. The drought has also led some members to argue for more funding for the construction of new water storage projects in the West pursuant to Reclamation's authorities under Section 4007 of the Water Infrastructure Improvements for the Nation Act (WIIN ACT; P.L. 114-322).[13] The executive branch typically requests no such funding in the budget; Congress has added funding for this authority in every year since FY2017.

The FY2022 Energy and Water Development appropriations bill passed by the House included a number of targeted drought-related funding increases in addition to the budget request, including $67 million for new western water storage projects under Section 4007 of the WIIN Act and $50 million for projects to create or conserve Colorado River water pursuant to the Lower Colorado River Drought Contingency Plan. The House bill also included $8.5 million in addition to the Administration request for the Drought Response Program.

[11] U.S. Drought Monitor, Western U.S. Percent Area in Drought as of May 31, 2022, https://droughtmonitor.unl.edu/DmData/DataGraphs.aspx.

[12] More information on these programs, see the Bureau of Reclamation WaterSMART website at https://www.usbr.gov/watersmart/.

[13] For more information on these projects, see CRS In Focus IF10626, *Reclamation Water Storage Projects: Section 4007 of the Water Infrastructure Improvements for the Nation Act*, by Charles V. Stern.

The Senate Appropriations Committee bill also included funds for western drought relief, and the committee directed USACE to "prioritize any authorized projects that would alleviate water supply issues in areas that have been afflicted by severe droughts in the last four fiscal years."[14] Other specific funding in the bill included $134 million for new western water storage projects under Section 4007 of the WIIN Act, $40 million for Lower Colorado River Drought Contingency Plan projects, and $8.5 million in addition to the Administration request for the Drought Response Program.

The Consolidated Appropriations Act funded most of these drought-related programs, including $117 million for western water storage projects, $25 million for Drought Contingency Plan projects in the Lower Colorado River Basin, and $20 million for the Drought Response Program. Notably, this funding was additive to $200 million in drought funding that Congress approved in earlier FY2022 appropriations legislation.[15]

Energy Efficiency and Renewable Energy Funding Increases

Following four years of steep reductions proposed by the Trump Administration (but not approved by Congress), the Biden Administration proposed a 65% increase in the DOE Energy Efficiency and Renewable Energy (EERE) appropriations account—from $2.862 billion in FY2021 to $4.732 billion in FY2022. Programs with the largest requested increases were the Federal Energy Management Program ($438 million, up 995%), State Energy Program ($300 million, up 480%), Wind Energy Technologies ($205 million, up 86%), Geothermal Technologies ($164 million, up 55%), Vehicle Technologies ($595 million, up 49%), Advanced Manufacturing ($551 million, up 39%), and Solar Energy Technologies ($387 million, up 38%). The Administration also proposed a Build Back Better Challenge Grants initiative to award $300 million in competitive block grants to states, territories, and tribes to accelerate clean energy deployment. The request included an unspecified amount of funding for "programmatic infrastructure" to support the Administration's proposed Energy Efficiency Clean Electricity Standard, which would require legislative authorization.

The FY2022 Energy and Water Development funding bills passed by the House and approved by the Senate Appropriations Committee also included increases from FY2021 for EERE, but only about half the level of increases requested by the Administration. The House bill would provide $3.768 billion for EERE, including $100 million for Build Back Better Challenge Grants. The Senate committee recommended $3.897 billion for EERE, including $508 million for low-income household weatherization and intergovernmental assistance. The Consolidated Appropriations Act provided $3.200 billion for EERE, $1.532 billion below the request (-32%) but $338 million (12%) above the FY2021 amount. The FY2022 enacted measure included $427 million for weatherization and intergovernmental assistance but no appropriations for the Build Back Better grants.

[14] Senate Appropriations Committee, S.Rept. 117-36, p. 28.

[15] The Disaster Relief Supplemental Appropriations Act, 2022 (Division B of the Extending Government Funding and Delivering Emergency Assistance Act, 2021 [P.L. 117-43]), enacted on September 30, 2021, included drought funding for various Reclamation projects and programs. For more information on project-level allocations of this funding, see Bureau of Reclamation, "Distribution of Additional Funding in P.L. 117-43," at https://www.usbr.gov/budget/2022/FY-2022-Extending-Government-Funding-and-Delivering-Emergency-Assistance-Act-Funding-Allocation-Distribution-List.pdf.

The Infrastructure Investment and Jobs Act appropriated $16.264 billion in FY2022 through FY2026 in additional emergency spending for EERE programs, of which $8.207 billion was for FY2022.

Advanced Reactor Demonstrations

DOE proposed to boost funding for its Advanced Reactor Demonstration Program by 48% in FY2022, to $370 million. This included $245 million for two advanced nuclear reactor demonstration projects, with a cost-share of at least 50% from nonfederal sources. DOE announced awards totaling $160 million for two advanced reactor demonstrations on October 13, 2020—a sodium-cooled fast reactor and a high-temperature gas reactor.[16] Another $50 million was requested in FY2022 for grants to reduce the technical risk of five additional reactor technologies for possible future demonstration, with a nonfederal cost-share of at least 20%.

The budget request included a 222% funding increase, to $145 million, for preliminary design of the Versatile Test Reactor (VTR). The VTR would be a new reactor to provide fast (high energy) neutrons for testing advanced reactor fuels and materials. DOE estimated the project's total construction cost at between $3 billion and $6 billion, with completion ranging from 2026 to 2030.[17] Congress did not approve a large funding increase requested for the VTR in FY2021, instead instructing DOE to 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."[18]

DOE requested $33 million in FY2022 for a program authorized by the Energy Act of 2020 (Division Z of P.L. 116-260) to provide high-assay low-enriched uranium (HALEU) for advanced reactors. Many advanced reactor technologies would require fuel made with HALEU, which is uranium enriched to between 5% and 20% in the fissile isotope uranium-235. According to DOE, "This subprogram will work to make available small quantities of HALEU from limited DOE uranium inventories and leverage the HALEU enrichment demonstration capability in the short term, in coordination with the National Nuclear Security Administration (NNSA), and support the private sector in its building out of commercial HALEU production and supply chain capability in the U.S. for the long term."[19]

The House-passed bill included nearly the full request for the two advanced reactor demonstrations and an additional $25 million for the five possible future demonstrations. The bill included $33 million for HALEU availability. The Senate Appropriations Committee recommended the full request for the Advanced Reactor Demonstration Program and $47 million for HALEU availability. The Consolidated Appropriations Act provided $60 million for the two advanced reactor demonstrations, $184 million below the request, $115 million for the possible future demonstrations, $65 million above the request, and $72 million for HALEU availability,

[16] 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.

[17] 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.

[18] Consolidated Appropriations Act, 2021, Committee Print of the Committee on Appropriations, U.S. House of Representatives, on H.R. 133/P.L. 116-240, Book 1, March 2021, p. 907, https://www.govinfo.gov/content/pkg/CPRT-117HPRT43749/pdf/CPRT-117HPRT43749.pdf.

[19] DOE, *FY 2022 Congressional Budget Justification*, vol. 3, part 2, May 2021, p. 53, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-3.2-v3.pdf.

$39 million above the request. Neither of the House or Senate bills nor the enacted measure included funds for the VTR.

The Infrastructure Investment and Jobs Act appropriated $2.477 billion in FY2022 through FY2025 in additional, emergency funding for the Advanced Reactor Demonstration Program. The funding is provided under the new Office of Clean Energy Demonstration (see **Table 1**).

Proposed Realignment of the Office of Petroleum Reserves

The Administration proposed realigning the Office of Petroleum Reserves (OPR) to report to the Cybersecurity, Energy Security, and Emergency Response (CESER) Assistant Secretary. Currently, OPR is part of DOE's Office of Fossil Energy. The OPR includes the Strategic Petroleum Reserve (SPR) and its Northeast Gasoline Supply Reserve (NGSR) component, along with the Northeast Home Heating Oil Reserve (NEHHOR—see next section). Programs related to the sale of the Naval Petroleum and Oil Shale reserves are also within the OPR organization.

The House-passed bill supported the proposed realignment under CESER. The realignment was not addressed in the Senate committee bill or report, or in the Consolidated Appropriations Act or Explanatory Statement.

Proposed Termination of Funding for the Northeast Home Heating Oil Reserve and the Northeast Gasoline Supply Reserve

The Administration proposed to terminate funding for NEHHOR in FY2022. Established in 2000, the reserve holds 1 million barrels of heating oil at commercial storage facilities in New England to mitigate potential supply disruptions in the region. The Reserve was appropriated $6.5 million for FY2021. At a Senate Energy and Natural Resources Committee hearing on the DOE FY2022 budget request, Senator King of Maine noted that his state was the most reliant on heating oil in the nation and that potential supply disruptions were "of grave concern." Energy Secretary Granholm replied that funding for the heating oil reserve was proposed for elimination because it had never been used as intended. However, she said the unexpected shutdown of the Colonial Pipeline in May, causing fuel disruptions along much of the East Coast, had illustrated the potential need for the reserve. Granholm said the reserve had sufficient funding through mid-2022 and promised to work with King in keeping it operational after that.[20] Both the FY2022 House-passed bill and Senate committee bill included funding for the heating oil reserve at the FY2021 level, and the Consolidated Appropriations Act followed suit.

The Administration's FY2022 budget proposal also did not request funding for the Northeast Gasoline Supply Reserve. In recent years, carryover funding from previous appropriations has been used to pay for NGSR expenses. The FY2022 budget request did not indicate whether or not adequate carryover funds were available to pay for NGSR expenses during FY2022. The House Appropriations Committee report directed DOE to maintain the NGSR and authorized regional release and sale of refined product from the NGSR based on regional, rather than national, supply interruptions. The Consolidated Appropriations Act provided $22 million for NGSR out of the SPR account.

[20] Senate Committee on Energy and Natural Resources, *Full Committee Hearing to Examine the President's FY 2022 Budget Request for the Department of Energy*, June 15, 2022, https://www.energy.senate.gov/hearings/2021/6/full-committee-hearing-to-examine-the-president-s-fy-2022-budget-request-for-the-department-of-energy.

Title XVII Loan Guarantee Subsidy Funding

The Administration's FY2022 budget request included $150 million to pay for credit subsidy costs for qualifying projects. Subsidy cost payments, which reflect the budgetary effects of federal credit programs, are required up-front by the Federal Credit Reform Act of 1990 (FCRA; Section 13201 of P.L. 101-58). For Title XVII loan guarantees, subsidy costs can be paid through appropriations, by the borrower, or a combination thereof. The Office of Management and Budget provides guidance for calculating subsidy costs, which are unique to each qualifying project.[21] From an overall project portfolio perspective, Title XVII subsidy costs range from 10% to 15% of loan guarantee commitments.

Title XVII of the Energy Policy Act of 2005 (P.L. 109-58, as amended at 42 U.S.C. §16511 et seq.) authorizes DOE to guarantee loans for projects that meet the following criteria:

- avoid, reduce, utilize, or sequester air pollutants or greenhouse gas emissions; and
- employ new or significantly improved technologies, including projects that employ elements of commercial technologies in combination with new or significantly improved technologies.

To date, the original and ongoing Title XVII authority—referred to as Section 1703—has provided financial support for one project. Most Title XVII loan guarantee commitments were provided under a temporary authority—referred to as Section 1705—that expired in September 2011.[22]

Approximately $23.9 billion of loan guarantee authority is currently available for Section 1703 projects, not accounting for any conditional commitments. One factor that has resulted in low utilization of Section 1703 authority is the requirement for most borrowers to pay for all or a portion of a project's credit subsidy cost. Congress appropriated $170 million in 2011 for Section 1703 renewable energy and efficient energy projects. After a rescission and transfer, $161 million is still available and to date these funds have not been used to support Section 1703 loan guarantees.

The additional $150 million credit subsidy appropriation would have been used to support "innovative electric vehicle infrastructure, carbon management, and other clean energy projects," according to the Administration's request. DOE expected that the appropriation would have increased Title XVII loan guarantee authority by $1.5 billion, over and above the existing $23.9 billion authority limit.[23] Combined with Title XVII amendments in the Energy Act of 2020 (P.L. 116-260, Division Z), additional credit subsidy appropriations could have made the program more attractive to certain borrowers and increased utilization of Title XVII loan guarantee authority. Neither the House-passed bill, the Senate committee bill, nor the Consolidated Appropriations Act included the requested $150 million for credit subsidy costs and instead continued funding for DOE loan guarantee programs at their FY2021 levels. However, the enacted appropriations measure included a provision to allow DOE to issue direct loans in addition to loan guarantees

[21] See OMB Circular A-11, Part 5, Section 185, "Federal Credit," available at https://www.whitehouse.gov/wp-content/uploads/2018/06/s185.pdf.

[22] For additional information, see CRS Insight IN11432, *Department of Energy Loan Programs: Title XVII Innovative Technology Loan Guarantees*, by Phillip Brown et al.

[23] DOE, *FY 2022 Congressional Budget Justification*, vol. 3, part 2, May 2021, p. 308, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-3.2-v3.pdf.

under the Tribal Energy Loan Guarantee Program, using previous appropriations for the subsidy costs.

Proposal for Advanced Research Project Agency—Climate

The Administration proposed to establish ARPA-C as a new agency within DOE, modeled after the existing ARPA-E, to "accelerate transformational technological advances in areas that industry by itself will not support because of technical and financial risk and uncertainty." But while ARPA-E focuses on innovative energy technologies, ARPA-C would include climate change-related technologies "that encompass more than energy emissions," according to the DOE budget justification. Such research areas could include mitigation of nonenergy greenhouse gas emissions and enhancing climate change resiliency and adaptation. The Administration requested $200 million in FY2022 to fund as many as six initial climate technology research programs.[24]

Funding for the Administration's proposed ARPA-C was not included in the House-passed bill, the Senate Appropriations Committee bill, or in the Consolidated Appropriations Act. The House and Senate committee reports said ARPA-E could potentially fund some of the research areas proposed for ARPA-C. The Consolidated Appropriations Act provided $450 million for ARPA-E ($23 million above the FY2021 level), with the Explanatory Statement directing DOE "to consider activities proposed under ARPA-C that are consistent with ARPA-E's mission and authorization in addition to its other current and proposed activities."[25]

Establishment of Office of Clean Energy Demonstration

The Administration requested $400 million for a new Office of Clean Energy Demonstration (OCED) in FY2022. The new office was designed to "support a multi-year series of competitive solicitations in collaboration with the private sector to conduct demonstrations," starting in FY2022 with a solicitation for commercial-scale energy storage, according to the DOE budget justification.[26] A related proposal called for a separate appropriations account for DOE's Office of Technology Transitions, which facilitates the transfer of DOE-supported technologies toward private-sector commercialization. The program was to receive a 10% funding increase in FY2022, to $19 million, which was included in the House-passed bill, the Senate committee bill, and the Consolidated Appropriations Act. For the Office of Clean Energy Demonstration, the House bill would have provided $200 million and the Senate committee bill $100 million, while the enacted amount was $20 million.

However, before the FY2022 Consolidated Appropriations Act was passed, IIJA authorized the Office of Clean Energy Demonstration (§41201) and provided appropriations for several authorized programs (Division J, Title III). These appropriations were designated as emergency funding provided in addition to regular annual appropriations. For FY2022, the total for Clean Energy Demonstrations in IIJA is $5.127 billion, including 3% ($154 million) for program direction (see **Table 1**).

[24] Ibid., pp. 357-361.

[25] Explanatory Statement for Consolidated Appropriations Act, 2022, *Congressional Record*, p. H2254, March 9, 2022.

[26] DOE, *FY 2022 Congressional Budget Justification*, DOE/CF-0172, vol. 2, p. 319, May 2021, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-2-v3.pdf.

Table 1. Additional Appropriations for Clean Energy Demonstrations in Infrastructure Investment and Jobs Act (P.L. 117-58)

(budget authority in millions of current dollars)

Program	FY2022	FY2023	FY2024	FY2025	FY2026	Total
Energy Storage Demonstration Pilot Grants Program	88.8	88.8	88.8	88.8	—	355.0
Long-Duration Demonstration Initiative and Joint Program	37.5	37.5	37.5	37.5	—	150.0
Advanced Reactor Demonstration Program	677.0	600.0	600.0	600.0	—	2,477.0
Carbon Capture Large-scale Pilot Projects	387.0	200.0	200.0	150.0	—	937.0
Carbon Capture Demonstration Projects	937.0	500.0	500.0	600.0	—	2,537.0
Industrial Emission Demonstration Projects	100.0	100.0	150.0	150.0	—	500.0
Clean Energy Demonstration Program on Current and Former Mine Land	100.0	100.0	100.0	100.0	100.0	500.0
Regional Clean Hydrogen Hubs	1,600.0	1,600.0	1,600.0	1,600.0	1,600.0	8,000.0
Program Upgrading Our Electric Grid and Ensuring Reliability and Resiliency	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	5,000.0
Energy improvement in rural and remote areas	200.0	200.0	200.0	200.0	200.0	1,000.0
Total	**5,127.3**	**4,426.3**	**4,476.3**	**4,526.3**	**2,900.0**	**21,456.0**
3% set-aside for program administration	153.8	132.8	134.3	135.8	87.0	643.7

Source: P.L. 117-58, Division J, as passed by the Senate.

Notes: Appropriations would be in addition to other amounts made available for these purposes.

No Further Funds for Uranium Reserve

The FY2022 budget request for the DOE Office of Nuclear Energy did not include further funding for the DOE Uranium Reserve, following the FY2021 appropriation of $75 million to establish the Reserve. Additional Uranium Reserve funding also would not be provided by either the House-passed or Senate Appropriations Committee bills, nor by the Consolidated Appropriations Act.

This Trump Administration initiative called for DOE to purchase uranium from domestic uranium producers over 10 years and have it converted to uranium hexafluoride (a necessary step in making nuclear reactor fuel) by a domestic conversion facility. The initial $75 million for the Uranium Reserve was included within the NNSA Weapons Activities account, and DOE invited public comment on August 11, 2021, about "topics related to establishment of the DOE's Uranium Reserve program."[27] DOE did not request funding for the Uranium Reserve in its FY2022 budget request, and Congress did not provide any FY2022 appropriations for it.

[27] NNSA, "Request for Information Regarding Establishment of the Department of Energy Uranium Reserve Program," August 11, 2021, https://www.federalregister.gov/documents/2021/08/11/2021-17145/request-for-information-

According to DOE's FY2021 budget justification, 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. However, the justification noted that, for the newly stockpiled uranium, "no immediate national security need has been identified."[28] The FY2021 budget justification further explained that the proposed government purchases were also intended to address "near-term challenges to the production and conversion of domestic uranium," which were under economic stress as well.[29]

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

Nuclear Waste Storage Pilot Program

The FY2022 Energy and Water Development bill approved by the Senate Appropriations Committee included language to establish a DOE pilot program for interim storage of spent nuclear fuel and high-level radioactive waste (Section 308). Priority was to be given to spent fuel currently stored at closed nuclear plant sites. Any proposed storage facility would require agreement by the governor of the host state, as well as by units of local government and affected Indian tribes. Funding for the pilot program would have been authorized from the Nuclear Waste Fund, subject to appropriation. Similar language has been included in previous years' Energy and Water funding bills by the Senate Appropriations Committee but not enacted. Neither the FY2022 House-passed bill nor the Consolidated Appropriations Act included the provision.

Both the House-passed and Senate committee bills included $20 million for nuclear waste interim storage planning and $7.5 million from the Nuclear Waste Fund for oversight activities related to the fund, and the same amounts were provided by the FY2022 Consolidated Appropriations Act. The House bill also included an unspecified amount of funding within the Nuclear Energy account for spent fuel transportation preparations, as part of an integrated waste management system, and the Explanatory Statement for the Consolidated Appropriations Act included similar direction.

Overall Level Funding for Weapons Activities

The FY2022 budget request for DOE Weapons Activities was less than 1% higher than the FY2021 enacted level ($15.484 billion vs. $15.345 billion). The FY2021 enacted appropriation for Weapons Activities was 23% above the FY2020 level. Weapons Activities programs are carried out by the National Nuclear Security Administration (NNSA), a semiautonomous agency within DOE. The FY2022 bills passed by the House and approved by the Senate committee both included the requested amount for Weapons Activities, while the enacted amount was $15.920 billion, an increase of $575 million (4%) over the FY2021 level.

Under Weapons Activities, the FY2022 budget request included funding for several major nuclear warhead life-extension programs (LEPs):

- NNSA requested $772 million for the B61-12 LEP in FY2022, a decrease of $44 million (-5%) from the $816 million enacted for FY2021. The B61-12 LEP is to

regarding-establishment-of-the-department-of-energy-uranium-reserve-program.

[28] 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.

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

combine four existing variants of the B61 gravity bomb. The first production unit (FPU) had been 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 sought $207 million for the W88 Alteration in FY2022, a reduction of $50 million (-19%) from the $257 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 full production in FY2022.
- NNSA requested $1.08 billion for the W80-4 in FY2022, an increase of $80 million (8%) over the $1.0 billion enacted in FY2021. This is the warhead for a 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 FY2022 reflected an increase in the scope of work on the program. The FPU is scheduled for FY2025.
- NNSA requested $691 million for the W87-1 warhead modification program for FY2022, an increase of $150 million (28%) over the $541 million enacted for FY2021. 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 noted 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.
- NNSA requested $98 million to begin a program to extend the service life of the B83 bomb for the B-2 bomber.[30]

Both the House and the Senate Appropriations Committees questioned funding for the W80-4 alteration for the new sea-launched cruise missile and the LEP for the B83 bomb in their reports on the FY2022 appropriations bills. The House committee (H.Rept. 117-98) eliminated funding for both programs, contending that funding was premature because the Biden Administration had not yet completed its planned Nuclear Posture Review (NPR). The Senate committee, in its report (S.Rept. 117-36), mandated that NNSA certify that there were operational requirements justifying these programs before it obligated funding. The Consolidated Appropriations Act provided the requested funding, with the Explanatory Statement saying, "NNSA is directed to brief the Congressional Defense Committees on any departures from the fiscal year 2022 budget request in the NPR."

For more information, see CRS Report R44442, *Energy and Water Development Appropriations: Nuclear Weapons Activities*, by Amy F. Woolf.

[30] DOE, *FY 2022 Congressional Budget Justification*, vol. 1, pp. 80, 83, May 2021, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-volume-1-v4.pdf.

Integrated Planning for Plutonium Pit Production

Congress had raised concerns in FY2021 about NNSA's production plans for plutonium pits (cores) for nuclear warheads and mandated that NNSA provide 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."

In their reports on the FY2022 appropriations bills, both the House and the Senate Appropriations Committees again stressed their concerns about the pit production programs. Both noted that NNSA had not yet submitted the required plans and reports. The House committee (H.Rept. 117-98) also repeated its concerns about contingency planning at NNSA for pit production, noting "the timeline for achieving 80 pits per year will stretch beyond 2030." The Senate committee, in its report (S.Rept. 117-36), noted that it "continues to support the program of record" for pit production, but suggested that it would be unable to continue this support without the information in the required plans. The Consolidated Appropriations Act Explanatory Statement directed NNSA to give the House and Senate Appropriations Committees "an update detailing actionable plans based on current pit production timelines and coordinated with the Department of Defense."

For more information, see CRS Report R44442, *Energy and Water Development Appropriations: Nuclear Weapons Activities*, by Amy F. Woolf.

Cleanup of Former Nuclear Sites: Adequacy of Proposed Funding and Transfers

DOE's Office of Environmental Management (EM) is responsible for environmental cleanup and waste management at the department's nuclear facilities. The $7.596 billion request for EM activities for FY2022 was $10 million (about a tenth of 1%) above the FY2021 enacted level. The House-passed bill included $7.757 billion for EM, while the Senate Appropriations Committee recommended $7.709 billion (both about 2% above FY2021). The FY2022 Consolidated Appropriations Act provided $7.904 billion for EM, an increase of $318 million (4%) over the FY2021 enacted level.

The budgetary components of the EM program are Defense Environmental Cleanup and Non-Defense Environmental Cleanup, both proposed by the Administration for a 6% increase over their FY2021 enacted levels, and the Uranium Enrichment Decontamination and Decommissioning Fund. The Administration proposed an offset of $416 million for the defense contribution to the Uranium Enrichment Decontamination and Decommissioning Fund as a transfer from the Defense Environmental Cleanup account. The Consolidated Appropriations Act appropriated $573 million for the defense contribution in a separate Defense Uranium Enrichment Decontamination and Decommissioning account, a $158 million increase above the request that the Administration proposed for the same purpose.

The Administration's proposed reduction of $104 million (-6%) for cleanup of the Hanford (WA) nuclear site drew criticism from Senator Cantwell at a Senate Energy and Natural Resources Committee hearing on DOE's FY2022 budget request. She told Energy Secretary Jennifer Granholm that the DOE budget request for Hanford cleanup was at least $900 million below the amount needed for DOE to keep its commitments to state and federal environmental regulators.

Granholm responded that DOE was negotiating within the Administration for additional funding.[31]

The FY2022 request included a proposal to transfer management of the Formerly Utilized Sites Remedial Action Program (FUSRAP) 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 and FY2021; it was not approved by Congress. The FY2022 LM budget request included $250 million for FUSRAP, the same as appropriated to USACE for the program in FY2020. According to the DOE budget justification, "There would be no change to the execution of the work: 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."[32]

Neither the House-passed bill nor the Senate Appropriations Committee bill included the proposed FUSRAP transfer, nor did the FY2022 Consolidated Appropriations Act, which provided $300 million for the program.

Bill Status and Recent Funding History

Table 2 indicates the steps taken during consideration of FY2022 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, FY2022

Subcommittee Markup							Final Approval		
House	Senate	House Comm.	House Passed	Senate Comm.	Senate Passed	Conf. Report	House	Senate	Public Law
7/12/21	None	7/16/21	7/29/21	8/4/21			3/9/22	3/10/22	3/15/22

Source: CRS Appropriations Status Table.

Note: The House Energy and Water Development appropriations bill was combined with six others for initial House passage. There was no initial Senate passage or conference report. Energy and Water Development appropriations constitute Division D of the Consolidated Appropriations Act, 2022 (P.L. 117-103).

Table 3 includes budget totals for energy and water development appropriations enacted for FY2015 through FY2021 and major stages of consideration for FY2022.

[31] Senate Committee on Energy and Natural Resources, *Full Committee Hearing to Examine the President's FY 2022 Budget Request for the Department of Energy*, June 15, 2022, https://www.energy.senate.gov/hearings/2021/6/full-committee-hearing-to-examine-the-president-s-fy-2022-budget-request-for-the-department-of-energy.

[32] DOE, *FY 2022 Congressional Budget Request, Budget in Brief*, p. 95, May 2021, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-in-brief-v4.pdf.

Table 3. Energy and Water Development Appropriations, FY2017-FY2022

(budget authority in billions of current dollars)

FY2017	FY2018	FY2019	FY2020	FY2021	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Enacted
37.4[a]	43.2[b]	44.7[c]	48.3[d]	49.5	55.5[e]	56.2[e]	56.4[e]	55.6[f]

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. Does not include budget scorekeeping adjustments.

f. Does not include appropriations from IIJA (P.L. 117-58), supplemental appropriations from P.L. 117-43, or budget scorekeeping adjustments.

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	FY2019 Approp.	FY2020 Approp.	FY2021 Approp.	FY2022 Request	F2022 House	FY2022 S. Com.	FY2022 Approp.
Title I: Corps of Engineers	6,999	7,650	7,795	6,793	8,660	8,960	8,343
Title II: CUP and Reclamation	1,565	1,680	1,691	1,553	1,966	2,007	1,924
Title III: Department of Energy	35,709	38,657	39,625	46,646	45,458	45,324	44,856
Title IV: Independent Agencies	390	407	414	481	460	461	454
General provisions	21	—	—	—	—	—	—
Subtotal	44,684	48,395	49,525	55,473	56,208	56,752[a]	55,576
Rescissions and Scorekeeping Adjustments[b]	-24	-71	-73	-1,848	-2,982	-3,127	-2,704
E&W Total	**44,660**	**48,324**	**49,452**	**53,625**	**53,226**	**53,625**	**52,872**

Sources: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.Rept. 117-98; H.R. 4502; FY2022 agency budget justifications; 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. Excludes emergency appropriations. Subtotals may include other adjustments. Columns may not sum to totals because of rounding and adjustments.

a. Senate subtotal including rescission of $336 million but excluding emergency spending and other adjustments is $56.416 billion.

b. 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

FY2022 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/fy2022-cupca-budget-justification.pdf
- Title III, Department of Energy, https://www.energy.gov/cfo/articles/fy-2022-budget-justification
- Title IV, Independent Agencies

- Appalachian Regional Commission, https://www.arc.gov/budget-performance-and-policy
- 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.[33]

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]); 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]); and in December 2020, the Water Resources Development Act of 2020 (Division AA of P.L. 116-260, Consolidated Appropriations Act, 2021). These acts consisted largely of authorizations for new USACE projects, and they altered numerous USACE policies and procedures.[34]

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.

Policies in the 112th through the 116th Congresses 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. During that period, after congressional enactment of the appropriations legislation and accompanying report language on priorities and other guidance for use of the additional funding, the Administration developed a work plan that reported 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.

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

[34] 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.

For FY2022, in addition to providing funds for the President's requested studies and projects, Congress in the Explanatory Statement for the Consolidated Appropriations Act (1) funded geographically specific studies and projects that were requested by Members of Congress (i.e., community project funding/congressionally directed spending, CPF/CDS), and (2) provided funds in broad categories (referred to as additional funding) and directed USACE to develop a work plan for distributing funds to individual studies and projects (as had been the case in the 112th to the 116th Congresses). Congress did not provide the Administration with authority to initiate additional starts with FY2022 work plan appropriations beyond those provided for in the Explanatory Statement. For more information, see CRS In Focus IF11846, *Army Corps of Engineers: FY2022 Appropriations*, by Anna E. Normand and Nicole T. Carter; 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 FY2019-FY2022.

Table 5. Army Corps of Engineers

(budget authority in millions of current dollars)

Program	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 Approp.	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp
Investigations and Planning	125.0	151.0	102.6	153.0	105.8	159.0	153.0	143.0
Construction	2,183.0	2,681.0	2,173.2[a]	2,692.6	1,792.4	2,591.7	3,002.0	2,492.8
Mississippi River and Tributaries (MR&T)	368.0	375.0	209.9[a]	380.0	269.7	370.0	380.0	370.0
Operation and Maintenance (O&M)	3,739.5	3,790.0	1,996.5[a]	3,849.7	2,502.9	4,817.0	4,682.8	4,570.0
Regulatory	200.0	210.0	200.0	210.0	204.4	212.0	212.0	212.0
General Expenses	193.0	203.0	187.0	206.0	199.3	206.0	216.0	208.0
FUSRAP[b]	150.0	200.0	0	250.0	0	250.0	260.0	300.0
Flood Control and Coastal Emergencies (FCCE)	35.0	35.0	77.0	35.0	35.0	35.0	35.0	35.0
Office of the Asst. Secretary of the Army	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
WIFIA Program[c]				14.2	0	14.2	14.2	7.2
Harbor Maintenance Trust Fund			1,015.0		1,625.9			

Program	FY2019 Approp.	FY2020 Approp.	FY2021 Request	FY2021 Approp.	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp
Inland Waterways Trust Fund			0		52.2			
Rescissions				-0.5				
Total Title I	**6,998.5**	**7,650.0**	**5,966.2**	**7,795.0**	**6,792.5**	**8,659.9**	**8,960.0**	**8,343.0**

Sources: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.Rept. 117-98; H.R. 4502; USACE Civil Works FY2022 Budget; 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 have replaced 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 have been funded by the O&M account and reimbursed by the HMTF; instead the dredging would have been funded directly from the HMTF account. The proposal was not included in the enacted measure, and similar proposals also were not enacted in FY2019, FY2020, and FY2021.

b. Formerly Utilized Sites Remedial Action Program. The Administration's FY2020, FY2021, and FY2022 requests proposed transferring administration and funding of FUSRAP to the DOE Office of Legacy Management. The proposal was not enacted.

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 (WIFIA, Title V, Subtitle C of P.L. 113-121). The FY2022 budget request did not request funding for this account.

In addition to the regular annual appropriations provided by the Consolidated Appropriations Act, 2022, USACE received supplemental appropriations for FY2022 from the Disaster Relief Supplemental Appropriations Act, 2022 (Division B of the Extending Government Funding and Delivering Emergency Assistance Act, 2021, P.L. 117-43), and IIJA (P.L. 117-58), as shown in **Table 6**.

Table 6. Additional FY2022 Appropriations for USACE

Disaster Relief Supplemental Appropriations Act, 2022 (P.L. 117-43, Division B) and Infrastructure Investment and Jobs Act (P.L. 117-58), budget authority in millions of current dollars

Program	P.L. 117-43	P.L. 117-58
Investigations	100.0	120.0
Construction	3,000.0	11,515.0
Mississippi River and Tributaries	868.0	808.0
Operation and Maintenance	887.0	2,000.0
Regulatory Program		160.0
Flood Control and Coastal Emergencies	826.0	251.0
Expenses	30.0	40.0

Program	P.L. 117-43	P.L. 117-58
Water Infrastructure Finance and Innovation Program Account		75.0
Totals	**5,711.0**	**14,969.0**

Source: Explanatory Statement for H.R. 2471.

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. For FY2022, the rules again allowed congressionally directed funding for 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.[35] 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.[36]

For more information, see CRS In Focus IF11855, *Bureau of Reclamation: FY2022 Appropriations*, by Charles V. Stern. Previous appropriations and the amounts recommended and approved during the major stages of the FY2022 appropriations process are shown in **Table 7**.

[35] 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.

[36] 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/.

Table 7. Bureau of Reclamation and CUP

(budget authority in millions of current dollars)

Program	FY2019 Approp	FY2020 Approp	FY2021 Approp	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp.
Water and Related Resources	1,392.0	1,512.2	1,521.1	1,379.1	1,793.5	1,832.1	1,747.1
Policy and Administration	61.0	60.0	60.0	64.4	62.9	64.4	64.4
CVP Restoration Fund (CVPRF)	62.0	54.8	55.9	56.5	56.5	56.5	56.5
Calif. Bay-Delta (CALFED)	35.0	33.0	33.0	33.0	33.0	33.0	33.0
Gross Current Reclamation Authority	**1,550.0**	**1,660.0**	**1,670.0**	**1,532.9**	**1,945.9**	**1,986.0**	**1,901.0**
Central Utah Project (CUP) Completion	15.0	20.0	21.0	20.0	20.0	21.0	23.0
Total, Reclamation and CUP	**1,565.0**	**1,680.0**	**1,691.0**	**1,552.9**	**1,965.9**	**2,007.0**	**1,924.0**

Sources: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.Rept. 117-98; H.R. 4502; Reclamation and CUP FY2022 congressional budget justifications, 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.

In addition to the regular annual appropriations provided by the Consolidated Appropriations Act, 2022, Reclamation's Water and Related Resources account received FY2022 appropriations of $210 million from the Disaster Relief Supplemental Appropriations Act, 2022 (P.L. 117-43) and $1.660 billion from IIJA. CUP received additional FY2022 appropriations of $10 million from P.L. 117-43 and $50 million from IIJA.

Department of Energy

The Energy and Water Development appropriations bill has funded all DOE programs since FY2005. Major DOE activities are authorized under multiple energy statutes and 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 8** provides the recent funding history for DOE programs, which are briefly described further below.

Table 8. Department of Energy

(budget authority in millions of current dollars)

	FY2019 Approp.	FY2020 Approp.	FY2021 Approp.	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp.
ENERGY PROGRAMS							
Energy Efficiency and Renewable Energy	2,379.0	2,790.0	2,861.8	4,732.0	3,776.0	3,897.0	3,200.0
Electricity Delivery[a]	156.0	190.0	211.7	327.0	267.0	303.0	277.0
Cybersecurity, Energy Security, and Emergency Response[a]	120.0	156.0	156.0	201.0	177.0	177.0	185.8
Nuclear Energy[b]	1,326.1	1,493.4	1,507.6	1,850.5	1,675.0	1,590.8	1,654.8
Fossil Energy and Carbon Management	740.0	750.0	750.0	890.0	816.0	850.0	825.0
Naval Petroleum and Oil Shale Reserves	10.0	14.0	13.0	13.7	13.7	13.7	13.7
Strategic Petroleum Reserve[c]	245.0	205.0	189.0	204.4	204.4	96.4	226.4
Northeast Home Heating Oil Reserve	10.0	10.0	6.5	0	6.5	6.5	6.5
Energy Information Administration	125.0	126.8	126.8	126.8	129.1	129.1	129.1
Non-Defense Environmental Cleanup	310.0	319.2	319.2	338.9	333.9	338.9	333.9
Uranium Enrichment Decontamination and Decommissioning Fund	841.1	881.0	841.0	831.3	831.3	860.0	860.0
Science	6,585.0	7,000.0	7,026.0	7,440.0	7,320.0	7,490.0	7,475.0
Office of Technology Transitions				19.5	19.5	19.5	19.5
Office of Clean Energy Demonstration				400.0	200.0	100.0	20.0
Advanced Research Projects Agency—Energy (ARPA-E)	366.0	425.0	427.0	500.0	600.0	500.0	450.0
Advanced Research Projects Agency—Climate (ARPA-C)				200.0	0	0	0
Nuclear Waste Disposal			27.5	7.5	27.5	27.5	27.5
Departmental Admin. (net)	165.9	161.0	166.0	321.8	263.0	243.0	240.0
Office of Inspector General	51.3	54.2	57.7	78.0	78.0	78.0	78.0
Office of Indian Energy	18.0	22.0	22.0	122.0	70.0	122.0	58.0

	FY2019 Approp.	FY2020 Approp.	FY2021 Approp.	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp.
Advanced Technology Vehicles Manufacturing (ATVM) Loans	5.0	5.0	5.0	5.0	5.0	5.0	5.0
ATVM Rescission of Emergency Funding			-1,903.0				
Title 17 Loan Guarantee	18.0	29.0	29.0	179.0	29.0	29.0	29.0
Title 17 Rescission of Emergency Funding			-363.0				
Tribal Indian Energy Loan Guarantee	1.0	2.0	2.0	2.0	2.0	2.0	2.0
TOTAL, ENERGY PROGRAMS	**13,472.4**	**14,633.6**	**12,444.8**	**18,790.2**	**16,843.8**	**16,878.2**	**16,116.0**
Weapons Activities	11,100.0	12,457.1	15,345.0	15,484.3	15,484.3	15,484.3	15,920.0
Nuclear Nonproliferation	1,930.0	2,164.4	2,260.0	1,934.0	2,340.0	2,264.0	2,354.0
Naval Reactors	1,788.6	1,648.4	1,684.0	1,860.7	1,866.7	1,840.5	1,918.0
Office of Admin./Salaries and Expenses	410.0	434.7	443.2	464.0	464.0	453.0	464.0
Total, NNSA	**15,228.6**	**16,704.6**	**19,732.2**	**19,743.0**	**20,155.0**	**20,041.8**	**20,656.0**
Defense Environmental Cleanup	6,024.0	6,255.0	6,426.0	6,841.7	6,592.0	6,510.0	6,710.0
Defense Uranium Enrichment D&D					831.4	860.0	573.3
Other Defense Activities	860.3	906.0	920.0	1,170.0	932.0	930.4	985.0
TOTAL, DEFENSE ACTIVITIES	**22,112.9**	**23,865.6**	**27,078.2**	**27,754.7**	**28,510.3**	**28,342.2**	**28,924.3**
Southwestern	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Western	89.4	89.2	89.4	90.8	90.8	90.8	90.8
Falcon and Amistad O&M	0.2	0.2	0.2	0.2	0.2	0.2	0.2
TOTAL, PMAs	**100.0**	**99.8**	**100.0**	**101.4**	**101.4**	**101.4**	**101.4**
General provisions		-12.7	-2.0		-334.0	-334.0	-286.1
DOE total appropriations	**35,708.9**	**38,657.2**	**39,625.0**	**46,646.3**	**45,447.5**	**45,323.8**	**44,855.6**
Offsets and adjustments	-23.6	-70.9			-336.0	-336.0	
Total, DOE	**35,685.3**	**38,586.3**	**39,625.0**	**46,646.3**	**45,121.5**	**44,987.8**	**44,855.6**

Sources: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.Rept. 117-98; H.R. 4502; DOE FY2022 congressional budget justification, 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 Electricity Delivery and the Office of Cybersecurity, Energy Security, and Emergency Response were created from the former Office of Electric Delivery and Energy Reliability in FY2019.

b. Includes appropriations under defense budget function.

c. Includes SPR Petroleum Account.

In addition to the regular annual appropriations provided by the Consolidated Appropriations Act, 2022, DOE received additional FY2022 appropriations from IIJA as shown in **Table 9**. DOE also received FY2022 supplemental appropriations of $43 million for the SPR from P.L. 117-43.

Table 9. Additional FY2022 DOE Funding Under IIJA

(budget authority in millions of current dollars)

Program	IIJA Approp.
Energy Efficiency and Renewable Energy	8,207.2
Cybersecurity, Energy Security, and Emergency Response	150.0
Electricity	1,660.0
Nuclear Energy	1,200.0
Fossil Energy and Carbon Management	1,839.0
Carbon Dioxide Transportation Infrastructure Finance and Innovation Program Account	3.0
Office of Clean Energy Demonstration	5,127.3
Western Area Power Administration	500.0
Total	**18,686.5**

Source: Explanatory Statement for H.R. 2471.

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, hydrogen and fuel cells, and alternative fuels. DOE's electric vehicle program includes several goals for 2030, including "decreasing vehicle battery cell cost to achieve cost parity with internal combustion engines" and "eliminating dependence on critical materials such as cobalt, nickel, and graphite." The program also supports demonstrations of electrified medium and heavy trucks, according to the FY2022 DOE budget justification.[37]

Renewable power programs focus on electricity generation from solar, wind, water, and geothermal sources. They are also developing concentrated solar technologies to produce high-temperature heat that could replace fossil fuels in steel manufacturing and other industrial processes. In the energy efficiency program area, the advanced manufacturing program focuses on improving the energy efficiency of manufacturing processes and on the manufacturing of

[37] DOE, *FY2022 Budget in Brief*, May 2021, p. 31, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-in-brief-v4.pdf.

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.[38]

For more details on energy efficiency grants, see CRS Report R46418, *The Weatherization Assistance Program Formula*, by Corrie E. Clark and Lynn J. Cunningham.

Electricity Delivery, Cybersecurity, Energy Security, and Energy Reliability

The Office of Cybersecurity, Energy Security, and Emergency Response (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.[39]

The Office of Electricity (OE) leads DOE efforts "to strengthen, transform, and improve energy infrastructure so that consumers have access to secure and resilient sources of energy." OE uses a model of North American energy vulnerabilities for analyzing transmission and other energy infrastructure needs. Other activities include pursuing megawatt-scale electricity storage, integrating electric power system sensing technology, and analyzing electricity-related policy issues.[40] The office also includes the DOE power marketing administrations, which are funded from separate appropriations accounts.

Nuclear Energy

DOE's Office of Nuclear Energy (NE) supports R&D on technologies to improve the efficiency and economic viability of existing U.S. nuclear power plants, development and demonstration of advanced reactor technologies, and R&D on nuclear fuel cycle technologies. The FY2022 DOE budget justification calls NE "a key element of the Administration's plan to put the United States (U.S.) on a path to net-zero emissions by 2050."[41]

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. To help develop those technologies, NE has proposed 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").

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

[38] Ibid., p. 32.

[39] Ibid., p. 47.

[40] Ibid., p. 37.

[41] Ibid., p. 57.

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. HALEU would be required for several designs currently receiving cost-shared support by DOE's Advanced Reactor Demonstration Program. For more information, see CRS Report R45706, *Advanced Nuclear Reactors: Technology Overview and Current Issues*, by Danielle A. Arostegui and Mark Holt.

Fossil Energy and Carbon Management

The Fossil Energy and Carbon Management Research, Development, Demonstration, and Deployment program (FECM)—formerly known as the Fossil Energy Research and Development program—supports research related to coal, natural gas, and petroleum.[42] The program also supports operations at the National Energy Technology Laboratory. Major focus areas in recent years include development of carbon capture technologies; characterization of geologic formations capable of permanently storing carbon dioxide; development of new uses for carbon dioxide and coal; and developing new power plant technologies to more efficiently use fossil fuels to generate electricity. The FY2022 budget request for FECM "re-focuses from traditional fossil combustion-centric activities" to "climate-centric activities," such as carbon capture, utilization, and storage (CCUS), reducing methane leaks from fossil fuels systems, hydrogen produced from fossil fuels, and carbon removal.[43] Some of these activities are continuing from previous years and others were authorized by the Energy Act of 2020 (P.L. 116-260, Division Z).

The House and Senate Appropriations Committee reports supported R&D activities related to carbon capture, carbon removal, hydrogen, and other technologies aimed at reducing greenhouse gas emissions associated with fossil fuel use. The committee reports identified many of these activities as crosscutting initiatives, and directed FECM to coordinate with EERE, the Office of Science, and other specified programs.

The Consolidated Appropriations Act likewise generally supports the Administration's proposals. It provides a year-over-year smaller increase for CCUS and Power Systems line items than requested—an increase of $22.2 million rather than $84.7 million. However, IIJA provided $8.5 billion in supplemental appropriations to DOE's CCUS programs for FY2022-FY2026 plus $3.6 billion for direct air capture, a related technology. Combined, DOE's funding for CCUS and related activities for FY2022 is roughly 10 times higher than for FY2021.

The Explanatory Statement for the Consolidated Appropriations Act also establishes a new budget line item in tables in the joint explanatory statement: Resource Technologies and Sustainability. This area appears to encompass budget items called "Natural Gas Technologies" and "Unconventional Fossil Energy Technologies from Petroleum—Oil Technologies" in FY2021 and earlier appropriations acts.

For more information, see CRS In Focus IF11861, *DOE's Carbon Capture and Storage (CCS) and Carbon Removal Programs*, by Ashley J. Lawson.

[42] The Biden Administration renamed the Office of Fossil Energy as the Office of Fossil Energy and Carbon Management in 2021. This name change was also adopted by appropriators throughout the FY2022 appropriations process. See DOE, "Our New Name Is Also a New Vision," July 8, 2021, https://www.energy.gov/fe/articles/our-new-name-also-new-vision.

[43] DOE, *FY2022 Budget in Brief*, May 2021, p. 51, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-in-brief-v4.pdf.

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 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 and are currently being drawn down in response to high oil prices.[44] 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.[45] The Northeast Gasoline Supply Reserve—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.[46]

Science

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 FY2022 budget justification, the Office of Science "is the nation's largest Federal supporter of basic research in the physical sciences."[47]

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.

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[44] The White House, "President Biden Announces Release from the Strategic Petroleum Reserve as Part of Ongoing Efforts to Lower Prices and Address Lack of Supply Around the World," November 23, 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/23/president-biden-announces-release-from-the-strategic-petroleum-reserve-as-part-of-ongoing-efforts-to-lower-prices-and-address-lack-of-supply-around-the-world.

[45] 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.

[46] 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.

[47] DOE, *FY2022 Budget in Brief*, May 2021, p. 21, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-in-brief-v4.pdf.

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 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.

For more details, see CRS Report R46869, *Federal Research and Development (R&D) Funding: FY2022*, coordinated by John F. Sargent Jr.

Advanced Research Projects Agency–Energy

ARPA-E is a separate DOE office 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. According to DOE, since 2009 ARPA-E has provided $2.79 billion in R&D funding to 1,190 projects, and 181 projects have raised more than $5.4 billion in private sector follow-on funding.[48]

Loan Guarantees and Direct Loans

DOE's Loan Programs Office provides loan guarantees for projects that deploy innovative energy technologies, as authorized by Title XVII 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

[48] ARPA-E, "Our Impact," web page viewed August 27, 2021, https://arpa-e.energy.gov/about/our-impact.

technologies that reduce greenhouse gas emissions, and Section 1705 authorized a temporary program through FY2011 for renewable energy and energy efficiency projects.

Title XVII allows DOE to provide loan guarantees for up to 80% of construction costs for eligible energy projects. In general, 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:[49]

- Advanced Fossil Energy Projects Loan Guarantees, $8.5 billion;
- Advanced Nuclear Energy Projects Loan Guarantees, $10.9 billion;
- 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 and direct loan authority.

To date, the only loan guarantees under Section 1703 have been to the consortium building two new nuclear reactors at the Vogtle plant in Georgia, totaling about $12 billion.[50] Another nuclear loan guarantee is being sought by NuScale Power to build a small modular reactor in Idaho.[51]

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." IIJA directed EIA to make additional changes to its energy data collection, especially for electricity, building energy consumption, and international energy production and use. For more details, see CRS Report R46524, *The U.S. Energy Information Administration*, coordinated by Ashley J. Lawson.

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

[50] 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.

[51] 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.

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 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 funding 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 "strengthen the nonproliferation and arms control regimes through innovative policy development and implementation to prevent proliferation, ensure peaceful nuclear uses, and enable verifiable nuclear reductions," according to the FY2022 DOE justification.[52] This program conducts reviews of nuclear export applications and technology transfer authorizations, implements treaty obligations, and analyzes nonproliferation policies and proposals.

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[53] 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

[52] DOE, *FY2022 Budget in Brief*, May 2021, p. vol. 1, p. 73, https://www.energy.gov/sites/default/files/2021-06/doe-fy2022-budget-in-brief-v4.pdf.

[53] 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.

of Environmental Management (EM) primarily to consolidate its responsibilities for the cleanup of former nuclear weapons production sites that had been administered under multiple offices.[54]

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.[55] Responsibility for long-term stewardship at sites where remediation is complete or remedies are in place is transferred from EM to the separate DOE Office of Legacy Management and other offices within DOE.[56] 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 LM, which has its own DOE funding subaccount within Other Defense Activities.

EM is funded by three appropriations accounts. 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.[57] Those facilities are located near Paducah, KY; Piketon, OH (Portsmouth plant); and Oak Ridge, TN. DOE declared the demolition of buildings at the Oak Ridge enrichment site complete on October 13, 2020.[58] However, the Senate Appropriations Committee report noted that some cleanup activities are expected to continue until 2027.[59] 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.[60]

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.

Power Marketing Administrations

DOE's four Power Marketing Administrations were established to sell the power generated by various federal dams. 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

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

[55] 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.

[56] 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.

[57] 42 U.S.C. §2297g.

[58] 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.

[59] Senate Appropriations Committee, S.Rept. 117-36, p. 109.

[60] 42 U.S.C. §2296a.

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 85% 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 10**. Additional FY2022 appropriations totaling $581.3 million were provided by IIJA for ARC and other regional commissions and authorities as shown in **Table 11**.

Table 10. Independent Agencies Funded by Energy and Water Development Appropriations

(budget authority in millions of current dollars)

Program	FY2020 Approp.	FY2021 Approp.	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp.
Appalachian Regional Commission	175.0	180.0	235.0	210.0	210.0	195.0
Nuclear Regulatory Commission	*855.6*	*844.4*	*887.7*	*887.7*	*887.7*	*887.7*
(Revenues)	*-728.1*	*-721.4*	*-756.7*	*-756.7*	*-756.7*	*-756.7*
Net NRC (including Inspector General)	127.5	123.0	131.0	131.0	131.0	131.0
Defense Nuclear Facilities Safety Board	31.0	31.0	31.0	31.0	31.0	36.0
Nuclear Waste Technical Review Board	3.6	3.6	3.8	3.8	3.8	3.8
Denali Commission	15.0	15.0	15.1	15.0	15.1	15.1
Delta Regional Authority	30.0	30.0	30.1	30.0	30.1	30.1
Northern Border Regional Commission	25.0	30.0	30.1	34.0	35.0	35.0
Southeast Crescent Regional Commission	0.3	1.0	2.5	2.5	2.5	5.0
Southwest Border Regional Commission		0.3	2.5	2.5	2.5	2.5
Total	**407.3**	**413.9**	**481.1**	**459.8**	**461.0**	**453.5**

Sources: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.Rept. 117-98; H.R. 4502; FY2022 agency budget justifications; 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.

Table 11. Additional Appropriations in IIJA for Regional Commissions and Authorities

(budget authority in millions of current dollars)

Regional Commission or Authority	IIJA FY2022 Approp.
Appalachian Regional Commission	200.0
Delta Regional Authority (DRA)	150.0
Denali Commission	75.0
Northern Border Regional Commission (NBRC)	150.0
Southeast Crescent Regional Commission (SCRC)	5.0
Southwest Border Regional Commission (SBRC)	1.3
Total	**581.3**

Source: Explanatory Statement for H.R. 2471.

Notes: Funding for the federal regional commissions and authorities in the IIJA has varying periods of availability. Appropriations for ARC are available through FY2026, with $200 million to be allocated each fiscal year starting in FY2022 through FY2026. Appropriations for the DRA, Denali Commission, NBRC, SCRC, and SBRC are available until expended.

Appalachian Regional Commission

Established in 1965,[61] 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, 91.1% of ADHS is "under construction or open to traffic."[62]

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. In FY2022, Congress directed ARC to allocate $65 million to the POWER Initiative. 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

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

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

Julie M. Lawhorn; and CRS In Focus IF11140, *Federal Regional Commissions and Authorities: Overview of Structure and Activities*, by Julie M. Lawhorn.

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 12**. Nuclear Reactor Safety is NRC's largest program and is responsible for licensing and regulating the U.S. fleet of 93 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 FY2022).

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 nonsite-specific homeland security. As a result, NRC's net appropriation for FY2022 is about 15% of the agency's total budget.

Table 12. Nuclear Regulatory Commission Funding Categories

(budget authority in millions of current dollars)

Funding Category	FY2019 Approp.	FY2020 Approp.	FY2021 Approp.	FY2022 Request	FY2022 House	FY2022 S. Com.	FY2022 Approp.
Nuclear Reactor Safety	469.8	433.4	452.8	477.4	477.4	477.4	477.4
Nuclear Materials and Waste Safety	108.6	103.2	102.9	107.3	107.3	107.3	107.3
Decommissioning and Low-Level Waste	25.4	21.4	22.8	22.9	22.9	22.9	22.9
Corporate Support	299.6	289,1	271.4	266.3	266.3	266.3	266.3
Integrated University Program	15.0	2.5	16.0	0	16.0	16.0	16.0
Prior-Year Balances	-20	-38.4	-35.0	0	-16.0	-16.0	-16.0
Inspector General	12.6	12.1	13.5	13.8	13.8	13.8	13.8
Total	**911.0**	**823.1**	**844.4**	**887.7**	**887.7**	**887.7**	**887.7**

Source: Explanatory Statement for H.R. 2471; S.Rept. 117-36; H.Rept. 117-98; H.R. 4502; NRC FY2022 congressional budget justification; 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 FY2022 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*, May 6, 2021, https://appropriations.house.gov/events/hearings/fy-2022-budget-request-for-the-department-of-energy.
- *Corps of Engineers and Bureau of Reclamation*, May 24, 2021, https://appropriations.house.gov/events/hearings/fy-2022-budget-request-for-the-us-army-corps-of-engineers-and-bureau-of-reclamation.

Senate

- *U.S. Army Corps of Engineers and the Bureau of Reclamation*, June 9, 2021, https://www.appropriations.senate.gov/hearings/a-review-of-the-fiscal-year-2022-budget-submission-for-the-us-army-corps-of-engineers-and-the-bureau-of-reclamation.
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