

TITLE III
DEPARTMENT OF ENERGY
OVERVIEW OF RECOMMENDATION

The Committee recommends \$42,039,126,000 for the Department of Energy, an increase of \$6,310,057,000 above the budget request.

The Committee recommendation sets priorities by supporting the Office of Science and the Advanced Research Projects Agency-Energy [ARPA-E], leading the world in scientific computing, addressing the Federal Government's responsibility for environmental cleanup and disposal of used nuclear fuel, keeping large construction projects on time and on budget, effectively maintaining our nuclear weapons stockpile, and supporting our nuclear Navy.

INTRODUCTION

The mission of the Department of Energy [Department] is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions. To accomplish this mission, the Secretary of Energy [Secretary] relies on a world-class network of national laboratories, private industry, universities, States, and Federal agencies, which allows our brightest minds to solve our Nation's most important challenges.

The Committee's recommendation for the Department includes funding in both defense and non-defense budget categories. Defense funding is recommended for atomic energy defense activities, including the National Nuclear Security Administration, which manages our Nation's stockpile of nuclear weapons, prevents proliferation of dangerous nuclear materials, and supports the Navy's nuclear fleet; defense environmental cleanup to remediate the former nuclear weapons complex; and safeguards and security for Idaho National Laboratory. Non-defense funding is recommended for the Department's energy research and development programs (including nuclear, fossil, and renewable energy, energy efficiency, grid modernization and resiliency, and the Office of Science), power marketing administrations, the Federal Energy Regulatory Commission, and administrative expenses.

REPROGRAMMING GUIDELINES

The Committee's recommendation includes control points to ensure the Secretary spends taxpayer funds in accordance with congressional direction. The Committee's recommendation also includes reprogramming guidelines to allow the Secretary to request permission from the Committee for certain expenditures, as defined below, which would not otherwise be permissible. The Secretary's execution of appropriated funds shall be fully consistent with the

direction provided under this heading and in section 301 of the bill, unless the Committee includes separate guidelines for specific actions in the bill or explanatory statement.

Prior to obligating any funds for an action defined below as a reprogramming, the Secretary shall notify and obtain approval of the Committees on Appropriations of both Houses of Congress. The Secretary shall submit a detailed reprogramming request in accordance with section 301 of the bill, which shall, at a minimum, justify the deviation from prior congressional direction and describe the proposed funding adjustments with specificity. The Secretary shall not, pending approval from the Committee, obligate any funds for the action described in the reprogramming proposal.

The Secretary is also directed to inform the Committees on Appropriations of both Houses of Congress promptly and fully when a change in program execution and funding is required during the fiscal year.

Definition.—A reprogramming includes:

- the reallocation of funds from one activity to another within an appropriation;
- any significant departure from a program, project, activity, or organization described in the agency's budget justification as presented to and approved by Congress;
- for construction projects, the reallocation of funds from one construction project identified in the agency's budget justification to another project or a significant change in the scope of an approved project;
- adoption of any reorganization proposal which includes moving prior appropriations between appropriations accounts; and
- any reallocation of new or prior year budget authority, or prior year deobligations.

DIRECTION ON RESEARCH AND DEVELOPMENT ACTIVITIES

The Department's budget request proposes to focus on early-stage research and development activities at the expense of later-stage research and development, field validation, deployment, demonstration, consumer education and technical assistance. The Committee believes that such a limited approach will not successfully integrate the results of early-stage research and development into the U.S. energy system, and thus will not adequately deliver innovative advanced energy technologies, practices, and information to American consumers and companies. The Committee directs the Department to support a comprehensive strategy that includes early-, mid-, and later-stage research, development and market transformation activities in each applied energy research and development program office. The Department is further directed to fully execute the funds appropriated in a timely manner and to keep the Committee apprised of progress on implementing funding programs, projects, and activities.

CROSSCUTTING INITIATIVES

Grid Modernization.—The Department is directed to continue the ongoing work between the national laboratories, industry, and universities to improve grid reliability and resiliency through the stra-

tegic goals of the Grid Modernization Initiative [GMI]. The Committee recognizes the accomplishment of more than 200 partners from industry, academia and state governments in these efforts. The Department shall brief the Committee on the funding profiles, portfolio of funding opportunities and programmatic investments for the Initiative. The Committee supports the Grid Modernization Laboratory Consortium and continued implementation of the Grid Multi-Year Program Plan [MYPP] to ensure coordination across all applied program offices, including the addition of Cybersecurity, Energy Security, and Emergency Response and the Offices of Nuclear Energy and Fossil Energy recently added to the MYPP. The Committee directs the Department to emphasize national energy systems resilience modeling and improved grid-cyber resilience to address emerging national resilience challenges of the grid and related energy systems, planned investments in energy storage to improve grid flexibility and resilience, and advanced sensors and control paradigms that promise to improve energy system resilience of the grid of the future. The Committee recognizes the growing importance of training and workforce development to support grid modernization research and development, and encourages the Department to develop a plan for a pipeline of students, graduates, and professors to sustain a robust grid modernization research, design and operations capability over the long-term.

The Committee is concerned about the increasing frequency of large-scale weather events, such as severe thunderstorms, hurricanes, ice storms, and blizzards that have the capability to cause power outages and disable power grids at the state and regional level. While the ability to forecast and model extreme weather events has drastically improved in recent decades, most power grid operators lack similarly sophisticated tools to combine specific weather forecasts and data on state and regional grid infrastructure to better predict where specifically outages will be most severe, based on the specific type of weather. The GMI has excelled in recent years in working with public and private partners to develop the concepts, tools, and technologies needed to measure, analyze, predict, protect, and control the grid of the future. The Committee strongly encourages the GMI to include efforts to develop regional predictive models of weather-caused power outages in its next Grid Modernization Lab Call to address this pressing need.

Energy Storage.—The Committee supports the Department's proposed Advanced Energy Storage Initiative and urges the Department to continue furthering coordination between the Office of Electricity, the Office of Science, the Office of Energy Efficiency and Renewable Energy, and other Department offices to achieve commercially viable grid-scale storage with the most efficient use of taxpayer dollars.

The Department shall continue to use all of its capabilities to accelerate the development of storage technologies, including the basic research capabilities of the Office of Science, the technology expertise of the Office of Energy Efficiency and Renewable Energy, the grid-level knowledge of the Office of Electricity, and the rapid technology development capabilities of ARPA-E. The Committee directs the Department to coordinate efforts among various existing

Department programs to maximize efficiency of funds and expand vital research.

The Committee supports the Department's ongoing efforts to formulate the Energy Storage Grand Challenge [ESGC] initiative, as well as cost-shared demonstrations of energy storage technologies. The ESGC builds on the Department's prior research and development efforts in storage and will align Energy Storage research and development efforts to focus on technical, regulatory, and market issues necessary to achieve the technology goals. Within 180 days of enactment of this act, the Department is directed to provide to the Committee and make publically available a crosscutting research and development road-map through 2030 to illustrate the ESGC's goals. This road-map shall be focused on reducing costs and improving the performance of a diverse set of grid-scale storage technologies to meet industry needs, improve reliability and environmental performance of the electricity grid, and reduce greenhouse gas emissions.

The Committee encourages the Department and the national laboratories to have a stronger collaboration with National Aeronautics Space Administration to develop an energy storage road-map that address challenges for mobility such as electric air flight. Additionally, the Committee encourages efforts to overcome technological barriers in demonstrating the capability of electrified aircraft, such as higher energy density batteries, development of new, lower-cost materials, and the establishments of testing methods and protocols.

Long Duration Energy Storage.—To spur advances in battery storage efficacy, the Committee directs the Department to develop a research and technology development effort to investigate Long-Duration Energy Storage—in all its forms (chemical, electrochemical, thermal and mechanical)—as a critical enabler of high volumes of renewables on the grid and as the key to the future of energy innovation in buildings, transportation and the electric grid.

Arctic Energy Office.—The Committee supports the promotion of research, development, and deployment of electric power technology that is cost-effective and well-suited to meet the needs of rural and remote regions of the United States, especially where permafrost is present or located nearby. In addition, the Committee further supports research, development and deployment in such regions of enhanced oil recovery technology, including heavy oil recovery, re-injection of carbon, and extended reach drilling technologies; gas-to-liquids technology and liquefied natural gas, including associated transportation systems; small hydroelectric facilities, river turbines, and tidal power; natural gas hydrates, coal bed methane, and shallow bed natural gas; and alternative energy, including wind, geothermal, and fuel cells. The Department is directed to support a renewed focus on the Arctic region, and as a cross-cutting activity, use the Arctic Energy Office as a centralized area to support the use of energy resources, but also innovative activities, including microgrids and integrated energy systems.

Researching effects of Per- and polyfluoroalkyl substances [PFAS].—The Committee recognizes the potential long-term impacts of PFAS contamination in humans and that supercomputers are critical in this field of research. Therefore, the Committee di-

rects the Department, in coordination with the Environmental Protection Agency and the National Institute of Environmental Health Sciences Superfund Research Program, to prioritize the use of supercomputers to study the computational toxicology of PFAS.

DISLOCATED COAL MINERS ASSISTANCE

The Committee is aware of the challenges faced by dislocated coal miners due to the ongoing shifts in the energy sector. Therefore, the Committee directs the Secretary to coordinate with the Secretary of Labor to ensure dislocated coal miners receive re-employment services they are currently eligible for under the Workforce Innovation and Opportunity Act Programs.

ETHANE LONG TERM TRENDS

Not later than 1 year after the date of enactment of this act, the Secretary of Energy, in consultation with the heads of other relevant Federal departments or agencies and stakeholders, as appropriate, is encouraged to conduct a study assessing the long-term trends related to the domestic production and consumption of ethane, the export of ethane, and the opportunities for and economic benefit of investments for further domestic use. The study should include an examination of the following questions: (i) what is the potential value (direct investment, direct and indirect job creation, tax generation, etc.) of domestic manufacturing growth based on available domestic ethane supply; (ii) given demonstrated historical investment in ethane-based domestic manufacturing, and assuming it will continue given sufficient projected ethane supply, what is the opportunity cost of exporting available ethane supply in support of foreign manufacturing; (iii) what is the impact of progressive import tariffs (such as those imposed by China where value-added goods are tariffed at higher rates than the raw materials used to make them are tariffed) on ethane, ethylene and polyethylene; (iv) could these strategies by other countries, result in capital flight from the U.S. to other countries where U.S. raw materials will be upgraded to higher value-added goods and sold back to America; and (v) have other countries enacted policies around use versus exporting purity ethane.

CONTRACT COMPETITION

The Committee notes the Department and National Nuclear Security Administration [NNSA] consistently award large contracts, such as their Management and Operating contracts and contracts for cleanup and construction, to a relatively small number of companies. Although this is not prohibited, the Committee is concerned about whether the Department and NNSA are maximizing competition with these awards. Therefore, the Committee directs the Comptroller General to assess aspects of the Department and NNSA's acquisition processes. The Committee is particularly interested in the following issues:

—*Competition in recent awards.*— The Committee notes there is a perception that contracts are awarded to a small number of companies, the Committee is interested in information on how many companies in recent years have bid on and received

awards for large DOE and NNSA contracts, and the extent to which the companies are bidding on multiple solicitations.

—*Barriers to entry.*— There are a number of challenges to obtaining awards for large DOE and NNSA contracts. The Committee is interested in understanding whether there are systemic impediments that affect whether companies will do business with DOE and NNSA, whether DOE and NNSA are aware of these impediments, and if so, what the agencies have done to address them.

—*Selection criteria.*— The Committee is interested in understanding the selection criteria DOE and NNSA have used for their large contracts, how the agencies determine the selection criteria to use for a solicitation, and how the agencies determine the relative priority of those criteria.

—*Past performance information.*— The Federal Acquisition Regulations [FAR] requires contracting officers to consider past performance when awarding a contract. One source of information on contractors’ past performance is the Contractor Performance Assessment Reporting System [CPARS]. The Committee is interested in understanding how DOE and NNSA use information on past performance in making awards, particularly when many large DOE and NNSA contracts are awarded to several companies that come together to form a single purpose limited liability company, and how reliable the information in CPARS is for making determinations about companies’ past performance.

The Committee recognizes that these are interrelated and complex issues. The Comptroller General shall provide a briefing to the Committee on GAO’s plan for addressing these issues within 180 days of enactment of the act.

COMMONLY RECYCLED PAPER

The Department shall not expend funds for projects that knowingly use as a feedstock commonly recycled paper that is segregated from municipal solid waste or collected as part of a collection system that commingles commonly recycled paper with other solid waste at any point from the time of collection through materials recovery.

FREEDOM OF INFORMATION ACT REVIEW REQUESTS

The Department is directed to provide sufficient funding to increase the number of classifiers to review document requests submitted to the Department through the Freedom of Information Act.

ENERGY PROGRAMS

ENERGY EFFICIENCY AND RENEWABLE ENERGY

(INCLUDING RESCISSION OF FUNDS)

Appropriations, 2020	\$2,790,000,000
Budget estimate, 2021	719,563,000
Committee recommendation	2,848,000,000

The Committee recommends a net appropriation of \$2,848,000,000 for Energy Efficiency and Renewable Energy [EERE], an increase of \$2,128,437,000 above the budget request. Within available funds, the Committee recommends \$161,000,000 for program direction. The recommendation also includes the use of \$6,300,000 of prior year balances from fiscal year 2014 and prior.

Congressional Direction.—The Committee directs the Department to give priority to stewarding the assets and optimizing the operations of EERE-designated user facilities across the Department's complex and commends the Department for their commitment to the transformation of the National Wind Technology Center to support a large-scale grid integration research platform linked to national laboratories, universities and industry. In future budget requests, the Committee directs the Department to demonstrate a commitment to operations and maintenance of facilities that support the Department's critical missions.

Workforce Development.—The development of a skilled workforce is critical to the successful deployment and long-term sustainability of energy efficient and renewable energy technologies. The Committee encourages funding within EERE programs to be allocated to training and workforce development programs that assist and support workers in trades and activities required for the continued growth of the U.S. energy efficiency and clean energy sectors, with an emphasis on training programs focused on building retrofit and construction industries. Furthermore, the Committee encourages the Department to work with two-year, public community, and technical colleges for job training programs that lead to an industry-recognized credential in the energy workforce.

Cybersecurity.—The Committee believes cybersecurity vulnerabilities must be addressed as renewable energy technologies enter the marketplace. The Committee also believes there is a gap with respect to distributed generators and behind-the-substation generators, storage, smart buildings technologies and electric vehicles where the potential for cyberattacks will continue to grow and threaten the modern grid. Within funds recommended for EERE, not less than \$20,000,000 is recommended to bring cybersecurity into early-stage technology research and development so that it is built into new technology.

Energy Star.—The Committee supports the Department's ongoing role in Energy Star including through Home Performance with Energy Star, as well as establishing and verifying energy conservation standards and test procedures for building appliances and equipment. The Committee directs the Department to continue these activities in their current form and recommends continued robust funding. Further, the Committee previously directed the Department in the Energy and Water Development and Related Agencies Appropriations Act, 2018 (Public Law 115–141), to provide to the Committees on Appropriations of both Houses of Congress not later than 90 days after enactment, a report to review the 2009 Memorandum of Understanding related to the Energy Star Program on whether the expected efficiencies for home appliance products have been achieved. The Committee has yet to receive the report and the Department has not provided a sufficient update as to why the report is delayed. Within 30 days of enactment of this

act, the Committee directs the Department to provide a briefing to the Committee on the status of the report, and subsequently provide the report.

Plastics Innovation Challenge.—The Committee supports joint research between the Bioenergy Technologies Office and the Advanced Manufacturing Office to bring unique capabilities from the national laboratories to focus on designing new bio-derived plastics that are recyclable by design and develop new recycling technology strategies. The Committee believes that in order to address the full lifecycle and end-of-life considerations of plastics and energy-related technologies, research is necessary to focus on developing a hybrid, multidisciplinary chemical, material, and biological technology approach in process integration—from bench scale innovations to producing quantities suitable for pilot scale processing and demonstration.

Any funds obligated or expended in fiscal year 2021 by the Department for activities involving plastics recycling or management of plastic waste shall explicitly incorporate the nation's solid waste management hierarchy into such activities and place as a high priority therein the reduction of the use of virgin plastic materials. The Committee takes note that the Department has expressed an interest in innovation related to plastics use, but expects the Department to consult with the Environmental Protection Agency on the most effective means to reduce virgin plastic consumption and to report to the Committee 180 days on how its activities will help reduce virgin plastic consumption.

Reduced Emissions Study.—The Committee directs the Department to conduct a study, in consultation with outside stakeholders, evaluating potential pathways to reducing emission from the home and small commercial heating and cooling sector through the use of advanced biofuels and biofuels blends, geothermal district heating and cooling system, electric heat pumps and low-emission refrigerants. The Department shall submit the study to the Committee Congress not later than 1 year after enactment of this act.

North American Energy Research.—Improved energy research collaboration between the United States and its bordering neighbors achieves several critical strategic objectives. The three nations are each other's largest trading partners and share an abundance of energy resources. Increasing cooperation on energy research in North America creates opportunities for increased commercial collaboration and workforce development, and creates a hedge against expansive and aggressive development by nations who are seeking to overtake the United States with respect to next generation energy technologies and resources. Within available funds, the Committee recommends \$10,000,000 for a consortium of universities in the United States that has established agreements with universities in Canada and Mexico to conduct research on a broad array of energy sources and topics.

VEHICLE TECHNOLOGIES

The Committee recommends \$410,000,000 for Vehicle Technologies. The Committee recommends not less than \$7,000,000 for operations and maintenance of the National Transportation Re-

search Center, including not less than \$2,000,000 for early-stage industry technical collaborations.

Within this amount, the Committee recommends not less than \$179,700,000 for Battery and Electrification Technologies to lower the cost of batteries across light-, medium- and heavy-duty vehicles through battery processing science, advanced battery chemistries, materials research, and modeling and simulation of battery performance. The Committee recommends not less than \$40,000,000 for electric drive research and development, of which not less than \$7,000,000 is to enable extreme fast charging and advanced battery analytics. The Committee also supports efforts to improve cost, performance and charging time of plug-in electric vehicles, as well as further research into reducing the size of vehicle batteries and reducing cobalt content.

The Committee recognizes the need for clarity regarding the availability, affordability, and reliability of direct current fast chargers for electric vehicles [EVs]. The Committee directs the Department to produce a report, in partnership with the national laboratories, on the technologies and calculation methods that meet the tentative code for EV charger metering and testing published in the National Institute of Standards and Technology [NIST] Handbook 44, Section 3.40. The Department is directed to provide this report to the Committee within 180 days of enactment of this act.

The Committee encourages the Department to continue the Programs for Energy Efficient Mobility Systems, Batteries, Charging, & Electric Vehicles, and Technology Integration. These investments, which include initiatives in SMART Mobility and Big Data Solutions for Mobility, are critical to expanding U.S. energy security, economic vitality, and quality of life. Therefore, the Committee supports continued funding for research that allows the U.S. to continue its leadership in advancing state-of-the-art transportation systems science and technology. The Committee also supports early stage research to lower the cost of batteries for electric vehicles through battery processing science, materials research, and modeling and simulation of battery performance, including research on extreme fast charging.

The Committee also continues to encourage early-stage research to lower the cost of batteries for electric vehicles through battery processing science, materials research, and modeling and simulation of battery performance, including research on extreme fast charging.

The Committee recommends \$75,000,000 for Advanced Engine and Fuel Technologies for research focused on advanced fuel formulations that optimize engine performance. Within available funds, not less than \$12,500,000 is recommended for the Co-Optimization of Engine and Fuels Multi-Laboratory Consortium.

The Committee recommends \$45,000,000 for Materials Technology. Within available funds, \$35,000,000 is recommended for early-stage research on metals and research on carbon fiber-reinforced composites at the Carbon Fiber Technology Facility.

The Committee recommends \$20,000,000 to launch the SuperTruck III program to further improve the energy and freight efficiency of heavy and medium duty long- and regional- haul vehicles.

Within available funds, the Committee recommends \$66,300,000 for Outreach, Deployment, and Analysis. Within this amount, \$40,000,000 is recommended for deployment through the Clean Cities Program. The Department is encouraged to ensure balance in the award of funds to achieve varied aims in fostering broader adoption of clean vehicles and installation of supporting infrastructure. The Committee encourages the Department to explore ways in which the Clean Cities Program can leverage funding to provide greater support for electrification efforts, recognizing the strong emissions reduction and public health benefits delivered by electrification. The Committee further encourages the Department to prioritize projects in States where the transportation sector is responsible for a higher percentage of the State's total energy consumption and is the largest source of greenhouse gases. When issuing competitive grants, the Department is encouraged to include at least one Clean Cities coalition partner. Within Outreach, Deployment and Analysis, but outside of the Clean Cities Program, the Committee recommends \$20,000,000 for up to five competitive grant awards to develop Electric Vehicle Community Partner Projects that support implementation of community plans to deploy more electric vehicles and charging infrastructure.

Further, the Committee directs the Department to submit a plan to the Committee within 180 days after enactment of this act for establishing and implementing a Clean School Bus Grant Program. The purpose of the program would be to replace diesel school buses with electric school buses, deploy re-charging infrastructure, support workforce development and training, and provide planning and technical assistance to grant recipients. The plan shall prioritize award of funds to school districts serving disadvantaged communities and those that are located in air quality non-attainment areas. The plan shall include options for contracting, schedule, and funding that extend resources to the greatest number of school districts and students.

The Committee supports Advanced Vehicle Competitions, a collegiate engineering competition that provides hands-on, real-world experience to demonstrate a variety of advanced technologies and designs, and supports development of a workforce trained in advanced vehicles. The Committee recommends \$2,500,000 to support the third year of funding the four-year collegiate engineering competition, EcoCAR 4.

The Committee recommends \$10,000,000 to continue improving the energy efficiency of commercial off-road vehicles, including up to \$5,000,000 for fluid power systems. These funds shall be awarded through a competitive solicitation in which university/industry teams are eligible to apply.

With an abundant source of low-cost domestic natural gas, the Committee recognizes that this resource as a transportation fuel is becoming an alternative fuel of choice for high fuel use fleets and off-road vehicles, and provides a substantial reduction in nitrogen oxide emissions. Further research is needed on natural gas storage, engines, and fueling infrastructure optimization. Within available funds, the Committee recommends \$15,000,000 to address technical barriers to the increased use of natural gas vehicles, including medium- and heavy-duty on-road natural gas engine research and

development, energy efficiency improvements, emission after-treatment technologies, fuel system enhancements, new engine development, natural gas storage, natural gas engines, and fueling infrastructure optimization. The Committee previously directed the Department to undertake a comprehensive study, with stakeholder input, on natural gas vehicle deployment in on- and off-road transportation, identifying barriers to increased deployment of natural gas vehicles as part of the Energy and Water Development and Related Agencies Appropriations Act, 2019 (Public Law 115–244). The Committee directs the Department to provide an update to the Committees on the status of the study, and subsequently provide this study.

Within available funds, the Committee recommends \$5,000,000 to support research and development in advanced combustion and vehicle engine technology efficiency in propane engines used for light- and medium-duty applications, including research on direct injection, engine technology and the use of dimethyl ether for fuel applications.

The Committee recognizes novel engine designs can achieve significant efficiency improvements. Within available funds, the Committee recommends \$5,000,000 to support research and development on two-stroke opposed piston engines to be conducted by industry led teams.

The Committee believes that battery end-of-life management for electric vehicles, including recycling, is important in order to reduce imports of raw materials, including lithium and cobalt. Therefore, the Committee directs the Department to conduct a study on how to increase the reuse, recycling, and manufacturing of electric vehicle batteries in the United States. The Department shall submit the study to the Committee not later than 180 days after enactment of this act.

BIOENERGY TECHNOLOGIES

The Committee recommends \$244,500,000 for Bioenergy Technologies. The Committee directs the Department to recognize all commercially available feedstock in their research projects. The Committee encourages the Department to focus on defining and meeting technical targets that reduce cost of sustainable aviation fuels through the conversion of low-cost waste carbon as feedstocks. These efforts should take into account relevant global supply chains and should be coordinated with other Federal agencies, the aviation industry, national laboratories, and universities.

Within available funds, the Committee recommends not less than \$40,000,000 for Advanced Algal Systems to sustain the investment in development of algal biofuels. The Committee recommends \$10,000,000 to continue research and development activities to support carbon dioxide capture from the atmosphere into highly alkaline solutions using algae-to-energy technologies. The program is directed to continue collaboration with the Office of Science and the Office of Fossil Energy in this area.

The Committee further recommends \$35,000,000 for Feedstock Supply and Logistics, \$50,000,000 for Demonstration and Market Transformation, \$9,500,000 for Analysis and Sustainability. Within funding available for Demonstration and Market Transformation,

not less than \$37,500,000 is recommended to support the multi-year strategy for pre-pilot, pilot, and demonstration projects and not less than \$12,500,000 is recommended for the Co-Optimization of Engine and Fuels Multi-Laboratory Consortium.

The Committee further recommends \$110,000,000 for Conversion Technologies, including \$20,000,000 to continue activities of the Agile Biology Foundry. Within available funds, the Committee directs the Department to continue efforts to make full and innovative use of biomass, municipally-derived biosolids, and other carbon already available and impacting the environment, such as municipal solid waste, plastics, and livestock waste.

Further, within available funds, for Conversion Technologies, the Committee recommends \$5,000,000 to demonstrate the use of and improve the efficiency of community-scale digesters with priority given for projects in States and Tribal areas that have adopted statutory requirements for the diversion of a high percentage of food material from municipal waste streams.

Within available funds, the Committee recommends \$5,000,000 for continued support of the development and testing of new domestic manufactured low-emission, high-efficiency, residential wood heaters that supply easily accessed and affordable renewable energy and have the potential to reduce the national costs associated with thermal energy.

Within available funds, the Committee supports research to develop the foundation for scalable techniques to use CO₂ produced in various plants, such as in biorefineries, to produce higher value fuels, chemicals or materials.

Renewable Natural Gas [RNG] is a low- to negative-carbon fuel which can be sourced from a variety of renewable pathways (e.g. biomass, digesters, landfills), but deployment has been limited due to cost, the availability of technologies that can be scaled up to meaningful production volumes and concerns regarding compatibility of existing transportation and distribution infrastructure. The Committee recommends up to \$10,000,000 to perform research and development to advance the deployment of conversion processes to advance the supply of RNG as a clean fuel option, to include the assessment of associated transportation and distribution infrastructure to enable RNG use across existing and planned natural gas transportation and infrastructure networks with particular emphasis on the infrastructure compatibility of the increased hydrogen content of biomass-derived RNG.

HYDROGEN AND FUEL CELL TECHNOLOGIES

The Committee recommends \$150,000,000 for Hydrogen and Fuel Cell Technologies to maintain a diverse program which focuses on early-, mid-, and late-stage research and development and technology acceleration including market transformation. The Committee encourages regular consultation with industry to avoid duplication of private-sector activities and ensure retention of fuel cell technology and systems development in the United States. The Committee recommends not less than \$45,000,000 for technologies to advance hydrogen use for heavy-duty transportation and industrial applications.

Within available funds, the Committee recommends \$45,000,000 for Hydrogen Fuel Research and Development for efforts to reduce the cost and improve the performance of hydrogen generation and storage systems, hydrogen measurement devices for fueling stations, hydrogen compressor components, and hydrogen station dispensing components. The Department shall continue research on novel onboard hydrogen tank systems, as well as trailer delivery systems to reduce cost of delivered hydrogen. Further, the Department is directed to support research and development activities that reduce the use of platinum group metals, provide improvements in electrodes and membranes and balance-of-plant components and systems.

The Committee recommends \$3,000,000 for Systems Analysis, including research on in-situ metrology for process control systems for manufacturing of key hydrogen system components.

Within available funds, \$25,000,000 is recommended for Hydrogen Infrastructure Research and Development with emphasis on large-scale hydrogen production, including liquefaction plants, hydrogen storage, and development of hydrogen, including pipelines. Further, the Department is directed to continue the H2@Scale Initiative, which couples current research efforts within the program with new opportunities for using hydrogen to provide grid resiliency and advance a wide range of industrial processes for the production of fuels, chemicals, and materials.

The Committee recommends \$35,000,000 for Technology Acceleration activities, including \$3,000,000 for manufacturing research and development, and \$7,000,000 for industry-led efforts to demonstrate a hydrogen-focused integrated renewable energy production, storage, transportation fuel distribution/retailing system, and fuel cell system deployment. Funding is recommended to support workforce development and training programs.

The Committee further recommends \$10,000,000 for Safety, Codes, and Standards to maintain a robust program and engage State and local regulatory and code officials to support their technical needs relative to infrastructure and vehicle safety. The Department is encouraged to engage on codes and standards for developing fuel cell and hydrogen markets such as heavy-duty trucks. The Department is also encouraged to continue coordination between U.S. and international standard bodies to ensure there is one set of open (non-proprietary) global standards for fuel cell and hydrogen technologies.

The Committee encourages the Secretary to work with the Secretary of Transportation and industry on coordinating efforts to deploy hydrogen fueling infrastructure.

SOLAR ENERGY

The Committee recommends \$233,800,000 for Solar Energy.

Within available funds, the Committee recommends \$40,300,000 for Concentrating Solar Power research, development, and demonstration to reduce overall system costs, better integrate subsystem components, develop higher-temperature receivers, and improve the design of solar collection and thermal energy storage.

The Committee recommends \$35,000,000 for Balance of System Soft Costs efforts focused on reducing the time and costs for per-

mitting, inspecting, and interconnecting distributed solar and storage projects installed behind the customer's meter through standardized requirements and online application systems.

The Committee recommends not less than \$1,000,000 for the Solar Ready Vets program as a way to train America's veterans to fill the growing need for solar industry workers.

The Department is directed to continue the National Community Solar Partnership Program to increase access for community solar, particularly to individuals that do not have regular access to onsite solar, including low- and moderate-income individuals, businesses, nonprofit organizations, and States and local and Tribal Governments. The Department is directed to align the program with other existing Federal programs that serve low-income communities. The Department is further directed to provide technical assistance to States and local and Tribal Governments for projects to increase community solar, including assisting States and local and Tribal Governments in the development of new and innovative financial and business models that leverage competition in the marketplace in order to serve community solar, and use national laboratories to collect and disseminate data that assists private entities in the financing of, subscription to, and operation of community solar projects.

Further, the Committee recommends \$46,500,000 for Systems Integration and encourages the Department to address the technical barriers to increased solar penetration on the grid, including grid reliability, dispatchability, power electronics, and communications, including solar power capabilities to provide ancillary grid services.

The Committee recommends \$40,000,000 for Innovations in Manufacturing Competitiveness. Within available funds, the Committee recommends not less than \$20,000,000 for research and development focused on perovskites, including inherently scalable production methods, such as solution processing, roll-to-roll manufacturing, the science of inherent material stability, and ultra-high efficiency through tandem manufacturing.

The Department is further encouraged to develop modeling and planning tools for distributed energy resources and continue its focus within SunShot on the resilience and reliability of solar systems, as well as continue and expand programs to reduce both market barriers and soft costs, including through research on market and regulatory analysis and new techno-economic tools and methodologies for distributed energy resources.

The Committee encourages the Department to continue work to improve co-siting of solar photovoltaics with ecosystem restoration activities and to reduce the environmental impact of solar photovoltaics.

The Committee also encourages the Department to develop programs that support a skilled, robust, and diverse solar energy workforce, including indirect solar workers in jobs related to financing and permitting.

The Committee directs the Solar Energy Technologies Office, in coordination with the Office of Strategic Programs, the Wind Energy Technologies Office and the Office of Electricity, to submit a report to the Committee not later than 240 days of enactment of

this act, exploring the impact of alternative rate design options in scenarios with high penetrations of variable renewable energy.

Floating Solar Technologies.—Within available funds, the Committee recommends \$1,500,000 for competitively selected projects focused on floating solar powered aeration systems.

Rural Deployment Opportunities.—The Committee supports the continuing research and development of solar power technologies and, in particular, inquiry into the potential for expanded solar power generation across the rural landscape. Programs such as the Community Solar Power Choice Program may offer pathways to achieve both greater energy independence and support for rural communities. To promote that effort, further research is required to determine best methods to improve generation and access to markets through transmission and distribution within an economic framework to incentivize landowner participation. In addition, the Department is encouraged to consult with the Department of Agriculture to examine opportunities, across multiple mission areas, for collaboration toward this shared objective.

WIND ENERGY

The Committee recommends \$115,000,000 for Wind Energy. Within available funding, the Committee recommends \$31,800,000 for Land-Based Wind; \$68,200,000 for Off-Shore Wind; \$10,000,000 for Distributed Wind; and \$5,000,000 for Grid Integration and Analysis.

The Committee directs the Department to support the advancement of innovative technologies for offshore wind development, including freshwater, deep water, shallow water, and transitional depth installations. Within available funds, the Committee recommends not less than \$30,000,000 for the Department to prioritize early-stage research on materials and manufacturing methods and advanced components that will enable accessing high-quality wind resources, on development that will enable these technologies to compete in the marketplace without the need for subsidies, and on activities that will accelerate fundamental offshore-specific research and development such as those that target technology and deployment challenges unique to U.S. waters.

In addition, the Department is directed to support the innovative offshore wind demonstration projects being carried out by the Department, for which funding has been allocated in fiscal years prior to fiscal year 2019, and further supports efforts to optimize their development, design, construction methods, testing plans, and economic value proposition. The Committee recommends not less than \$10,000,000 to support additional project development and pre-construction activities for the offshore wind demonstration projects to help ensure success.

Within available funds, \$15,000,000 is recommended to continue work on next generation, high-efficiency lightweight turbine generators.

The Committee encourages the Department to prioritize distributed wind technologies that reduce costs and improve performance and to collaborate with industry to invest in the development and demonstration of technologies and practices that advance distrib-

uted wind. Within available funds, the Committee recommends \$10,000,000 for distributed wind.

The Committee supports research using high-performance computing, modeling and simulation, including improved models to understand atmospheric and wind power plant flow physics, and reliability and grid integration efforts. Further, the Department is directed to give priority to stewarding the assets and optimizing the operations of the Department-owned wind energy research and development facilities. Within available funds, the Committee recommends not less than \$30,000,000 for operations of research facilities at the National Wind Technology Center and not less than \$5,000,000 for research and operations of the Integrated Energy Systems at Scale [IESS], a large-scale research platform to support next-generation wind energy science, hybrid renewable energy systems manufacturing and systems integration of multiple energy generation, consumption, and storage technologies.

WATER POWER

The Committee recommends \$148,000,000 for Water Power. The Secretary is strongly encouraged to utilize existing authorities to waive cost share for small businesses and to maximize competitively awarded solicitations for industry-led research and development initiatives and project deployment.

Hydropower Technologies.—Within available funds, the Committee recommends \$39,000,000 for conventional hydropower and pumped storage activities, including \$7,000,000 for the purposes of section 242 of the Energy Policy Act of 2005 (Public Law 109–58). Within available funds, the Department is directed to continue research, development, and deployment efforts on pumped hydropower storage technologies and use cases. The Department is encouraged to continue science and modeling efforts to advance hydroelectric turbine design to increase energy production while reducing environmental impacts, including field data collection and improvements to fish tagging technology. The Committee recommends \$15,000,000 for hydropower and pumped storage modernization initiatives, including technologies, models and analytical capabilities to support integration of intermittent generation, increase grid resilience and reliability, and improve access to electricity in remote communities or those with inadequate service. Within available funds, not less than \$3,000,000 is recommended to identify opportunities for improvements in hydropower infrastructure, operations, and methods of deployment to provide benefits to other managed water systems, such as irrigation and municipal water supply. Further, within available funds, \$1,500,000 is recommended to accelerate development and demonstration of environmental mitigation technologies to address dissolved oxygen, water quality and fish passage, including for invasive species management. Furthermore, the Committee encourages close coordination between the Department and the U.S. Army Corps of Engineers, Bureau of Reclamation and other relevant agencies and industry to reduce the amount of time to permit and deploy new fish passage and invasive fish species removal technologies in rivers and waterways.

The Committee also recommends funding for new data collection and analysis to improve operations and maintenance by better understanding the impacts of changing operations on equipment failure rates, reduced availability and costs, including long-term and short-term inflow modeling work. The Committee recommends \$5,000,000 for small hydropower technology innovation and testing initiatives, including standardization, advanced materials/manufacturing and designs that reduce environmental impacts. Further, \$5,000,000 is recommended for pumped storage efforts including engineering design and physical validation for standardization of infrastructure components and civil works construction, including research in materials and manufacturing.

Marine and Hydrokinetic Technology Research, Development, and Deployment.—The Committee recommends \$109,000,000 for marine and hydrokinetic [MHK] research, development, and deployment activities, including \$60,000,000 million for a balanced portfolio of competitive solicitations to support industry-led and university research, development, demonstrations and commercialization of wave and current (ocean, river, tidal) systems and component technologies to increase energy capture, reliability, survivability, and integration into local or regional grids for lower costs and to assess and monitor environmental effects.

Within available funds, the Committee recommends not less than \$24,000,000 to support research and development, testing, and partnership activities for this new Powering the Blue Economy initiative. The Committee directs the Department to utilize existing core capabilities within its national laboratories to execute this work, in partnership with universities and industry. Further, the Department is encouraged to also focus on activities that address the integration of clean energy systems for remote communities and port electrification, including demonstration of marine energy, distributed wind, solar, energy storage, improved microgrids, and local production of zero-carbon fuels. Within available funds, \$5,000,000 is recommended for the environmental analyses and engineering of potential run-of-river hydrokinetic facilities at two sites with high electricity costs and diesel use, as determined by the Secretary. Funding may be used for such related field work, engineering, and analysis necessary for a future Federal Energy Regulatory Commission license.

The Committee recommends \$10,000,000 to continue the activities of the Testing Expertise and Access for Marine Energy Research [TEAMER] program and related infrastructure investments. Further, \$10,000,000 is recommended to prioritize infrastructure needs at marine and hydrokinetic technology testing sites operated by Marine Renewable Energy Centers.

The Committee recommends up to \$5,000,000 to continue operations at the recently awarded Atlantic Marine Energy Center to accelerate the transition of wave and tidal energy technologies to market.

The Department is directed to continue its coordination with the U.S. Navy on marine energy technology development for national security applications at the Wave Energy Test Site and other locations.

The Committee recognizes the challenges of decarbonizing remote communities and the maritime sector. The Department is encouraged to focus on activities that address the integration of clean energy systems for remote communities and port electrification, including the demonstration of marine, distributed wind, solar, energy storage, improved microgrids, and local production of zero-carbon fuels.

GEOTHERMAL TECHNOLOGIES

The Committee recommends \$105,000,000 for Geothermal Technologies to focus on early- through late-stage research and development and market transformation activities to advance geothermal strategies and implementation of the recommendations outlined in the GeoVision study. The Committee also recommends focusing on developing and validating innovative and cost-competitive technologies and tools to support commercial development of enhanced geothermal systems, such as testing stimulation methods in new wells of opportunity and developing at least one additional Frontier Observatory for Research in Geothermal Energy [FORGE] site; supporting research and technology development to locate, access, and develop hidden geothermal resources; and investing in research and technology development efforts to use the subsurface for reservoir thermal energy storage as part the Department's Advanced Energy Systems initiative.

Within available funds, \$64,000,000 is recommended for Enhanced Geothermal Systems. To facilitate necessary technology development and expand understanding of subsurface dynamics, the Committee recommends \$20,000,000 for the continuation of activities of FORGE, with activities to include ongoing novel subsurface characterization, full-scale well drilling, and technology research and development to accelerate the commercial pathway to largescale enhanced geothermal systems power generation. The Committee further recommends not less than \$10,000,000 for the Wells of Opportunity program.

Further, the Committee recommends \$20,000,000 for Hydrothermal, \$15,000,000 for Low-Temperature and Co-produced Resources, and \$6,000,000 for Systems Analysis.

The Committee directs the Department to continue its efforts to identify prospective geothermal resources in areas with no obvious surface expressions. Within available funds, \$10,000,000 is recommended to fund at least one demonstration project in such an area with no obvious surface expressions, to develop deep, direct-use geothermal technologies to distribute ground-source heating through an integrated energy system or district heating system

RENEWABLE ENERGY GRID INTEGRATION

To facilitate the oversight of grid integration activities among renewable energy technologies, the Committee establishes a new funding line and recommends \$40,000,000 to be provided from across the Solar Energy, Wind Energy, Water Power, and Geothermal Technologies programs. Further, within available funds, the Committee recommends \$10,000,000 for development and demonstration of an "energysched" management system that addresses a discrete geographic area in which renewable sources currently

provide a large portion of electric energy needs, where grid capacity constraints result in curtailment of renewable generation, and with very substantial existing deployment of interactive smart meters. The “energyshed” design should achieve a high level of integration, resilience and reliability among all energy uses, including both on-demand and long-time energy scales, transmission and distribution of electricity.

ADVANCED MANUFACTURING

The Committee recommends \$395,000,000 for Advanced Manufacturing.

The Committee recommends \$25,000,000 for operation of the Manufacturing Demonstration Facility and the Carbon Fiber Technology Facility. Within available funds for the Manufacturing Demonstration Facility, \$5,000,000 is recommended for the development of processes for hybrid materials solutions with prescribed microstructural and mechanical properties to enable precise property profiles for born qualified and certified components.

The Committee supports additive manufacturing technologies for wind energy applications. Within the amounts recommended, \$4,000,000 is to support additive manufacturing work on large wind blades that will allow for rapid prototyping, tooling, fabrication, and testing; \$7,000,000 is for additive manufacturing of wind turbine components; and \$18,000,000 is for advanced wind turbine blade manufacturing research, including additive composite tip technology, automation, and sustainability.

The Committee recognizes the importance of developing recyclable wind turbine blades and directs the Department to support research and development in innovative approaches to enable manufacturing of wind turbine blades with novel thermoplastic resin systems to create brand new reversible and recyclable thermoplastic resins for future use in blade manufacturing. Within available funds, the Committee recommends \$5,000,000 for development of thermoplastic resin systems research for wind turbine manufacturing.

The Committee recognizes the Department’s expertise in developing materials and processes for very high temperature applications. Silicon carbide ceramic matrix composites are a proven, capable material for high temperature applications. The Committee recommends \$5,000,000 to continue to develop and industrialize a low-cost polymer infiltration process for the fabrication of silicon carbide components. The Committee encourages the Department to leverage best practices from large-scale, high-rate commercial composite aero-structure manufacturing.

To remain globally competitive, the Committee recognizes the U.S. aerospace industry must continually increase efficiencies to meet increasing production rate demands and the Committee recognizes the Department’s success in partnering with industry to solve its most challenging problems, including the development and deployment of artificial intelligence and machine learning. Within available funds, the Committee recommends not less than \$5,000,000 to apply the Office of Science’s leadership computing facility expertise in machine learning to increase efficiencies in large-scale, high-rate aerostructures manufacturing.

Within available funds, the Committee recommends not less than \$10,000,000 to support research, development, and demonstration projects to advance the development and commercialization of direct air capture technologies. The program is directed to continue collaboration with the Office of Science and the Office of Fossil Energy in this area.

The Committee recognizes the important role large-area additive manufacturing can play in helping to advance the deployment of building, transportation, and clean energy technologies. The Committee directs the Department to further foster the partnership between the national laboratories, universities, and industry to use bio-based thermoplastics composites, such as micro- and nanocellulosic materials, and large-area 3-D printing to overcome challenges to the cost and deployment of building, transportation, and energy technologies. In addition, the Committee recommends \$20,000,000 to continue the development of additive manufacturing involving nanocellulosic feedstock materials made from forest products to overcome challenges to the cost and deployment of building, transportation, and energy technologies, and encourages the Department to leverage expertise and capabilities for large-scale additive manufacturing through partnerships between universities and the Manufacturing Demonstration Facility.

The Committee recognizes water and energy are critical resources that are inextricably linked, and that understanding the interdependencies and vulnerabilities is increasingly critical for the Department's mission. The Committee recommends \$25,000,000 for the fifth year of research and development efforts to lower the cost and energy intensity of technologies to provide clean, safe water through the Energy-Water Desalination Hub.

The Committee recommends \$42,000,000 to support the Clean Energy Manufacturing Institute [CEMI] program. Within available funds, the Committee recommends \$14,000,000 for the final year of funding for the recently awarded Cybersecurity in Energy Efficient Manufacturing Institute. Furthermore, within available funds, \$28,000,000 is provided to create two new institutes. The Committee supports the work of the CEMIs as integral to the growth and security of the Nation's manufacturing base. Further, the Committee strongly supports the REMADE Institute, specifically its five distinct research areas. However, the Committee objects to the Department's attempts to change originally agreed-upon and awarded areas of CEMI focus. The Department shall not require a CEMI, like REMADE, to spend appropriated funds within a specific timeframe that does not best support ongoing research and development. To that end, of amounts previously appropriated, \$35,000,000 shall be spent on projects awarded in the fourth round of solicitations, of which not more than \$15,000,000 shall be committed to the Plastics Innovation Challenge, and \$10,000,000 for a fifth solicitation. The Department is directed to provide a briefing to the Committee on its efforts to support ongoing projects at CEMIs within 60 days of enactment of this act.

The Committee recommends \$25,000,000 to continue the Critical Materials Institute. The Committee supports funding necessary to improve and increase activities at all levels of the critical materials supply chain, including technologies for mining and metallurgy.

The Committee directs the Department to produce a report on the opportunities for technological development in the production of advanced Si-C anode materials for Li-on batteries and how the Department would promote integration of a domestic supply chain. The Department is directed to report to the Committee within 90 days of enactment of this act.

The Committee recognizes that progress is occurring at the demonstration level of extracting lithium from geothermal brine to create lithium chloride, but further research and development is needed to convert the extracted lithium chloride into lithium hydroxide, one of the final components of lithium-ion batteries. The Committee recommends \$5,000,000 to continue technology development to convert lithium chloride from geothermal brine into lithium hydroxide that will inform the design of a commercial-scale facility that will both extract lithium from geothermal brine and convert the lithium in geothermal brine into the lithium hydroxide.

The Committee reminds the Department that biomass is a viable energy source for district energy and directs the Department to take that into consideration in its funding opportunity announcements. Therefore, within available funds, the Committee recommends \$10,000,000 for district heating, within which the Department shall make grants to support capital construction costs of demonstration projects that deploy community district heating projects in association with a biomass-fueled municipal generating station.

The Committee recommends \$45,000,000 for the Industrial Technical Assistance program. Within this amount, the Committee recommends \$12,000,000 to provide ongoing support for the Combined Heat and Power [CHP] Technical Assistance Partnerships [TAPs] and related CHP Technical Partnership activities at the Department, including \$5,000,000 for the TAPs and \$7,000,000 for related CHP activities; \$12,000,000 for 32 Industrial Assessment Centers [IACs]; and \$3,000,000 for wastewater treatment technical assistance. The Committee encourages the Department to expand on the technical assistance provided by the IACs to address these needs, including by equipping the Directors of the IACs with the training and tools necessary to provide technical assistance on energy savings to these facilities. Within the funds provided for the IACs, the Department is encouraged to provide funding for applied technical assistance and the purchase of innovative technology developed through federally funded research, with an emphasis on technical demonstration of innovative water treatment at a greater than residential scale.

Within available funds, the Committee recommends up to \$10,000,000 to continue the development of alternatives to fossil-fuel based process heating technologies for use in manufacturing, including technologies that could be used to reduce emissions from industrial drying processes.

The Committee recognizes the importance of smart manufacturing technologies, which can enhance energy savings and improve the global competitiveness of American manufacturers. The Committee notes that it is still awaiting the national smart manufacturing plan directed in the Energy and Water Development and Related Agencies Appropriations Act, 2019 (Public Law 115–244),

and directs the Department to provide this plan to the Committee within 60 days of enactment of this act.

The Committee recognizes that meeting growing global demands for the use of more sustainable chemistry in consumer and commercial products has the potential to create significant economic opportunities for U.S. manufacturing that can be enhanced by ensuring that sustainability factors are considered in new chemicals development. Within available funds, the Committee recommends \$5,000,000 for activities to support chemistry research and development incorporating criteria of commercial need, energy efficiency and human health and environmental effects considerations for chemicals and chemical production processes.

BUILDING TECHNOLOGIES

The Committee recommends \$295,000,000 for Building Technologies.

Within available funds, the Committee recommends \$50,000,000 for the Commercial Building Integration program for core research and development of more cost-effective integration techniques and technologies that could help the transition toward deep retrofits. In addition, the Committee encourages the Department to increase engagement with private sector stakeholders to develop market-transforming policies and investments in commercial building retrofits.

Within available funds, the Committee recommends \$40,000,000 for the Residential Building Integration program. The Committee encourages funding to be concentrated on industry teams to facilitate research, demonstrate and test new systems, and facilitate widespread deployment and dissemination of information and best practices through direct engagement with builders, the construction trades, equipment manufacturers, smart grid technology and systems suppliers, integrators, and State and local governments. Further, the Committee recommends funding to facilitate whole-house energy efficiency retrofits (including outreach, engagement and training to private sector contractors), including continuing efforts to advance smart home technology.

The Committee supports innovative housing research to encourage the design, construction and retrofitting of energy efficient, fire hardened and resilient residential homes and commercial buildings, and encourages the Building America Program to prioritize funding for wildfire/resiliency solutions that also meet the energy code and reach codes. The Committee encourages collaborative efforts between the Building America Program with the national laboratories, private industry, university-based wildfire researchers, community-based organizations and local communities that are making notable progress in developing construction techniques and identifying building materials to actively mitigate fire risk in areas susceptible to catastrophic wildland fire, including the wildland urban interface.

The Committee supports continued efforts to address property rating and valuation in commercial and residential buildings as a way to improve the transparency of energy utilization in buildings for persons and companies buying or leasing property.

The Committee recommends not less than \$153,000,000 for the Emerging Technologies subprogram. The Committee appreciates the Department's efforts to expand field validation and testing of transactive energy systems technologies to continue moving this technology toward commercialization. The Department is encouraged to prioritize understanding of regional differences in energy systems and their impact on adoption of transactive energy technologies. The Committee recommends not less than \$30,000,000 for building-grid integration research and development consistent with a transactive energy system and in coordination with the Office of Electricity transactive energy systems program. Within available funds, \$8,000,000 is recommended to continue promoting regional demonstrations of new, utility-led, residential Connected Communities advancing smart grid systems. Further, within available funds for Emerging Technologies, the Committee recommends not less than \$18,000,000 for Heating, Ventilation, and Air Conditioning and Refrigeration Research and Development, including air sourced heat pumps, water heaters, and boilers. Further, the Department is encouraged to focus research and development efforts to address whole building energy performance and cost issues for air source heat pumps to inform efforts to advance electrification without compromising building energy performance. The Committee also recommends \$14,000,000 for Building Envelope and \$5,300,000 for Building Energy Modeling. The Committee encourages the Department to include field evaluation efforts in these programs.

Within available funds for Emerging Technologies, the Committee recommends \$30,000,000 for research, development, demonstration, field evaluation, and commercial application activities related to advanced solid-state lighting technology development. If the Secretary finds solid-state lighting technology eligible for the Twenty-First Century Lamp prize, specified under section 655 of the Energy Independence and Security Act of 2007 (Public Law 110-140), \$5,000,000 shall be made available to fund the prize or additional projects for solid-state lighting research and development.

The Committee notes that natural gas and propane gas play an important role in meeting the energy needs of U.S. homes and commercial buildings. The Committee encourages the Department to continue to explore research and development that can advance future natural gas and propane gas systems and appliances to meet consumer demand for high efficiency and environmentally friendly products. The Committee recommends continued research, development, and market transformation programs on energy efficiency efforts related to the direct use of natural gas and propane gas in residential applications, including gas heat pump heating with power generation and water heating, on-site combined heat and power, and gas appliance venting, and on site (micro) combined heat and power to include integration with renewables.

Thermally-driven heat pumps [THPs] offer the next generation of space conditioning and/or water heating for low-load buildings and have the potential to reduce greenhouse gas emissions by 40 percent or greater from a condensing gas efficiency baseline. Further work is needed to test and evaluate these technologies in the field.

The Committee encourages the Department to establish a Thermal Heat Pump Consortium, led by a non-profit, to integrate and deploy new THP technologies in a joint industry partnership.

Within available funds, the Committee recommends \$5,000,000 for novel earlier-stage research, development, and demonstration of technologies to advance energy efficient, high-rise Cross-Laminated Timber [CLT] building systems. The Committee directs the Department to support university research, in partnership with national labs, for developing, building, and evaluating CLT wall systems for embodied energy content, operating energy efficiency, wall moisture profiles, structural connector durability, and health monitoring sensors.

Within available funds, the Committee recommends \$10,000,000 for a competitive solicitation focused on the development and integration of energy efficient building techniques and technologies suitable for environments with extremely high or low temperatures. Priority shall be given to those with prior experience serving low-income residents living in extreme environments.

The Committee recommends \$52,000,000 for Equipment and Buildings Standards. The Committee recommends \$7,000,000 for the Building Energy Codes Program to provide technical assistance to States and municipal governments and to organizations that develop model codes and standards to improve building resilience as well as efficiency. The Committee notes that the Department is missing legal deadlines for over 25 energy efficiency standards mandated by Congress. The Committee directs the Department to finalize these standards as soon as practicable, and report to the Committee within 30 days of enactment of this act on the status of each of these standards, and any funding or staffing barriers to finalizing these standards.

Within available funds, the Committee recommends \$5,000,000 to continue to demonstrate the use of ice storage technology to enable load-shifting to offset electrical grid capacity peaks at lower costs than electrochemical storage at public-use buildings such as State office buildings, hospitals, and schools.

FEDERAL ENERGY MANAGEMENT PROGRAM

The Committee recommends \$40,000,000 for the Federal Energy Management Program.

Within available funds, \$11,000,000 is recommended for the Assisting Federal Facilities with Energy Conservation Technologies program and \$28,000,000 for base funds

Within available funds, \$2,000,000 is recommended for the Performance Based Contract National Resource Collaborative Initiative. The Committee looks forward to receiving the report previously directed in the Energy and Water Development and Related Agencies Appropriations Act, 2020 (Public Law 116-94), regarding the expansion of performance-based contracts nationwide.

WEATHERIZATION AND INTERGOVERNMENTAL PROGRAM

The Committee recommends \$372,500,000 for the Weatherization and Intergovernmental Program.

Within this amount, \$310,000,000 is recommended for the Weatherization Assistance Program [WAP], including \$305,000,000

for Weatherization Assistance Grants and \$5,000,000 for Training and Technical Assistance; and \$62,500,000 is recommended for State Energy Program grants.

The Committee encourages the Department to work with all relevant stakeholders to identify efficiencies for delivering weatherization services and examine options to streamline policies and procedures when other funding sources are utilized in conjunction with funds from the Department. Further, the Committee recognizes the importance of providing Federal funds under the Weatherization and Intergovernmental Program to States and Tribes in a timely manner to avoid any undue delay of services to eligible low-income households, and to encourage local high-impact energy efficiency and renewable energy initiatives and energy emergency preparedness. Therefore, the full amount of the funds recommended for WAP and the State Energy Program shall be obligated to States, Tribes, and other direct grantees not later than 60 days after enactment of this act. Similarly, in order for WAP to function effectively, it is important for States to provide funding to local weatherization implementers as quickly as appropriate, and for the local providers to implement projects as quickly as possible.

Within available funds, the Committee recommends \$1,000,000 for WAP grant recipients that have previously worked with the Department via the Weatherization Innovation Pilot Program to now implement and demonstrate programs to treat harmful substances, including vermiculite, at the State and regional level.

The Committee supports WAP's continued participation in the interagency working group on Healthy Homes and Energy with the Department of Housing and Urban Development. The Department is encouraged to further coordinate with the Office of Lead Hazard Control and Healthy Homes on energy-related housing projects. The Committee directs the Department to begin tracking the occurrence of window replacements, which supports the reduction of lead-based paint hazards in homes.

CORPORATE SUPPORT

Strategic Programs.—The Committee recommends \$14,500,000 for Strategic Programs. Within available funds, \$3,000,000 is recommended for the Energy Transition Initiative [ETI] to support initiatives to address high energy costs, reliability, and inadequate infrastructure challenges faced by island and remote communities. The Committee supports ETI's efforts to develop a cross-sector initiative alongside community-based organizations pursuing energy transition efforts that will address energy challenges, build capacity, accelerate the sharing of best practices and innovations between similarly-situated regions, and to leverage specialized, local expertise into commercial opportunity. The Committee directs the Department to support community-based initiatives by partnering with community-based organizations, and leverage the Department's previously-developed tool, to build cost-effective, resilient energy infrastructure on island and remote communities, including in Alaska, Hawaii, New England, the Caribbean, and elsewhere.

Facilities and Infrastructure.—The Committee directs the Department to proceed with project engineering and design for the Energy Materials and Processing at Scale research capability at

the National Renewable Energy Laboratory, which received Critical Decision-0 in December 2019. Not less than \$6,000,000 is recommended for Other Project Costs and to commence Project Engineering and Design. The design should enable and encourage partnerships with U.S. industry to incentivize waste reduction, reuse, and reduced persistence in the environment, as well as accelerate innovations to market viability.

CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE

Appropriations, 2020	\$156,000,000
Budget estimate, 2021	184,621,000
Committee recommendation	156,000,000

The Committee recommends \$156,000,000 for the Office of Cybersecurity, Energy Security, and Emergency Response, a decrease of \$28,621,000 below the budget request. Within available funds, the Committee recommends \$11,521,000 for program direction.

CYBERSECURITY FOR ENERGY DELIVERY SYSTEMS

The Committee recommends \$96,479,000 for Cybersecurity for Energy Delivery Systems.

The Committee recommends \$10,000,000 for the DarkNet project to explore opportunities for getting the Nation’s critical infrastructure off the Internet and shielding the Nation’s electricity infrastructure from disruptive cyber penetration, including expansion of the communications network architecture and development of cutting-edge networking technologies. This effort shall be closely coordinated with the Office of Electricity.

Within available funds, the Committee recommends \$5,000,000 for Consequence-driven Cyber-informed Engineering.

Within available funds, the Committee recommends \$4,000,000 for university-based research and development of scalable cyber-physical platforms for hyper-resilient and secure electric power systems that are flexible, modular, self-healing, and autonomous.

The Committee supports extension of cyber-risk information sharing tools to close remaining vulnerabilities in the distribution and transmission system. The Committee encourages the Department to continue existing work within ongoing programs and to invest in research addressing power system vulnerabilities in supply chain and life cycle management for critical power system components and advanced adaptive defensive methods for grid control systems.

The Committee is supportive of Departmental initiatives focused on cybersecurity risk information-sharing and secure data anonymization and analysis for both operational and information technology components of equipment commonly utilized in both the bulk power system and distribution systems. The Department is encouraged to prioritize enrolling under-resourced electric utilities in such programs, particularly rural electric cooperatives and municipally-owned entities.

INFRASTRUCTURE SECURITY AND ENERGY RESTORATION

The Committee recommends \$48,000,000 for Infrastructure Security and Energy Restoration.

Within available funds, the Committee recommends not less than \$6,000,000 for the continued advancement of EAGLE–I. The Committee supports further development of energy sector situational awareness capabilities through EAGLE–I, the Federal Government’s situational awareness tool for national power outages.

ELECTRICITY

Appropriations, 2020	\$190,000,000
Budget estimate, 2021	195,045,000
Committee recommendation	223,000,000

The Committee recommends \$223,000,000 for the Office of Electricity, an increase of \$27,955,000 above the budget request. Within available funds, the Committee recommends \$18,000,000 for program direction. The Committee supports planning and contingency analyses that address vulnerabilities in the North American energy system. This work will help to identify transmission infrastructure investments, strategic uses and placement of energy storage systems, and other strategies to help mitigate risk and ensure the security and resilience of the grid.

TRANSMISSION RELIABILITY AND RESILIENCE

The Committee recommends \$51,000,000 for Transmission Reliability and Resilience.

Within available funds, the Committee recommends \$10,000,000 for the Grid Research Integration and Demonstration Center to advance technologies in support of modernizing the electric delivery system and understanding the Nation’s electricity infrastructure using real-time data.

The Committee supports continued investment in advanced grid modeling algorithms and tool development to ensure resilient grid controls and protection systems that meet the challenges of the emerging smart grid.

The Committee looks forward to receiving the report previously directed in the Energy and Water Development and Related Agencies Appropriations Act, 2020 (Public Law 116–94), outlining the barriers and opportunities for technologies that provide increased, more efficient, and/or more effective delivery over the existing transmission network.

RESILIENT DISTRIBUTION SYSTEMS

The Committee recommends \$58,000,000 for Resilient Distribution Systems.

Within available funds, the Committee recommends \$20,000,000 for the COMMANDER [Coordinated Management of Microgrids and Networked Distributed Energy Resources] National Test Bed Laboratory to establish a data link for a back-up operations center that can benefit utility companies across the country and support the North American Energy Resilience Model.

The Committee directs the Department to focus on identifying and addressing technical and regulatory barriers impeding grid integration of distributed energy systems to reduce energy costs and improve the resiliency and reliability of the electric grid.

The Committee supports advanced control concepts and open test beds for new distribution control tools for enhanced distribution system resilience.

Within available funds, the Committee directs the Department to continue efforts to support the integration of sensors into the nation's electric distribution systems, fundamental research and field validation of microgrid controllers and systems, and transactive energy concepts, including studies and evaluations of energy usage behavior in response to price signals. The Committee places a high priority on addressing the challenges facing the electric power grid by developing the innovative technologies, tools, and techniques to modernize the distribution portion of the electricity delivery system. Resilient Distribution Systems pursues strategic investments to improve reliability, resilience, outage, recovery, and operational efficiency, building upon previous and ongoing grid modernization efforts. In addition to emerging fuel technologies for distributed grids, the Committee recommends that fuels commonly available across the United States—such as propane and other diesel alternatives—be evaluated.

The Committee recommends that funds provided for the Advanced Grid Integration Division shall focus on identifying and addressing technical and regulatory barriers impeding grid integration of distributed energy systems to reduce energy costs and improve the resiliency and reliability of the electric grid.

Within available funds, the Committee recommends \$5,000,000 for a demonstration project with the Department's Grid Sensors and Sensor Analytics program. The demonstration should include a focus on utilizing data from distribution utilities that have deployed advanced metering infrastructure.

ENERGY STORAGE

The Committee recommends \$80,000,000 for Energy Storage, including \$30,000,000 for the Grid Storage Launchpad.

Within available funds, the Committee continues to support development of an operational energy storage test facility capable of performance-driven data in a utility environment.

The Committee is supportive of research for novel materials and system components to resolve key cost and performance challenges for electrochemical energy storage systems based on earth abundant advanced chemistries. In addition, the Committee supports continued materials research that will improve the understanding and predictability of energy storage systems and components, as well as enable safer and more reliable materials and systems to be developed.

The Committee encourages the Department to allocate resources to provide training and technical assistance to firefighters and code inspectors on battery storage, such as through scenario-based in-person or online training.

To continue and further advance the development and demonstration of grid-scale battery energy storage projects, the Committee recommends \$10,000,000 for battery storage demonstration projects that are located in areas where grid capacity constraints result in curtailment of renewable generation; improve grid resilience for a public utility that is regularly affected by weather re-

lated natural disasters; and provide rate reduction and renewable energy benefits to businesses, farms, and residents in an economically-stressed rural area. Direct storage from solar generation may also be incorporated.

TRANSFORMER RESILIENCE AND ADVANCED COMPONENTS

The Committee recommends \$8,000,000 for Transformer Resilience and Advanced Components.

Within available funds, the Committee directs the Department to continue to support research and development for advanced components and grid materials for low-cost power flow control devices, including both solid-state and hybrid concepts that use power electronics to control electromagnetic devices and enable improved controllability, flexibility, and resiliency.

The Department is directed to support research and development to find safe and effective capture and reuse technologies, or safe and effective alternatives, for the use of sulfur hexafluoride in power generation and transmission equipment, including circuit breakers, switchgear, and gas insulated lines.

NUCLEAR ENERGY

Appropriations, 2020	\$1,493,408,000
Budget estimate, 2021	1,179,931,000
Committee recommendation	1,505,300,000

The Committee recommends \$1,505,300,000 for Nuclear Energy, an increase of \$325,369,000 above the budget request. The Committee’s recommendation prioritizes funding for programs, projects and activities that will ensure a strong future for nuclear power in the United States.

Nuclear Energy provides nearly one-fifth of our Nation’s electricity, and nearly 60 percent of our carbon free electricity. While there is no practical way to combat greenhouse gas emissions without nuclear power as part of the solution, the nuclear industry continues to struggle. Reactor plants continue to close early, and new construction is almost nonexistent, primarily due to cost. Revitalization of our nuclear industry through technological advancement would have many benefits. First, it would enable replacement of aging nuclear plants in the United States with safe, affordable advanced reactors. For that to be possible, urgent action is required since a large portion of the current nuclear fleet reaches retirement over the next 15 years.

Second, a revitalized nuclear industry would give U.S. Industry the opportunity to compete as the global demand for nuclear power grows. The World Nuclear Association estimates there are nearly 30 countries planning or starting nuclear programs. International support of new reactor programs is dominated by China and Russia, while the U.S. presence is limited. Nuclear projects, such as building a nuclear power plant in a foreign country, will result in long-term relationships between governments that span several decades and have tremendous influence across the spectrum of geopolitical issues.

Finally, the United States has always been the international leader for nuclear safety and nonproliferation. To continue to lead,

we must have a role in the international growth in nuclear power. We need to participate in a meaningful way. Absent that, we cannot expect the high standards of safety and nonproliferation will be maintained outside of the United States.

The Department of Energy, in consultation with the National Nuclear Security Administration, is directed to contract with the National Academy of Sciences [NAS] not later than 60 days after enactment of this act to conduct a comprehensive, independent study on the non-proliferation and security risks and international safeguards challenges associated with advanced nuclear reactors and related fuel cycle technologies. The NAS shall convene a committee whose members have expertise in advanced nuclear reactors, nuclear non-proliferation and security, enrichment and reprocessing, and other areas of expertise that the NAS deems essential for completion of the study. The NAS committee's consensus study report shall also provide findings and recommendations that may consider policy options as long as they do not involve non-technical value judgments. The study shall include assessments of the proliferation implications of high-assay low-enriched uranium, uranium-plutonium mixed oxide fuel, and advanced fuel cycles that require separating plutonium from spent fuel. The study shall also address the extent to which advanced reactors and associated fuel cycle facilities, in their design and operations, support International Atomic Energy Agency safeguard activities, particularly those related to nuclear material accounting and control as well as containment, surveillance, monitoring, and timeliness of detection of diversion. Advanced reactor technologies shall include the designs under consideration by the Generation IV International Forum and by the Department of Energy and any related fuel cycle technologies. The study shall be submitted to the Committee within 18 months after the Department and NAS enter into a contractual agreement.

The Department of Energy can and should play a more active role in supporting the revitalization of the U.S. nuclear industrial base. Without a clear vision and broad commitment across government and industry, nuclear power in this country will become non-existent. The Committee recommends a realignment of funding across the Office of Nuclear Energy to focus on needed research, development and demonstration that supports the current nuclear fleet and enables a future for nuclear power.

INTEGRATED UNIVERSITY PROGRAM

The Committee recommends \$5,000,000 for the Integrated University Program.

The Committee notes the administration repeatedly attempts to defund this program, despite continued success in developing highly qualified nuclear specialists to meet national needs.

SUPERCritical TRANSFORMATIONAL ELECTRIC POWER

The Committee recommends \$5,000,000 for Supercritical Transformational Electric Power Research and Development.

The Committee supports the collaborative efforts between the national laboratories and industry partners to develop test capabili-

ties and validate grid-compatible supercritical carbon dioxide Brayton cycle systems by April 2021.

NUCLEAR ENERGY ENABLING TECHNOLOGY

The Committee recommends \$135,369,000 for Nuclear Energy Enabling Technology.

Within Nuclear Energy Enabling Technology, the Committee recommends an additional \$2,000,000 to begin preconceptual design of a secure, separate, and shielded beamline at the NSLS II at Brookhaven National Laboratory to examine radioactive materials. Currently, there is no U.S. facility dedicated to the study of radioactive materials with the high spatial and temporal resolution, superb chemical sensitivity and unique capabilities offered by the NSLS II. This beamline should complement and be compatible with irradiation tests and infrastructure for materials characterization and sample preparation at Idaho National Laboratory. In conjunction with the infrastructure and capabilities at INL, the information on materials in radiation environments derived from this beamline will be used to improve the reliability, sustain the safety, and extend the life of current reactors, and support development of new advanced reactors.

Joint Modeling and Simulation Program.—The Committee understands the importance of modeling and simulation nuclear energy applications, and recommends \$40,000,000 for the Joint Modeling and Simulation Program. Use and application of the codes and tools should be funded by the end user, not by the Joint Modeling and Simulation Program.

New Materials Development.—The Committee recommends \$5,000,000 for the New Materials Development program, a new program to strengthen the pipeline of new materials that can make the current fleet, as well as new advanced reactors, more resilient and more economically competitive.

FUEL CYCLE RESEARCH, DEVELOPMENT, AND DEMONSTRATION

The Committee recommends \$289,500,000 for Fuel Cycle Research, Development, and Demonstration.

Material Recovery and Waste Form Development.—The Committee recommends \$25,000,000 for Material Recovery and Waste Form Development, including \$10,000,000 to continue work on the ZIRCEX process to recover Highly Enriched Uranium from used naval fuel or unirradiated research reactor fuel.

Accident Tolerant Fuels.—The Committee recommends \$115,000,000 for development of nuclear fuels with enhanced accident-tolerant characteristics to significantly mitigate the potential consequences of a nuclear accident. Within the amounts for accident-tolerant fuels development, not less than \$55,600,000 is recommended to continue the participation of three industry-led teams in Phase 2B of the cost-shared research and development program; \$25,000,000 is recommended to support testing of these materials at Idaho National Lab and Oak Ridge National Lab, and also support the implementation of new and expanded capabilities in those labs (such as increased irradiation test capacity, improved instrumentation, and new post-irradiation examination capabilities); and not less than \$20,000,000 is recommended for industry-led efforts

in testing, code development, and licensing of higher-enriched and higher burnup fuels. Of the amount recommended for higher-enriched and higher burnup fuels not more than \$4,000,000 may be provided directly to the national laboratories. Further, not less than \$10,000,000 is recommended specifically for development of silica-carbide ceramic fuels for light water reactors. The Committee continues to place a high priority on this program and urges the Secretary to maintain focus and priority on achieving results in these efforts. The Committee remains concerned that funding for the industry-led portions of the Accident Tolerant Fuels program, and for the testing and development of higher-enriched and higher-burnup fuels, is not being obligated by the Department in a timely manner. The Department is directed to brief its plan to allocate and obligate funds required in this act and in the Energy and Water Development and Related Agencies Appropriations Act, 2020, and any negative schedule impacts caused by the delays in allocating or obligating funding.

TRISO and Graphite Materials.—Within the funds recommended for Tristructural Isotropic fuels, \$10,000,000 is to continue the transition of TRISO fuel to a multiple-producer market, ensuring that more than one industry source would be available to the commercial and government markets.

Used Nuclear Fuel Disposition.—The Committee continues to strongly support the recommendations of the Blue Ribbon Commission on America's Nuclear Future and believes that near-term action is needed to address the accumulating inventory of spent nuclear fuel. The Committee recommends \$27,500,000 for Nuclear Waste Disposal. Funding in this control point is recommended to implement plans to consolidate spent nuclear fuel from around the United States to one or more private or government interim central storage facilities. Priority shall be given to accepting spent nuclear fuel from shutdown reactors, and to accelerating the development of a transportation capability to move spent fuel from its current storage locations. Within funds recommended, the Committee recommends up to \$10,000,000 for the Secretary, within existing authorities, to contract for the management of spent nuclear fuel to which the Secretary holds the title or has a contract to accept title, which includes contracting with a private company for consolidated interim storage of spent nuclear fuel.

REACTOR CONCEPTS RESEARCH, DEVELOPMENT, AND DEMONSTRATION

The Committee recommends \$197,000,000 for Reactor Concepts Research, Development, and Demonstration.

Advanced Small Modular Reactor Research, Development, and Demonstration.—The Committee recommends \$100,000,000 for ongoing work to support regulatory development, design, and deployment activities. Consistent with the budget request no funds are provided for the Joint Use Module Plant.

Advanced Reactor Concepts.—The Committee recommends \$20,000,000 to support current and previously awarded Advanced Reactor Concepts Industry agreements.

Microractor Siting and Workforce Development.—As DOE continues to support the research, development, demonstration, and deployment of microractor concepts, the Committee directs the De-

partment to submit a report to both the Committee within 90 days of enactment of this act outlining a strategy for siting a micro-reactor at an institution of higher education with existing infrastructure to support the reactor siting, perform fundamental research, test enabling technologies and cyber security solutions for grid integration, train the future workforce, and de-risk deployment for future private sector applications.

Light Water Reactor Sustainability.—The Committee recommends \$47,000,000 for Light Water Reactor Sustainability. The most cost-effective way for the United States to maintain low-cost, carbon-free electricity is to safely extend the lives of our Nation's existing nuclear reactors from 60 to 80 years. Therefore, the Committee recommends additional funding above the budget request for this activity as a priority.

ADVANCED REACTOR DEMONSTRATION PROGRAM

The Committee recommends \$280,000,000 for the Advanced Reactor Demonstration Program to demonstrate multiple advanced reactor designs.

The primary goal of this new program is to focus government and industry resources on actual construction of real demonstration reactors that are safe and affordable (to build and operate) in the near and mid-term. The Committee continues to believe that the only way the United States will regain its leadership in nuclear energy is to begin to deploy advanced reactors. In fiscal year 2020, Congress directed the Secretary to commence the Advanced Reactor Demonstration Program. Congress strongly supports the Department's intent to move quickly on the solicitation and award of these demonstration programs, consequently the Committee recommends \$280,000,000 for the Advanced Reactor Demonstration Program to ensure that the program can continue in an accelerated manner.

NUCLEAR ENERGY INFRASTRUCTURE

ORNL Nuclear Facilities Operations and Maintenance.—The Committee recommends \$28,000,000 for Oak Ridge National Laboratory [ORNL] Nuclear Facilities Operations and Maintenance for continued safe operations and maintenance of ORNL hot cells.

Construction.—The Committee recommends \$18,000,000 for the Sample Prep Laboratory, \$5,000,000 for the Advanced Nuclear Materials Laboratory to begin the design once CD-0 is approved, and \$45,000,000 for the Versatile Test Reactor [VTR] project. The Committee is concerned that the Department is proceeding with plans for the VTR without having secured commitments from private companies or foreign governments for monetary and in-kind contributions. Such a delay significantly undermines the likelihood of success. Therefore, the Committee directs the Department to submit a plan for executing the VTR project via a public-private partnership with an option for a payment-for-milestones approach. The plan shall be submitted to the Committee no later than 30 days after enactment of this act.

URANIUM RESERVE PROGRAM

Appropriations, 2020	
Budget estimate, 2021	\$150,000,000
Committee recommendation	120,000,000

The Committee recommends \$120,000,000 for the Uranium Reserve Program, a decrease of \$30,000,000 below the budget request. Because the Uranium Reserve Program involves multiple mission areas within the Department, the Committee has recommended an additional \$30,000,000 in funding for this activity within the Defense Nuclear Nonproliferation accounts. Not later than 30 days after the enactment of this act, the Department is directed to provide a specific program plan for executing funds recommended for this activity as well as plans to consolidate this program with other existing uranium management activities within the Department to create efficiencies.

FOSSIL ENERGY RESEARCH AND DEVELOPMENT

Appropriations, 2020	\$750,000,000
Budget estimate, 2021	730,601,000
Committee recommendation	750,000,000

The Committee recommends \$750,000,000 for Fossil Energy Research and Development, an increase of \$19,399,000 above the budget request. Within available funds, the Committee recommends \$61,500,000 for program direction.

Research and Development.—The Committee rejects the approach to only provide funds for early-stage research. Such restrictions would cripple innovation and development, and would reduce the number of energy technologies adopted in the marketplace.

The Committee recommends \$20,000,000 for the research and development of negative emissions technologies, including not less than \$10,000,000 for direct air capture.

National Carbon Capture Center.—The Committee recommends funding for the National Carbon Capture Center consistent with the cooperative agreement. The Committee continues to encourage the Department to establish university partnerships to support ongoing fossil energy programs, to promote broader research into carbon capture storage [CCS] technologies, and to expand its technology transfer efforts. The Department has previously funded several university-based CCS projects and is encouraged to build on an established research base to support ongoing research and to address the wider implementation of CCS technologies.

Industrial Decarbonization.—The Committee notes the lack of commercially viable carbon capture technology available for industrial manufacturers to significantly reduce emissions in a globally competitive manner. The Department was previously directed in the Energy and Water Development and Related Agencies Appropriations Act, 2020 (Public Law 116–94), to submit a report and provide a briefing to the Committees on Appropriations of both Houses of Congress not later than 180 days after enactment on the recommendations for program structures that could best support and maximize the impact of expanded research, development, and demonstration efforts in three areas: decarbonization of the industrial sector, direct air capture, and carbon use. The Committee

looks forward to the briefing and receipt of this report. Further, the Committee recommendation supports research and development on industrial decarbonization and catalyzing industry-government research partnerships, including carbon capture, utilization, and storage with an emphasis on reuse utilization within industry processes and materials; low-carbon fuels (e.g. hydrogen); transformative technology that will allow deep industrial decarbonization (including demonstration and deployment at scale); materials efficiency and circular economy; and carbon intensity definitions and labeling across key product groups.

COAL CARBON CAPTURE STORAGE AND POWER SYSTEMS

The Committee recommends \$478,600,000 for Coal Carbon Capture Storage and Power Systems.

The Department is directed to use funds from Coal Carbon Capture Storage and Power Systems for research and development that utilizes either coal or natural gas based generation of electricity.

The Committee supports funding for activities that promote the reuse of captured carbon dioxide from coal, natural gas, industrial facilities, direct air capture, and other sources for the production of fuels and other valuable products. The Committee further encourages the Department to establish and pursue a comprehensive carbon sequestration and utilization effort to combine research and development capacity and expertise to solve the carbon sequestration and utilization challenge within 10 years, with the goals of improving the economics associated with domestic energy production, achieving optionality in carbon management, and further reducing dioxide emissions.

The Committee supports the Department's existing cooperative agreements to develop cost-sharing partnerships to conduct basic, fundamental, and applied research that assist industry in developing, deploying, and commercializing efficient, low-carbon, nonpolluting energy technologies that could compete effectively in meeting requirements for clean fuels, chemical feedstocks, electricity, and water resources.

The Committee reiterates the importance of adequate Federal support to promote design-related work and testing for a commercial scale, post-combustion carbon dioxide capture project on an existing coal-fueled generating unit as well as research, development and deployment of breakthrough technologies, including co-firing with agricultural and forest residue biomass to achieve net greenhouse gas emissions reductions.

The Committee supports the integrated carbon and energy management activities of the Offices of Nuclear Energy, Fossil Energy, and Energy Efficiency and Renewable Energy and collaboration on high-efficiency electrochemical conversion of fossil resources to monomers and chemicals utilizing nuclear reactor thermal energy.

Carbon Capture.—Within available funds for Carbon Capture, the Committee recommends not less than \$8,000,000 for research and optimization of carbon capture technologies for use at industrial facilities, and not less than \$10,000,000 for carbon capture research for natural gas power systems.

Within available funds, the Committee recommends not less than \$15,000,000 for a new solicitation for Front-End Engineering and

Design [FEED] studies of commercial-scale carbon capture projects that generate carbon dioxide suitable for geologic storage, with at least two of these studies supporting projects at industrial facilities such as a steel or cement facility.

Carbon Storage.—Within available funds for Carbon Storage, the Committee recommends not less than \$21,000,000 for Carbon Use and Reuse to continue research and development activities to support valuable and innovative uses for carbon.

Within available funds, the Committee recommends \$55,000,000 for Storage Infrastructure. The Committee recognizes the successful work of the Regional Carbon Sequestration Partnerships [RCSPs] and the important role they play for carbon utilization and storage. The Committee supports the focus on infrastructure development strategies that develop regionally relevant business models for implementation. The Committee recognizes the importance of expanding regional geological characterization, collecting and analyzing data, and addressing regional monitoring, permitting, and policy challenges, and the value of this work in supporting broad-scale commercial deployment efforts. The Committee recommends not less than \$20,000,000 to expand and continue the work of the RCSPs selected under fiscal year 2019 appropriations. Further, the Committee recommends \$30,000,000 for CarbonSAFE and directs the Department to fully fund the CarbonSAFE projects selected in fiscal year 2020 and within remaining funds solicit proposals for additional CarbonSAFE projects.

The Department is encouraged to facilitate development and deployment of monitoring technologies at carbon capture utilization and storage projects with considerable progress towards commercial implementation (e.g. a Class VI permit, in-hand or pending). Currently available seismic data with respect to carbon storage can take several-to-many months for processing, and there are concerns about the ability to identify low levels of carbon dioxide concentrations in underground storage. Technologies that promise near real-time results, and/or employ big data, machine learning, and artificial intelligence are further encouraged to be given particular attention to better address issues such as leak detection, monetization of credits and permit compliance.

The Committee encourages a competitive solicitation to conduct tests of technologies for carbon dioxide absorption integrated with algae systems for capturing and re-using carbon dioxide to produce renewable materials, giving priority for teams with university participants.

Advanced Energy Systems.—The Committee recommends not less than \$23,000,000 and up to \$30,000,000 for solid oxide fuel cell [SOFC] systems for distributed and central power generation, electrolysis, SOFC combined heat and power, and storage applications. Recognizing the significant progress made in system integration and lifetime extension, this activity builds on the focus of research and development to enable efficient, cost-effective electricity generation with minimal use of water. This can exploit abundant domestic coal and natural gas resources with low or near-zero atmospheric emissions of carbon dioxide and other pollutants. SOFCs are also capable of running on sustainable biogas that can be sourced from agricultural and municipal waste, animal manure, sewage,

and more. Moreover, central power generation applications of SOFC can be integrated with carbon capture and storage efforts to contribute to a secure low carbon energy future. Combined heat and power systems can utilize SOFC waste heat and increase already high efficiencies. Electrolysis cells make hydrogen and oxygen from water and power and reversible electrolysis has developed as a platform for efficient bulk energy storage. This funding will preserve U.S. leadership in SOFC technology and will benefit the economy through retention of high-tech jobs and exports. To ensure timely development of this important technology, which is cost-shared with industry, where applicable, not less than 75 percent of the total shall be allocated to the SOFC industry teams.

The Committee recommends \$25,000,000 for the Advanced Turbine program, which supports the development of advanced, high-temperature materials including ceramic matrix composites.

The Committee recognizes the significant grid resilience benefits that distributed-scale highly-efficient natural gas engines can provide to the Nation's electricity grid. The Committee encourages the Office of Fossil Energy to jointly issue a competitive solicitation to industry with the Office of Electricity with the goal to develop highly efficient natural gas engines to be used in electricity generation. Further, preference is encouraged to be given to projects that prioritize fast demand response and improved integration with building and institution-based micro-grid systems.

The Committee recognizes there is support for coal and coal biomass to both liquids and solids activities and encourages the Department to consider research and development to improve cost and efficiency of coal-to-fuels technology implementation and polygeneration.

The Committee recommends \$30,000,000 for Advanced Coal Processing to support early-stage research and development to enable the conversion of coal pitch and coal to carbon fiber and other value-added products for alternative advanced uses of coal. The Committee recommends not less than \$10,000,000 for utilizing coal as precursor for high-value added products at the Carbon Fiber Technology Facility.

Crosscutting Research.—Within available funds, the Committee recommends \$1,500,000 to accelerate development and deployment of wireless sensor systems for coal-fired power generation in order to improve generating efficiency, reduce emissions, and lower maintenance costs.

The Committee recommends \$16,000,000 for Advanced Ultra Supercritical Materials Research and Development to identify, test, qualify, and develop a domestic supply chain capable of producing components from high temperature steam materials.

National Energy Technology Laboratory [NETL] Coal Research and Development.—Within available funds, the Committee recommends not less than \$23,000,000 for the Department to continue its external agency activities to develop and test advanced separation technologies and accelerate the advancement of commercially viable technologies for the recovery of rare earth elements and minerals from U.S. coal and coal byproduct sources. The Committee expects research to support pilot-scale and experimental activities for near-term applications, which encompass the extraction and recov-

ery of rare earth elements and minerals from conditionally-favorable U.S. coal and coal byproduct sources.

The Committee remains concerned that the United States continues to import all of its rare earth elements need from overseas and believes that finding near-term and future domestic sources is a top national security priority. Lignite coal can produce all 16 rare earth elements, as well as critical minerals such as germanium, and research has shown that most of the elements accumulate in top and bottom of the coal seam. The Committee encourages the Department to continue investments to accelerate the advancement of commercially viable technologies for the recovery of rare earth elements and critical minerals from lignite and expects the Department to fund a more detailed assessment of lignite resources and to devise cost-effective methods of removing rare earths from lignite.

NATURAL GAS TECHNOLOGIES

The Committee recommends \$55,000,000 for Natural Gas Technologies.

The Department was previously directed in the Energy and Water Development and Related Agencies Appropriations Act, 2019 (Public Law 155–244), to submit a report to the Committees on Appropriations of both Houses of Congress not later than 18 months after the date of enactment a study on the potential for natural gas demand response across energy sectors geographic regions. The Committee expects this report to be provided expeditiously.

The Committee encourages the department to work with regional universities to evaluate ways to create or add value to natural gas liquids in the Bakken and potential for use in the region.

Methane Hydrate Activities.—The Committee recommends \$25,000,000 for methane hydrates. The Committee encourages the Department to perform a long-term methane hydrate production test in the Arctic, as proposed in the Methane Hydrate Advisory Committee’s earlier recommendations (May 21, 2014) to the Department. Further, the Committee supports field investigations in the Gulf of Mexico to confirm the nature, regional context, and hydrocarbon system behavior of gas hydrate deposits and recommends \$5,000,000 for these activities.

Environmentally Prudent Development.—The Committee recommends \$12,000,000 for the Environmentally Prudent Development subprogram, including not less than \$5,200,000 to continue the Risk Based Data Management System [RBDMS]. The Committee supports continued funding of RBDMS and in particular, its functions under FracFocus. The Committee believes FracFocus should maintain its autonomy and not be incorporated into any Federal agency.

Emissions Mitigation from Midstream Infrastructure.—The Committee recommends \$12,000,000 for the Emissions Mitigation from Midstream Infrastructure subprogram. The Committee recommends funds to support natural gas infrastructure research, including advanced materials and novel sensor technologies.

Emissions Quantification from Natural Gas Infrastructure.—The Committee recommends \$6,000,000 for the Emissions Quantification from Natural Gas Infrastructure research subprogram.

UNCONVENTIONAL FOSSIL ENERGY TECHNOLOGIES

The Committee recommends \$46,000,000 for Unconventional Fossil Energy Technologies.

The Committee notes the importance of providing research support that will assure sustainable, reliable, affordable, and environmentally sound supplies of domestic unconventional fossil energy resources.

Within available funds, the Committee recommends \$20,000,000 for research that develops improved enhanced recovery technologies. These technologies are essential to maximizing the value of shale oil, low permeability reservoirs, residual oil zone reservoirs, fractured reservoirs, and conventional oil reservoirs, and should advance technologies related to wellbore integrity, artificial lift, well production operations, and applicability with data analytics. In continuing with prior direction, the Department shall ensure these funds are awarded to universities and not-for-profit research organizations.

The Committee previously directed the Department in the Energy and Water Development and Related Agencies Appropriations Act, 2020 (Public Law 116–94), to provide a report to the Committees on Appropriations of both houses of Congress that outlines the Department’s efforts to maintain a stable petroleum engineering workforce and knowledge base, as well as future activities the Department can undertake to strengthen it. The Committee looks forward to receipt of the report.

The Department is encouraged to explore research and development for safe drilling and completion technologies that use no fresh water and can be deployed in horizontal wells.

The Committee recommends not less than \$19,000,000 for the Unconventional Field Test Sites. The Committee supports leveraging these field test sites to test methods for improving recoveries from the growing inventory of existing wells, via well stimulation and/or enhanced recovery techniques that will lessen the need for large numbers of new wells to meet supply demands. Continued research focused on produced water management and beneficial re-use, and methane emissions (particularly flaring) capture and beneficial re-use, are also needed.

The Committee recommends not less than \$4,000,000 for further research on multipronged approaches for characterizing the constituents of and managing the cleaning of water produced during the extraction of oil and natural gas, of which not less \$2,000,000 is recommended to partner with research universities engaged in the study of characterizing, cleaning, treating, and managing produced water and who are willing to engage through public private partnerships with the energy industry to develop and assess commercially viable technology to achieve the same. The Committee encourages the Department to work with the energy producing industry to identify and develop commercial-scale technologies that can characterize, clean and effectively treat produced water to have beneficial reuse.

NATIONAL ENERGY TECHNOLOGY LABORATORY

No funds may be used to plan, develop, implement, or pursue the consolidation or closure of any NETL sites.

The Committee recommends \$50,000,000 for NETL Research and Operations and \$58,000,000 for NETL Infrastructure. Further, within NETL Infrastructure, the Department is directed to prioritize funds for Joule, the Computational Science and Engineering Center, the Center for Artificial Intelligence and Machine Learning, site-wide upgrades for safety, and addressing and avoiding deferred maintenance.

NAVAL PETROLEUM AND OIL SHALE RESERVES

Appropriations, 2020	\$14,000,000
Budget estimate, 2021	13,006,000
Committee recommendation	13,006,000

The Committee recommends \$13,006,000 for Naval Petroleum and Oil Shale Reserves, the same as the budget request.

STRATEGIC PETROLEUM RESERVE

Appropriations, 2020	\$195,000,000
Budget estimate, 2021	187,081,000
Committee recommendation	187,081,000

The Committee recommends \$187,081,000 for the Strategic Petroleum Reserve, the same as the budget request.

SPR PETROLEUM ACCOUNT

Appropriations, 2020	\$10,000,000
Budget estimate, 2021	-68,000,000
Committee recommendation	1,000,000

The Committee recommends \$1,000,000 for the SPR Petroleum Account, an increase of \$69,000,000 above the budget request.

NORTHEAST HOME HEATING OIL RESERVE

Appropriations, 2020	\$10,000,000
Budget estimate, 2021	-84,000,000
Committee recommendation	10,000,000

The Committee recommends \$94,000,000 for the Northeast Home Heating Oil Reserve, an increase of \$10,000,000 above the budget request.

ENERGY INFORMATION ADMINISTRATION

Appropriations, 2020	\$126,800,000
Budget estimate, 2021	128,710,000
Committee recommendation	126,800,000

The Committee recommends \$126,800,000 for the Energy Information Administration [EIA], a decrease of \$1,910,000 from the budget request.

The Committee recognizes the importance of building energy information and the opportunity for better data collection presented by new technologies. The Department is encouraged to upgrade the Commercial Buildings Energy Consumption Surveys to a real-time

data collection system with rapid reporting of results, without compromising statistical validity or data security.

The Committee directs EIA to provide a report to the Committees on Appropriations of Houses of Congress not later than 180 days after enactment of this act outlining resources necessary to further develop National Energy Modeling System capabilities to be able to simulate deep decarbonization scenarios, including economy-wide net-zero emissions policies.

Within available funds, the Committee directs the Department to evaluate including requirements within agreements with state energy offices and state regulatory agencies to gather data on the delivered generation resource mix and emissions rates for every load-serving entity as defined in 16 U.S.C. §824q(2). The Department is directed to provide to the Committee not later than 90 days after enactment of this act an evaluation to include estimated cost, schedule, and overall feasibility of collecting and analyzing the data described above on an annual basis.

NON-DEFENSE ENVIRONMENTAL CLEANUP

Appropriations, 2020	\$319,200,000
Budget estimate, 2021	275,820,000
Committee recommendation	326,000,000

The Committee recommends \$326,000,000 for Non-Defense Environmental Cleanup, an increase of \$50,180,000 above the budget request.

Small Sites.—The Committee recommends \$119,833,000 for Small Sites. Within the available funds, the Committee recommends \$22,000,000 to continue work at Lawrence Berkeley National Laboratory, \$19,000,000 for Energy Technology Engineering Center, \$47,833,000 for Moab, \$10,000,000 for excess Office of Science facilities, and \$10,000,000 to continue work required pursuant to the agreement reached in 2012 between the Department, the Advisory Council on Historic Preservation, and State and local governments to complete the demolition of K-25 in exchange for preserving the historic contributions made by the K-25 site to the Manhattan Project.

URANIUM ENRICHMENT DECONTAMINATION AND DECOMMISSIONING FUND

Appropriations, 2020	\$881,000,000
Budget estimate, 2021	806,244,000
Committee recommendation	848,000,000

The Committee recommends \$848,000,000 for Uranium Enrichment Decontamination and Decommissioning [UED&D] activities, an increase of \$41,756,000 above the budget request.

The Committee recommendation includes \$134,701,000 for East Tennessee Technology Park to continue cleanup and demolition of all remaining facilities including the K-1200 complex and the K-1600 complex, and to conduct remedial actions, and site closure activities. The Committee also recommends \$240,000,000 for Paducah, and \$430,332,000 for Portsmouth. The Department shall not barter, transfer, or sell uranium during fiscal year 2021 to generate additional funding for Portsmouth cleanup that is in excess of the

amount of funding recommended. Within funds available for Pensions and Community and Regulatory Support, the Committee recommends an additional \$10,000,000 above the budget request to ensure contractor pensions are adequately funded.

SCIENCE

Appropriations, 2020	\$7,000,000,000
Budget estimate, 2021	5,837,806,000
Committee recommendation	7,026,000,000

The Committee recommends \$7,026,000,000 for Science, an increase of \$1,188,194,000 above the budget request. The recommendation includes \$188,000,000 for program direction.

Distinguished Scientist Program.—The Committee recommends \$4,000,000 to support the Department’s Distinguished Scientist Program, as authorized in section 5011 of Public Law 110–69, to promote scientific and academic excellence through collaborations between institutions of higher education and national laboratories to be funded from across all Office of Science programs.

Quantum Information Science.—The Committee supports the Office of Science’s coordinated and focused research program in quantum information science to support the Department’s science, energy, and national security missions, as authorized in sections 401 and 402 of Public Law 115–368, the National Quantum Initiative. This Industry of the Future promises to yield revolutionary new approaches to computing, sensing, communication, data security, and metrology, as well as our understanding of the universe, and accordingly, the Committee recommends \$270,541,000 from across the Office of Science programs to advance early-stage fundamental research in this field of science, including activities authorized in section 401 and the continuation of up to five National Quantum Information Science Research Centers authorized in section 402. To the greatest extent practical, this effort shall be undertaken in coordination with the National Science Foundation and the National Institute of Standards and Technology. Further, the Department is directed to collaborate with private sector stakeholders, the user community and interagency partners, to develop a roadmap to provide researchers access to quantum systems so as to enhance the U.S. quantum research enterprise, stimulate the fledgling U.S. quantum computing industry, educate the future quantum computing workforce, and accelerate advancement of quantum computer capabilities. The Department is directed to brief the Committee within 90 days of the enactment of this act on such a roadmap.

Artificial Intelligence and Machine Learning.—The Committee recommends not less than \$120,000,000 for Artificial Intelligence and Machine Learning across the Office of Science Programs. As the stewards of the leadership computing facilities, the Committee expects Advanced Scientific Computing Research to take a lead role in the Department’s artificial intelligence and machine learning activities. The Committee appreciates the Department’s focus on the development of foundational artificial intelligence and machine learning capabilities, and directs the Office of Science to apply those capabilities to the Office of Science’s mission with a focus on

accelerating scientific discovery in its Scientific User Facilities and large experiments.

Office of Science Carbon Dioxide Removal.—The Committee recommends not less than \$20,000,000 in Basic Energy Sciences and Biological and Environmental Research for research and development of negative emissions technologies, including not less than \$5,000,000 for direct air capture. The Office of Science is directed to continue to collaborate with the Office of Fossil Energy and the Office of Energy Efficiency and Renewable Energy to support research, development, and demonstration projects to advance the development and commercialization of carbon removal technologies on a significant scale.

Collaborative Research.—Collaborative research efforts between the Department and the National Institutes of Health [NIH] are developing breakthroughs in health research, including drug discovery, brain research, diagnostic technologies, imaging, and other biomedical research areas. The Department is encouraged to expand its relationships with NIH in order to work together more strategically to leverage the Department's Scientific User Facilities and research capabilities, including instrumentation, materials, modeling and simulation, and data science.

ADVANCED SCIENTIFIC COMPUTING RESEARCH

The Committee recommends \$1,029,000,000 for Advanced Scientific Computing Research [ASCR].

The Committee strongly supports ASCR's leadership in emerging areas relevant to the Department's mission, including artificial intelligence and quantum information science. The Committee commends ASCR's pursuit of machine learning tools for scientific applications and its support for the development of algorithms for future deployable quantum computers. The Committee recognizes that a robust research program in applied and computational mathematics and computer science will be critical to continued progress in these areas and is supportive of the Department's efforts to prioritize these programs.

The Committee recommends \$168,945,000 for the Exascale Computing Project. In addition, the Committee recommends \$230,000,000 for the Oak Ridge Leadership Computing Facility, \$155,000,000 for the Argonne Leadership Computing Facility, \$110,000,000 for the National Energy Research Scientific Computing Center, and \$90,000,000 for ESnet.

Maintaining international leadership in high performance computing requires a long term and sustained commitment to basic research in computing and computational sciences, including applied math, software development, networking science, and computing competency among scientific fields. The Committee recommends \$254,977,000 for Mathematical, Computational, and Computer Sciences Research. Further, the Committee recommends not less than \$10,000,000 for the Computational Sciences Graduate Fellowship.

BASIC ENERGY SCIENCES

The Committee recommends \$2,215,000,000 for Basic Energy Sciences [BES].

The Committee continues to support the EPSCoR program and its goals of broadening participation in sustainable and competitive basic energy research in eligible jurisdictions. The Committee recommends \$25,000,000 for EPSCoR and directs the Department to continue annual or at minimum, biennial implementation grant solicitations.

The Committee recommends \$525,000,000 to provide for operations at the five BES light sources and \$292,000,000 for the high-flux neutron sources. The Committee recommends not less than \$115,000,000 for the Energy Frontier Research Centers to continue multi-disciplinary, fundamental research needed to address scientific grand challenges. The Committee recommends not less than \$139,000,000 for operations at the five BES Nanoscale Science Research Centers and to adequately invest in the recapitalization of key instruments and infrastructure, and in staff and other resources necessary to deliver critical scientific capabilities to users. The Committee recognizes that leveraging advances in artificial intelligence for chemistry and materials science presents a unique opportunity to accelerate discovery and innovation. The Department is encouraged to explore opportunities to develop an autonomous chemistry and materials synthesis platform as part of the Nanoscale Science Research Centers. The capabilities will leverage advances in artificial intelligence to enable greater efficiencies and scientific throughput, leading to significant reduction of the total time and cost in novel materials discovery and innovation.

The Committee recommends \$24,088,000 for the Batteries and Energy Storage Hub, the Joint Center for Energy Storage Research [JCESR], and \$20,000,000 for the Fuels from Sunlight Hub.

The Committee encourages the Department to continue funding to support research and development needs of graduate and post-graduate science programs at Historically Black Colleges and Universities.

The Committee recommends \$26,000,000 for exascale systems.

Not less than \$19,000,000 is recommended for Other Project Costs, of which \$2,000,000 is for the High Energy Upgrade at LCLS-II; \$13,000,000 is for the Second Target Station; \$3,000,000 is for the Proton Power Upgrade project at the Spallation Neutron Source; and \$1,000,000 is for the Cryomodule Repair and Maintenance Facility. The Committee recommends \$5,000,000 for the NSRC Recapitalization Project. Further, the Committee recommends not less than \$5,500,000 for the NSLS II Experimental Tools II Major Item of Equipment [MIE]. The Department is directed to continue supporting the construction of additional beamlines in future budget requests so the Nation's scientists can more fully leverage the investment that has been made in the NSLS II while it is the most powerful X-Ray light source in the nation.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

The Committee recommends \$750,000,000 for Biological and Environmental Research.

The Department is directed to give priority to optimizing the operation of Biological and Environmental Research User Facilities.

The Committee directs the Department to enhance investments in machine learning to advance the use of diverse and increasingly autonomous datasets to understand environmental and climate dynamics; rapidly incorporate datasets into predictive watershed, ecosystem and climate models; and project the onset of and track extreme events, such as atmospheric rivers and hurricanes.

The Committee recommends not less than \$100,000,000 for the four Bioenergy Research Centers. The Committee directs the Department to maintain Genomic Science as a top priority and recommends not less than \$109,000,000 for Foundational Genomics Research. Further, the Committee recommends not less than \$45,000,000 for Biomolecular Characterization and Imaging Science, including \$15,000,000 to continue the development of a multi-scale genes-to ecosystems approach that supports a predictive understanding of gene functions and how they scale with complex biological and environmental systems. The Committee recommends \$85,000,000 for the Joint Genome Institute, an essential component for genomic research. The Committee supports the Department's establishment of a national microbiome database collaborative.

The Committee recommends not less than \$78,000,000 for Environmental System Science. Within available funds for Earth and Environmental Systems Sciences, the Committee recommends not less than \$10,000,000 is for Next Generation Ecosystem Experiments Arctic; \$8,300,000 is for the Spruce and Peatland Responses Under Changing Environments field site; \$5,000,000 is to initiate planning and pilot studies for new Terrestrial Ecosystem Science manipulation experiments; \$7,000,000 for Next Generation Ecosystem Experiments Tropics; and \$5,100,000 for AmeriFLUX Long-Term Earth System Observations. Further, within available funding the Committee recommends not less than \$3,500,000 to support ongoing research and discovery related to mercury biogeochemical transformations in the environment and \$6,800,000 for Watershed Function Science Focus Area.

The Committee supports the Department's efforts to advance understanding of coastal ecosystems, as initiated with the terrestrial-aquatic interfaces pilot in fiscal year 2019, and recommends \$30,000,000 to build upon the current modeling-focused effort and to develop observational assets and associated research to study the nation's major land-water interfaces, including the Great Lakes, by leveraging national laboratories' assets as well as local infrastructure and expertise at universities and other research institutions. The Committee encourages the Department to continue to support the River Corridor Science Focus Area.

Due to the importance of snowmelt-dominated mountainous systems to Western U.S. water resources, the Committee encourages the Department to develop an integrated mountainous hydrology focus, which extends observations and models and leverages collaborations supported by other Federal agencies.

The Committee recommends up to \$6,000,000 to advance biological and environmental capabilities through the development and prototyping of fabricated ecosystems and sensors that enable interrogation of biological-environmental interactions across molecular to ecosystem-relevant scales under controlled laboratory conditions.

The Committee recommends \$15,000,000 to support the exascale computing initiative. The Committee encourages the Department to enhance investments in machine learning as needed to improve prediction of watershed and ecosystem dynamics using diverse and distributed databases.

The Committee encourages the Department to increase its funding for academia to perform independent evaluations of climate models using existing data sets and peer-reviewed publications of climate-scale processes to determine various models' ability to reproduce the actual climate.

The Committee is aware that reducing uncertainty in understanding cloud aerosol effects requires investment in observational studies, modeling, and computing. The Committee recommends \$15,000,000 for cloud-aerosol research and computing.

FUSION ENERGY SCIENCES

The Committee recommends \$640,000,000 for Fusion Energy Sciences.

U.S. Contribution to the International Thermonuclear Experimental Reactor [ITER] Project.—The Committee recommends \$211,000,000 for the U.S. contribution to the ITER Project, of which not less than \$54,000,000 is for in-cash contributions.

Operations, Research, and Development.—The Department is encouraged to support optimal facility operations levels for DIII-D. The Committee recommends \$25,000,000 for the Material Plasma Exposure eXperiment.

The Committee is aware of the increase in global investment in private fusion energy companies developing advanced technology approaches with a focus on commercialization. The U.S. has an opportunity to seize global leadership in this transformational energy sector and attract global industry stakeholders by building on the Department's laboratory capabilities and world class fusion science talent while partnering with these private fusion companies. The Committee supports the Department's Innovation Network for Fusion Energy [INFUSE] research and development program that is advancing enabling fusion energy commercialization technologies through partnerships with industry, labs and universities, and recommends \$4,000,000 for the continuation of the INFUSE program.

Further, the Committee previously directed the Fusion Energy Sciences Advisory Committee to give full consideration to the establishment of a cost-share program for reactor technologies as part of the ongoing long-range strategic planning activity. The Committee looks forward to receipt of the long-range strategic plan from the Fusion Energy Sciences Advisory Committee.

The Committee recommends not less than \$20,000,000 for the High-Energy-Density Laboratory Plasmas program to support initiatives in quantum information science, advance cutting-edge research in extreme states of matter, expand the capabilities of the LaserNetUS facilities, and provide initial investments in new intense, ultrafast laser technologies needed to retain U.S. leadership in these fields. To maintain U.S. leadership in intense, ultrafast lasers, the Committee directs the Department, within 180 days of enactment of this act, to submit a report to the Committees on Appropriations of Houses of Congress, describing the Department's plans

to respond to the recommendations of the Brightest Light Initiative Workshop Report, including facility investments and improvements needed to advance laser science technology and applications.

HIGH ENERGY PHYSICS

The Committee recommends \$1,050,000,000 for High Energy Physics.

Within Major Items of Equipment [MIE], and Other Project Costs, the Committee recommends \$30,000,000 for the Sanford Underground Research Facility; \$99,000,000 for the HL-LHC Upgrade projects; \$16,000,000 for the Facility for Advanced Accelerator Experimental Tests-II; and \$2,000,000 for the Cosmic Microwave Background-Stage 4 MIE; \$12,000,000 for the Dark Energy Spectroscopy Instrument; and \$6,000,000 for Lux Zeplin.

The Committee recommends not less than \$18,500,000 for Vera C. Rubin Observatory operations. The Committee acknowledges the longstanding planning and contributions of resources by partner organizations with respect to data management on the Vera C. Rubin Observatory. The Committee directs the Department to employ the computational expertise and existing capabilities in data management of those organizations-potentially in partnership with the national laboratories-to ensure the successful operation of this project and access for the broad research community. The Department is directed to provide a briefing to the Committee on the status of the project, including plans for management of the data facility, within 30 days of enactment of this act.

NUCLEAR PHYSICS

The Committee recommends \$725,000,000 for Nuclear Physics.

The Committee recommends optimal operations for all Nuclear Physics user facilities.

Within Major Items of Equipment and Other Project Costs, the Committee recommends \$6,600,000 for the Gamma-Ray Energy Tracking Array; \$5,530,000 for sPHENIX; \$5,000,000 for MOLLER; \$1,400,000 for Ton-Scale Neutrino-less Double Beta Decay; \$17,000,000 for the Electron Ion Collider; and \$1,000,000 for the High Rigidity Spectrometer; and \$3,000,000 for the U.S. Stable Isotope Production and Research Center.

Within available funds, not less than \$1,000,000 is recommended to establish a traineeship program for students to develop the future workforce of radioisotope production. Further, the Department is directed to provide, within 180 days of enactment of this act, a plan to develop a consortium of research universities to apply advanced manufacturing techniques to radioisotope production, including automation, digitalization, artificial intelligence, fabrication, and state-of-the-art characterization instrumentation.

WORKFORCE DEVELOPMENT FOR TEACHERS AND SCIENTISTS

The Committee recommends \$28,500,000 for Workforce Development for Teachers and Scientists. Within available funds, the Committee recommends \$13,600,000 for Science Undergraduate Laboratory Internships; \$1,700,000 for Community College Internships; \$4,500,000 for the Graduate Student Research Program; \$1,800,000

for the Visiting Faculty Program; \$1,200,000 for the Albert Einstein Distinguished Educator Fellowship; \$2,900,000 for the National Science Bowl; \$700,000 for Technology Development and Online Application; \$600,000 for Evaluation Studies; and \$1,500,000 for Outreach.

Within Outreach, the Committee directs the Department to establish a working group comprised of the Office of Science and national laboratories and a consortium of universities to assist universities in the development of a curriculum to promote the next generation of scientists utilizing artificial intelligence, quantum information science, and machine learning. The Committee directs the Department to provide a report and briefing to the Committee within 180 days of enactment of this act on a plan to meet universities educational curriculum needs to support this future scientific workforce.

Further, the Department was previously directed in the Energy and Water Development and Related Agencies Appropriations Act (Public Law 116-94), 2020, to provide a report to the Committees on Appropriations of both Houses of Congress on the how the Office of Science plans to comply with Executive Order 13853 to develop a pipeline to meet future needs in trade craft requirements and workforce development in coordination with the national laboratories not later than 60 days after enactment. The Committee has not received the report and looks forward to receiving it expeditiously.

SCIENCE LABORATORIES INFRASTRUCTURE

The Committee recommends \$279,500,000 for Science Laboratories Infrastructure.

Within these funds, the Committee recommends \$26,000,000 for nuclear operations at Oak Ridge National Laboratory. In future budget requests, the Committee directs the Office of Science to work with the Office of Nuclear Energy to demonstrate a commitment to operations and maintenance of nuclear facilities at Oak Ridge National Laboratory that supports multiple critical missions.

ADVANCED RESEARCH PROJECTS AGENCY-ENERGY

Appropriations, 2020	\$425,000,000
Budget estimate, 2021	- 310,744,000
Committee recommendation	430,000,000

The Committee recommends \$430,000,000 for the Advanced Research Projects Agency-Energy [ARPA-E], an increase of \$740,744,000 above the budget request. Within available funds, the Committee recommends \$35,000,000 for program direction.

The Committee continues to definitively reject the short-sighted proposal to terminate ARPA-E, and instead increases investment in this transformational program and directs the Department to continue to spend funds provided on research and development and program direction. The Department shall not use any appropriated funds to plan, develop, implement, or pursue the termination of ARPA-E. Further, the Department is directed to disburse funds appropriated for ARPA-E on eligible projects within a reasonable time period, consistent with past practices.

INNOVATIVE TECHNOLOGY LOAN GUARANTEE PROGRAM

ADMINISTRATIVE EXPENSES

GROSS APPROPRIATION

Appropriations, 2020	32,000,000
Budget estimate, 2021	-381,659,000
Committee recommendation	32,000,000

OFFSETTING COLLECTIONS

Appropriations, 2020	-\$3,000,000
Budget estimate, 2021	-3,000,000
Committee recommendation	-3,000,000

NET APPROPRIATION

Appropriations, 2020	\$29,000,000
Budget estimate, 2021	-384,659,000
Committee recommendation	29,000,000

The Committee recommends \$32,000,000 in funding for the Innovative Technology Loan Guarantee Program, an increase of \$413,659,000 above the budget request. This funding is offset by \$3,000,000 in collections from loan guarantee applicants, for a net appropriation of \$29,000,000. An additional \$49,000,000 is credited to the bill as an adjustment from negative subsidies associated with this program. No funds recommended under this heading may be used to plan, develop, implement or pursue the elimination of the Title XVII Innovative Technologies Loan Program.

ADVANCED TECHNOLOGY VEHICLES MANUFACTURING LOAN PROGRAM

Appropriations, 2020	\$5,000,000
Budget estimate, 2021 .....	.....
Committee recommendation	5,000,000

The Committee recommends \$5,000,000 for the Advanced Technology Vehicles Manufacturing Loan Program, an increase of \$5,000,000 above the budget request.

TRIBAL ENERGY LOAN GUARANTEE PROGRAM

Appropriations, 2020	\$2,000,000
Budget estimate, 2021	-8,500,000
Committee recommendation	2,000,000

The Committee recommends \$2,000,000 for the Tribal Energy Loan Guarantee Program, an increase of \$10,500,000 above the budget request.

OFFICE OF INDIAN ENERGY POLICY AND PROGRAMS

Appropriations, 2020	\$22,000,000
Budget estimate, 2021	8,005,000
Committee recommendation	22,000,000

The Committee recommends \$22,000,000 for the Office of Indian Energy Policy and Programs, an increase of \$13,995,000 above the budget request.

The Committee supports the efforts to utilize local subject matter experts to assist Indian Tribes and Alaska Native villages in developing energy projects and providing support for energy planning. The Committee continues to direct the Office of Indian Energy to design funding opportunity announcements that do not exclude Tribes based on land ownership structures.

DEPARTMENTAL ADMINISTRATION

(GROSS)

Appropriations, 2020	\$254,378,000
Budget estimate, 2021	229,472,000
Committee recommendation	254,378,000

(MISCELLANEOUS REVENUES)

Appropriations, 2020	–\$93,378,000
Budget estimate, 2021	–93,378,000
Committee recommendation	–93,378,000

NET APPROPRIATION

Appropriations, 2020	\$161,000,000
Budget estimate, 2021	136,094,000
Committee recommendation	161,000,000

The Committee recommends \$254,378,000 in funding for Departmental Administration. This funding is offset by \$93,378,000 in revenue for a net appropriation of \$161,000,000.

The Committee continues to use a reduced number of control points in this account to provide flexibility to the Department in its management and funding of its support functions. The Department is directed to continue to submit its budget request for this account in its current structure. The Other Departmental Administration activity includes the Office of Technology Transitions, Management, Project Management Oversight and Assessments, Chief Human Capital Officer, Office of Small & Disadvantaged Business Utilization, General Counsel, Office of Policy, and Public Affairs. Within available funds, the Committee recommends \$35,000,000 for the Office of General Counsel and \$7,000,000 for the Office of Policy.

The Energy and Water Development and Related Agencies Appropriations Act, 2020 (Public Law 116-94), directed a report on the value of creating a nonprofit foundation. The Committee looks forward to receiving the report upon completion.

International Affairs.—Within available funds, the Committee recommends \$2,000,000 for the Israel Binational Industrial Research and Development [BIRD] Foundation and \$4,000,000 to continue the U.S. Israel Center of Excellence in Energy Engineering and Water Technology.

Technology Transfer.—Within the amount recommended for Other Departmental Administration, the Committee recommends \$14,080,000 for the Office of Technology Transition.

Chief Information Officer [CIO].—The Committee recommends \$140,200,000 for Department-wide information technology and cybersecurity efforts. The Committee continues to support the Department's efforts to modernize its internal and external digital

services consistent with the requirements of the 21st Century IDEA (Public Law 115–336). The Committee believes the 21st Century IDEA will enable the CIO to improve digital service delivery for citizens and internal workflows. Therefore, within funds provided, the Committee recommends \$2,000,000 to implement and sustain those 21st Century IDEA requirements that have the most significant impact on mission enhancement and that most effectively modernize citizen-facing services; specifically, the Committee encourages the Department to modernize and secure its forms and accelerate the use of electronic signatures to achieve cost savings and workflow efficiencies.

The Department is directed to continue to expand and drive Department-wide implementation, including the National Nuclear Security Administration, of the CIO Business Operations Support Services [CBOSS] program to maximize, consolidate, and fully meet the multiple mission requirements as well as support the Department’s business transformation and critical cybersecurity mission. CBOSS funding resources shall continue to be prioritized to ensure that the CIO continues to work closely with the Offices of Electricity and Cybersecurity, Energy Security, and Emergency Response to ensure coordinated protection of the Power Marketing Administrations and unified support for cybersecurity of the energy sector, as well as initiatives for information technology and data center optimization, movement to the cloud and enhancing the stewardship of information technology spending including progress in implementing technology business management, incorporating new controls on information technology spend capture in financial systems in cooperation with the Office of the Chief Financial Officer, and expanding the use of category management and best in class contract vehicles.

U.S. Energy Employment Report.—Within available funds for the Office of Policy, the Committee recommends \$1,700,000 to complete a U.S. energy employment report that includes a comprehensive statistical survey to collect data, publish the data and provide a summary report. The information collected shall include data related to employment figures and demographics in the U.S. energy sector using methodology approved by the Office of Management and Budget in 2016. The Department is directed to produce and release this report annually.

OFFICE OF THE INSPECTOR GENERAL

Appropriations, 2020	\$54,215,000
Budget estimate, 2021	57,739,000
Committee recommendation	57,739,000

The Committee recommends \$57,739,000 for the Office of the Inspector General, the same as the request.

ATOMIC ENERGY DEFENSE ACTIVITIES

NATIONAL NUCLEAR SECURITY ADMINISTRATION

The Committee recommendation for the National Nuclear Security Administration [NNSA] continues funding for recapitalization of our nuclear weapons infrastructure, while modernizing and maintaining a safe, secure, and credible nuclear deterrent without

the need for underground testing. This is among our most important national security priorities.

At the same time, the Committee supports continuing important efforts to secure and permanently eliminate remaining stockpiles of nuclear and radiological materials overseas and in the United States that could be used for nuclear or radiological weapons. In addition, the Committee supports Naval Reactors and the important role they play in enabling the Navy's nuclear fleet.

The NNSA is a semi-autonomous agency within the Department, and it is important to preserve that autonomy. The NNSA Act clearly lays out the functions of the NNSA, and gives the Administrator authority over, and responsibility for, those functions. Again this year, no funds shall be used to reorganize, reclassify, or study combining any of those functions with the Department. Further, the Committee strongly encourages better coordination between the NNSA and the Department of Defense during its budget formulation process.

A highly skilled and diverse workforce is required to maintain and modernize the nuclear weapons stockpile and execute the global nonproliferation initiatives of the NNSA. The Committee commends the NNSA for its continued efforts to recruit and retain this unique workforce.

INTEGRATED UNIVERSITY PROGRAM

The Committee directs the Secretary to carry out the requirements of the Integrated University Program in support of university research and development in areas relevant to the NNSA's mission. Within available funds, the Committee recommends not less than \$5,000,000 for the Integrated University Program to cultivate the next generation of leaders in nonproliferation, nuclear security, and international security. Together with funds from the Office of Nuclear Energy and the Nuclear Regulatory Commission, this program ensures highly qualified nuclear specialists will be available to meet national needs. The Committee directs the Department to request funding for this program in future budget years. Funding for this program shall not come from prior year funds.

In addition to the Integrated University Program within Defense Nuclear Nonproliferation, the NNSA manages several university-related programs, ranging from fellowships and scholarships to university research. The NNSA is directed to provide a report annually with the budget request that lists all of the university programs requested, the recommended funding level, and the value that program provides the NNSA.

PROJECT MANAGEMENT

The Committee is concerned about the NNSA's ability to properly estimate costs and timelines for large projects. The NNSA is encouraged to assess current performance on projects costing more than \$750,000,000, and make appropriate project management changes. The Committee encourages the NNSA to identify problems in cost and schedule estimates early, and provide updated information to the Committee in a timely manner.

WEAPONS ACTIVITIES

Appropriations, 2020	\$12,457,097,000
Budget estimate, 2021	15,602,000,000
Committee recommendation	15,602,000,000

The Committee recommends \$15,602,000,000 for Weapons Activities, the same as the budget request, to ensure the safety, security, reliability, and effectiveness of the Nation's nuclear weapons stockpile without the need for nuclear testing.

STOCKPILE MANAGEMENT

The Committee recommends \$4,290,244,000 for Stockpile Management.

Stockpile Major Modernization.—The Committee recommends \$4,290,244,000 for Stockpile Major Modernization, including \$2,666,946,000 for Life Extension Programs [LEPs] and Major Alterations. All LEPs and major alterations in the budget request are fully funded, consistent with the plan of record approved by the Nuclear Weapons Council.

The Committee supports the initial studies to evaluate the W93 warhead, which will be important to help maintain critical workforce skills, support our partnership on nuclear deterrence with the U.K., and ensure a technical hedge for the submarine portion of our deterrent. At the same time, the W93 program provides a unique opportunity to influence the way we manage the stockpile in the future. The schedule for the LEPs currently underway is largely driven by obsolescence and the material condition of the warheads, which has created a bow wave with little flexibility. NNSA is encouraged to consider overall lifecycle costs and sustainment requirements for the warhead upfront, and is directed to brief the Committee quarterly on these efforts. The Committee also directs NNSA to conduct an analysis of alternatives that specifically addresses ways of meeting design and manufacturing needs of allies that accounts for work completed as part of recent and ongoing warhead Life Extension Programs and alterations. The analysis of alternatives shall be submitted to the Committee no later than 180 days after enactment of this act.

B83 Sustainment.—The Committee is concerned about the feasibility of maintaining the B83-1 in the stockpile without deferring key maintenance activities and at reduced funding levels. At the same time, the Committee is also concerned that the continued retention of the B83-1 may necessitate eventual modifications to the warhead. Such modifications would compete for resources with other ongoing and planned nuclear weapons modernization and development efforts. Accordingly, the Committee directs NNSA, with the assistance of the NWC if necessary, to report within 120 days on the following: current surveillance findings regarding the B83-1, to include the results of the past three annual assessments and any identified limitations of the weapon; the estimated cost to maintain the B83-1 beyond its originally planned retirement date and a discussion of potential schedule impacts to other weapons programs; a discussion of “suitable replacements” that the NWC has considered for the B83-1, to include the B61-12s and/or the B61-11s soon to be or already in in the stockpile, as well as missile

warheads. The report shall be submitted to Committee no later than 90 days after enactment of this act. The Committee further directs that NNSA submit the report to the Comptroller General at the same time that it submits it to the Committees, and that the Government Accountability Office review the report and brief the Committees on their observations within 90 days of its receipt.

Weapons Dismantlement and Disposition.—The Committee recommends \$56,000,000 for the dismantlement of retired nuclear weapons removed from the stockpile.

Modernization.—The Committee supports continued investment in strategic materials, including management of existing material stockpiles and methods to replenish the supply needed for our national security programs. As the Department progresses through the ongoing warhead Life Extension Programs, it will require the necessary strategic materials to meet the stockpile demands. The Committee has encouraged NNSA to explore all options to ensure it can maintain a consistent supply of purified uranium metal and other strategic materials. The Committee is concerned that NNSA's current plan does not consider all options, may not be the most efficient, and may be ahead of need. Last year, the Committee directed NNSA to complete an independent technical review of all options prior to commencing any work to convert uranium oxide to metal. The results of that review have not been provided to the Committee. No funds are included for work on purified uranium metal at this time.

The Committee continues to support the program of record for plutonium pit production in recognition of new threats and the challenges maintaining readiness on aging systems. The recommendation includes \$8,000,000 for next-generation machining and assembly technology development for high volume pit production. The Committee directs the NNSA to continue to provide a clear breakout of costs for each work activity in future budget requests. Further, NNSA is directed to include, in future budget requests, a breakdown of manpower needs for both pit production and all support functions needed for pit production.

Domestic Uranium Enrichment.—The Committee recommends \$70,000,000 for Domestic Uranium Enrichment, the same as the last year. Funding for downblending high-enriched uranium is included in a separate control point, so no funds are recommended for downblending within Domestic Uranium Enrichment.

STOCKPILE RESEARCH, TECHNOLOGY AND ENGINEERING

The Committee recommends \$2,797,706,000 for Stockpile Research, Technology, and Engineering.

Pit and Plutonium Aging.—The Committee is concerned with the apparent lack of focus on advancing knowledge regarding pit and plutonium aging since the JASONS conducted its first study in 2006. Given the future needs of the nation's nuclear deterrent a robust program of research and experimentation is needed. Therefore, the Committee directs 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. Such a plan shall include estimated cost of ongoing research, new or upgraded capability needs, and

key near-, mid-, and long-range milestones. The plan shall be submitted to the Committees on Appropriations of both the House and the Senate no later than 180 days after enactment of this act.

*Enhanced Capabilities for Subcritical Experiments [ECSE].—*While the Committee recognizes the importance of this project, the growth in cost and requirements, in addition to the technical risks, remain a concern. At the same time, NNSA has stated that certification of future warheads will rely on delivery of this capability. The Committee directs NNSA to brief the Committee Congress not later than 90 days after enactment of this act on its contingency plan if ECSE is not completed on the current schedule.

*Academic Programs.—*The Committee recommends \$82,212,000 for Academic Programs, recognizing the importance of the Academic Programs in supporting fundamental science and technology research at universities that support stockpile stewardship, the development of the next generation of highly-trained workforce, and the maintenance of a strong network of independent technical peers. Within this amount, not less than \$5,000,000 is recommended for Tribal Colleges and NNSA is directed to fully distribute this funding to Tribal Colleges and Universities. The Committee encourages continued research in High Energy Density Plasmas and recognizes the partnerships between the laboratories and research universities to address the critical need for skilled graduates to replace an aging workforce at our NNSA laboratories. Within available funds, the Committee recommends up to \$4,000,000 for the Joint Program in High Energy Density Laboratory Plasmas.

*Inertial Confinement Fusion Ignition and High-Yield.—*The Committee recommends \$575,000,000 for the Inertial Confinement Fusion Ignition and High-Yield Campaign program and notes that the Joint Program in High Energy Density Laser Plasmas has been moved to the Academic Programs line item. Within available funds, not less than \$82,000,000 is for the OMEGA Laser Facility, not less than \$349,000,000 is for the National Ignition Facility, not less than \$66,000,000 is for the Z Facility, and not less than \$6,000,000 is for the NIKE Laser at the Naval Research Laboratory. The Committee recognizes that a predictable and sustained availability of targets is essential to the operations of NNSA's laser facilities. To help address target procurement issues, the Committee establishes a new line item dedicated to target production to raise visibility and accountability, and recommends not less than \$31,000,000 be provided by the NNSA to target vendors for target research, development and fabrication to cost-effectively operate the NIF, Z, and OMEGA facilities.

*Partnerships with the Office of Science.—*The Committee strongly encourages the NNSA to develop additional partnerships with the Office of Science to utilize the Advanced Photon Source [APS] and Linac Coherent Light Source [LCLS] x-ray light sources. The NNSA is directed to brief the Committee within 90 days of enactment of this act on its plans to work with the Office of Science to incorporate additional capabilities in the planned upgrades at LCLS and APS that will address NNSA mission needs to interrogate the behavior of materials at length and timescales necessary to study materials aging and modern manufacturing methods.

Weapons Technology and Manufacturing Maturation.—The Committee recommends \$297,965,000 for Weapons Technology and Manufacturing Maturation, including \$111,908,000 for Advanced Manufacturing Development. Within available funds for Advanced Manufacturing Development, \$10,000,000 is recommended to modernize and upgrade legacy applications at weapons production facilities to improve manufacturing and safety.

INFRASTRUCTURE AND OPERATIONS

The Committee recommends \$4,347,005,000 for Infrastructure and Operations.

Project 06-D-141, Uranium Processing Facility, Y-12, Oak Ridge, Tennessee.—The Committee recommends \$750,000,000 to continue construction activities of the five remaining subprojects of the Uranium Processing Facility, including the Main Process Building and the Salvage and Accountability Building.

The Committee supports the ongoing effort to replace existing enriched uranium capabilities currently residing in Building 9212 by 2025 for not more than \$6,500,000,000 and the strategy of breaking the project into more manageable subprojects. This practice is specifically permitted by DOE Order 413.3B, and is a practical approach for any project of this magnitude.

Maintenance and Repair of Facilities.—Within the amounts provided, the Committee recommends not less than \$50,000,000 for ongoing infrastructure improvements and maintenance activities at the Nevada National Security Site.

Capability Based Investments.—The Committee recommends \$149,117,000 for Capability Based Investments.

The Committee recognizes that trusted microelectronics are a national security priority and continues to support plans to upgrade the capability for producing trusted and strategic radiation-hardened microelectronics to ensure the safety, security, reliability, and effectiveness of the Nation's nuclear deterrent. The NNSA is directed to proceed with early planning activities necessary to reach CD-1 for the planned Heterogeneous Integration Facility at Sandia National Laboratories and shall keep the Committee informed of any delays or additional funding requirements to meet CD-1.

The Committee directs the NNSA Office of Nuclear Materials Integration to develop a plan and estimate for the cost to establish an analytical testing laboratory in partnership with the Nevada National Security Site [NNS], which supports a nuclear forensics mission consistent with the goals of the department and the site. The plan shall include a strategy for partnering with an appropriate institute of higher education. The goal of the laboratory will be to leverage the capabilities of all collaborative parties to establish the analytical capabilities to define the nuclear signatures of critical nuclear materials for national security.

DEFENSE NUCLEAR SECURITY

The Committee recommends \$826,895,000 for Defense Nuclear Security.

Project 17-D-710, West End Protected Area Reduction, Y-12.—The Committee recommends \$26,000,000 for the West End Pro-

tected Area Reduction, and encourages NNSA to complete CD-2 and proceed to construction without delay.

DEFENSE NUCLEAR NONPROLIFERATION

Appropriations, 2020	\$2,164,000,000
Budget estimate, 2021	2,031,000,000
Committee recommendation	2,095,000,000

The Committee recommends \$2,095,000 for Defense Nuclear Nonproliferation, an increase of \$64,000,000 above the budget request.

Defense Nuclear Nonproliferation provides a vitally important component of our national security, preventing nuclear materials and weapons from falling into the wrong hands, including non-weapons nations, terrorist organizations, and other non-state entities. This mission is challenged by an increasingly dangerous world with emerging and evolving threats, in addition to the proliferation of technologies that simplify production, manufacturing, and design of nuclear materials and weapons.

Within available funds, the Committee recommends \$15,000,000 for NNSA's three University Consortia for Nuclear Nonproliferation Research educate undergraduate and graduate students in specialized fields essential to sustaining the workforce in nonproliferation technology, while contributing research and development to DOE's nuclear complex.

As the Office of Nuclear Energy works to promote delivery of advanced reactors, NNSA will play a vital role in making sure appropriate safeguards are considered early in the process. The Committee directs NNSA to cooperate and support the Office of Nuclear Energy in developing safeguards concepts, policies, and technologies to address the proliferation challenges unique to advanced nuclear reactors. Further, NNSA shall work with the Nuclear Regulatory Commission and the national laboratories and industry to ensure the implementation of "safeguards-by-design" features in advanced nuclear reactors.

Domestic Radiological Security.—The Committee recommends \$147,002,000 for Domestic Radiological Security, including not less than \$35,000,000 for the Cesium Irradiator Replacement Program. Within this amount \$10,000,000 is to address recovery and decontamination efforts associated the container breach and release of material in Seattle, Washington, on May 2, 2019.

The Committee recognizes the importance of bilateral and multilateral agreements and organizations in detecting, intercepting and deterring nuclear and radiological threats. The Committee urges the full use of these partnerships to further strengthen U.S. and global security. Within available funds, the Committee encourages the Y-12 National Security Complex's Nuclear and Radiological Field Training Center to partner with interested State or local governments to improve capabilities to train first responders, National Guard specialized units, and other experts in nuclear operations, safeguards, cyber, and emergency operations.

Materials Management and Minimization.—The Committee recommends \$60,000,000 for Laboratory and Partnership Support to facilitate interactions between the national laboratories, production facilities and private companies seeking to produce Molybdenum-

99 without the use of high-enriched uranium. Within Laboratory and Partnership Support, \$50,000,000 is recommended for the competitively-awarded funding opportunity to expedite the establishment of a stable domestic source of Mo-99 that was directed in the Energy and Water Development and Related Agencies Appropriations Act, 2020, and \$10,000,000 is recommended to facilitate interactions between the national laboratories, production facilities and private companies in this area.

Low Enriched Uranium for Naval Applications.—Within available funds for Defense Nuclear Nonproliferation Research and Development, the Committee recommends \$15,000,000 for Advanced Low Enriched Uranium Fuel Research and Development for the national laboratories to develop low-enriched fuels that could replace highly enriched uranium for naval applications. Consistent with section 7319 of title 10, United States Code, this funding is recommended within the Defense Nuclear Nonproliferation account. This work shall be managed within Defense Nuclear Nonproliferation.

NAVAL REACTORS

Appropriations, 2020	\$1,648,396,000
Budget estimate, 2021	1,684,000,000
Committee recommendation	1,684,000,000

The Committee recommends \$1,684,000,000 for Naval Reactors, the same as the budget request. The Committee’s recommendation fully funds important national priorities, including the *Columbia*-class replacement submarine design and the prototype refueling. Naval Reactors currently relies on high-enriched uranium from weapons that have been removed from the stockpile to fuel the Navy’s aircraft carriers and submarines. The Committee encourages Naval Reactors to continue working with the NNSA to ensure there is a long-term plan that meets the Navy’s needs for high-enriched uranium.

COLUMBIA-CLASS REACTOR SYSTEMS DEVELOPMENT

The Committee recommends \$64,700,000 for *Columbia*-Class Reactor Systems Development. *Columbia*-class submarines are vital to maintain our survivable deterrent. The Committee remains concerned about on-time delivery of the first *Columbia*-Class submarine, in part because Naval Reactors’ assertions regarding schedule margin for the propulsion plant have been inconsistent. The Committee notes that Naval Reactors has not provided the quarterly updates to the Committee that were directed last year, and directs Naval Reactors to provide the initial brief within two weeks of enactment of this act.

NAVAL REACTORS DEVELOPMENT

The Committee recommends \$545,000,000 for Naval Reactors Development. Within the available funds, the Committee recommends \$87,275,000 for the Advanced Test Reactor.

S8G PROTOTYPE REFUELING

The Committee recommends \$135,000,000 for S8G Prototype Refueling, the same as the budget request. The Committee recognizes the importance of on-time completion of the prototype refueling, and places higher priority on this project than research and development for future reactor designs.

CONSTRUCTION

The Committee recommends \$334,000,000 for Construction. Within available funds, the Committee recommends \$330,000,000 for the Spent Fuel Handling Facility in Idaho.

FEDERAL SALARIES AND EXPENSES

Appropriations, 2020	\$434,699,000
Budget estimate, 2021	454,000,000
Committee recommendation	443,200,000

The Committee recommends \$443,200,000 for Federal Salaries and Expenses, the same as the budget request. The Committee recognizes the importance of recruiting and retaining the highly-skilled personnel needed to meet NNSA’s important mission. Chronic underfunding in this account has led to understaffing across multiple areas, even as overall NNSA workload has increased. In order to remedy the situation, NNSA needs to continue hiring an adequate number of personnel with the right skills mix. The Committee directs NNSA to continue providing the monthly updates on the status of hiring and retention.

DEFENSE ENVIRONMENTAL CLEANUP

Appropriations, 2020	\$6,255,000,000
Budget estimate, 2021	4,983,608,000
Committee recommendation	6,360,000,000

The Committee recommendation for Defense Environmental Cleanup is \$6,360,000,000, an increase of \$1,376,392,000 above the budget request. Within available funds, the Department is directed to fund the hazardous waste worker training program at \$10,000,000.

Future Budget Requests.—The Committee directs the Department to include out-year funding projections in the annual budget request for Environmental Management, and an estimate of the total cost and time to complete each site.

Richland.—As a signatory to the Tri-Party Agreement, the Department of Energy is required to meet specific compliance milestones toward the cleanup of the Hanford site. Among other things, the Department committed to provide the funding necessary to enable full compliance with its cleanup milestones. Unfortunately, if the Department’s Fiscal Year 2021 budget request were enacted, future fiscal year Tri-Party Agreement milestones could be at risk, threatening high-risk cleanup projects near the City of Richland, Washington, and the economically- and environmentally-important Columbia River. The Committee recognizes that significant progress has been made at the Hanford Site. However, because the Department’s budget request could slow or halt critical cleanup

work and threaten the Department's compliance with its legal obligations under the Tri-Party Agreement, the Committee recommends \$926,100,000 for Richland Operations.

Additional funding is provided to continue cleanup of the 300–296 waste site under the 324 Building; increased surveillance and maintenance and risk reduction activities associated with legacy waste sites as recommended in the February 2020 Government Accountability Office Report; and community and regulatory support. The Committee recommends \$15,000,000 for the West End Storage Facility Modification and Capsule Storage project (Project 18–D-4040).

Within available funds, the Committee recommends not less than \$8,500,000 for the Hazardous Materials Management and Emergency Response facilities. Further, within available funds, the Department is directed to carry out maintenance and public safety efforts at the Manhattan Project National Historical Park, including the B Reactor, including facility improvements needed to expand public access and interpretive programs. None of the Richland Operations funds shall be used to directly carry out waste removal or treatment activities within the Office of River Protection's tank farms.

NNSA Sites.—The Committee rejects the proposed rescission of funds previously directed to address high-risk and legacy contamination at Lawrence Livermore National Laboratory. Further, the Committee notes that the Department has not yet submitted the ten-year plan for decommissioning excess facilities at Livermore and directs the Department to do so expeditiously to enable Congressional oversight.

Within the funds provided for Los Alamos National Laboratory, the Committee recommends full funding of \$3,394,000 as requested for continued support of Miscellaneous Programs and Agreements in Principle including for the Regional Coalition of Los Alamos National Laboratory Communities, the Natural Resource Damage Assessment and Trustee Council, the Los Alamos Pueblo Program, the Los Alamos National Laboratory Community Participation Program and regulatory support activities with state regulators.

Oak Ridge Reservation.—The Committee recommends \$475,383,000 for the Oak Ridge Reservation.

The Committee remains disappointed in the delays in issuing the Record of Decision for the new landfill and notes the Department has not provided the results of the evaluation of the cost of onsite disposal compared to offsite disposal, and the economic impact to the local community. The required brief should be provided as soon as possible.

Additional funds above the budget request are recommended to address the growing backlog of deferred maintenance associated with Environmental Management owned facilities. The Department should also focus on the cleanup of excess contaminated facilities, many of which are on the Department's list of high-risk facilities, to reduce threats to worker safety and health and to provide for future use, including remaining cleanup at the biology complex.

Community and Regulatory Support.—The Committee recommends \$5,900,000 for Community and Regulatory Support, but notes the Department has not provided the work plan from the

State of Tennessee. Continued funding is contingent upon measurable progress in review and disposition of regulatory documents necessary for cleanup at the site.

U-233 Disposition Program.—The Committee recommends \$55,000,000 for the disposition of material in Building 3019. Removal of legacy material from this building, an aging facility in the heart of the Oak Ridge National Laboratory central campus, must remain a high priority for the Department. Removal of the Uranium-233 will enable the overall security posture at the laboratory to be relaxed, which will reduce costs, eliminate nuclear safety issues, and make the campus more conducive to collaborative science. The Committee supports the Department's current approach to expedite the disposition of material in Building 3019, using a public-private partnership that will reduce the overall cost of cleanup.

Mercury Treatment Facility.—The Committee recommends \$20,500,000 to complete construction of the Outfall 200 Mercury Treatment Facility. Remediation of mercury contamination at the Oak Ridge Reservation is an important precursor to full site remediation. Reducing the mercury being released into the East Fork of Poplar Creek continues to be among the highest priorities for the Environmental Management program.

Office of River Protection.—The Committee recommends \$1,645,000,000 for the Office of River Protection. Funds above the budget request are provided to continue tank waste retrievals and design and construct facilities necessary to meet near-term waste treatment goals. Funds are also provided to resume full engineering, procurement, and construction work on the High-Level Waste Treatment Facility and to ensure compliance with the 2016 Consent Decree and Tri-Party Agreement milestones. Funds that support the Waste Treatment Plant project are provided separately for: 1) Low-Activity Waste Treatment Facility, Analytical Laboratory, and Balance of Facilities; 2) High-Level Waste Treatment Facility; 3) Pre-Treatment Facility; and 4) Low Activity Waste Pretreatment System. The Department shall not move forward with placing the High-Level Waste Treatment Facility and Pre-Treatment Facility into preservation mode for any length of time.

The Committee notes that the budget request does not include funding for low level waste offsite disposal, but that fiscal year 2020 funds are still available for this purpose. Accordingly, the recommendation provides no funds for this effort, and the Department shall provide notification to the Committee if any additional funds are proposed for this project, including the amount and source of funds.

Savannah River Site.—The Committee recommends \$1,531,659,000 for the Savannah River site. Within available funds, not less than \$3,000,000 is for disposition of spent fuel from the High Flux Isotope Reactor, \$11,249,000 is for Community and Regulatory Support, and \$25,000,000 is for the Advanced Manufacturing Collaborative.

Technology Development and Demonstration.—The Committee recommends \$30,000,000 for Technology Development and Demonstration. The Committee supports the Department's efforts to expand technology development and demonstration to address its

long-term and technically complex cleanup challenges. Within the amount recommended, not less than \$5,000,000 is recommended for work on qualification, testing and research to advance the state-of-the-art on containment ventilation systems. Further, the Department is directed to take the necessary steps to implement and competitively award a cooperative university affiliated research center for that purpose.

Within the amount recommended, not less than \$5,000,000 is recommended to fund the existing cooperative agreement with the Consortium for Risk Evaluation with Stakeholder Participation [CRESP] and not less than \$6,500,000 is recommended for the development and deployment of Wearable Robotic Devices for Worker Safety.

OTHER DEFENSE ACTIVITIES

Appropriations, 2020	\$906,000,000
Budget estimate, 2021	1,054,727,000
Committee recommendation	906,000,000

The Committee recommends \$906,000,000 for Other Defense Activities, a decrease of \$148,727,000 below the budget request. Within available funds, the Committee recommends \$270,000,000 for Specialized Security Activities. The Committee does not support the administration’s request to move funding for formerly Utilized Sites Remedial Action Program [FUSRAP] to the Office of Legacy Management, so there is no funding for that purpose included within Other Defense Activities. Within the available funds for Environment, Health and Safety, the Committee recommends not less than \$1,000,000 for the Epidemiologic Study of One Million U.S. Radiation Workers and Veterans, which was originally approved by the Office of Science in 2012.

The Committee is aware that in response to Congressional direction, DOE is revising Order 140.1, Interface with the Defense Nuclear Facilities Safety Board [DNFSB]. The secretary is directed to finalize the revision of Order 140.1 in consultation with the members of the DNFSB. In addition, the Secretary is directed to work with the board to establish a bilateral memorandum of understand between the two agencies to assure operational interface issues between the agencies are fully resolved.

POWER MARKETING ADMINISTRATIONS

The Committee recognizes the important role the Power Marketing Administrations [PMAs] play in delivering affordable power, maintaining grid reliability, and supporting the Nation’s Federal multi-purpose water projects. The Department’s request to divest the transmission assets of the Bonneville Power Administration, Southwestern Power Administration, and Western Area Power Administration could increase costs for millions of consumers, decrease grid reliability, and reduce services to rural communities. No funds are recommended to divest transmission assets of the PMAs. Further, the Committee reminds the Department of the prohibition on studying transfer of PMA assets, included in the Urgent Supplemental Appropriations Act, 1986 (Public Law 99–349).

The Committee also rejects the Department’s request to authorize the PMAs to establish market-based power rates like for-profit investor-owned utilities, as current law requires the PMAs to set rates to recover all of the costs associated with the generation and delivery of power and these cost-based rates must be at the “lowest possible cost consistent with sound business principles.” The Committee directs the Department to fully comply with existing Federal law which supports cost-based rates.

CBO has continued to raise questions about the current receipt authority provided in this and prior year appropriations acts to create carryover of unobligated balances for purchase power and wheeling expenditures [PPW]. Since the scoring for PPW receipts has historically equaled expenses as a result of a 2001 scoring agreement, the Committee continues to be unable to recommend the full budget request for PPW expenses for the Southeastern Power Administration, Southwestern Power Administration, or Western Area Power Administration due to CBO scoring. The Committee recommends the full amount for PPW expenses that CBO has estimated will be spent for those purposes in fiscal year 2021, which is approximately \$129,281,000 lower (in the aggregate) than the budget request. The Committee will continue to work to resolve the differences in the CBO and administration estimates for PPW expenses.

OPERATIONS AND MAINTENANCE, SOUTHWESTERN POWER
ADMINISTRATION

Appropriations, 2020	\$10,400,000
Budget estimate, 2021	10,400,000
Committee recommendation	10,400,000

The Committee recommends a net appropriation of \$10,400,000 for the Southwestern Power Administration.

CONSTRUCTION, REHABILITATION, OPERATIONS AND MAINTENANCE,
WESTERN AREA POWER ADMINISTRATION

Appropriations, 2020	\$89,196,000
Budget estimate, 2021	89,372,000
Committee recommendation	89,372,000

The Committee recommends a net appropriation of \$89,372,000 for the Western Area Power Administration.

FALCON AND AMISTAD OPERATING AND MAINTENANCE FUND

Appropriations, 2020	\$228,000
Budget estimate, 2021	228,000
Committee recommendation	228,000

The Committee recommends a net appropriation of \$228,000 for the Falcon and Amistad Operating and Maintenance Fund.

FEDERAL ENERGY REGULATORY COMMISSION

SALARIES AND EXPENSES

Appropriations, 2020	\$382,000,000
Budget estimate, 2021	404,350,000
Committee recommendation	404,350,000

REVENUES APPLIED

Appropriations, 2020	\$-382,000,000
Budget estimate, 2021	-404,350,000
Committee recommendation	-404,350,000

The Committee recommends a net appropriation of \$0 for the Federal Energy Regulatory Commission [FERC].

The Committee encourages FERC to prioritize meaningful opportunities for public engagement and coordination with State and local governments in the Federal permitting and review processes of energy infrastructure proposals. Specifically, review processes should remain transparent and consistent, and ensure the health, safety, and security of the environment and each affected community.

Interstate Pipeline Reliability.—The Committee is concerned with the continued reliability of the interstate natural gas transmission system. On September 23, 2020 the Government Accountability Office [GAO] published a report, *Interstate Transportation of Natural Gas Is Generally Reliable, but FERC Should Better Identify and Assess Emerging Risks* (GAO-20-658), which recommended FERC use all available information to identify and assess risks to the reliability of natural gas transmission service and to develop and document appropriate responses to service disruptions. The Committee believes a timely analysis of prior incidents of service interruptions and system-wide vulnerabilities can help mitigate the impacts of future service interruptions and improve natural gas pipeline operator’s preparedness and response to an emergency or incident on the interstate pipeline system. The Committee directs FERC to brief the Committee on implementation of GAO’s recommendations within 60 days of enactment of this act; and further, submit a report, in consultation with state regulators and the Pipeline and Hazardous Materials Safety Administration, to the Committee within 120 days of enactment of this act, on broader efforts to work with natural gas pipeline operators, to ensure the reliability of the interstate natural gas pipeline system and include any statutory or regulatory barriers to achieving this goal.

DEPARTMENT OF ENERGY
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
ENERGY PROGRAMS					
ENERGY EFFICIENCY AND RENEWABLE ENERGY					
Sustainable Transportation:					
Vehicle Technologies	396,000	74,400	410,000	+ 14,000	+ 335,600
Bioenergy Technologies	259,500	44,500	244,500	- 15,000	+ 200,000
Hydrogen and Fuel Cell Technologies	150,000	42,000	150,000	.....	+ 108,000
Subtotal, Sustainable Transportation	805,500	160,900	804,500	- 1,000	+ 643,600
Renewable Energy:					
Solar Energy Technologies	280,000	67,000	233,800	- 46,200	+ 166,800
Wind Energy Technologies	104,000	22,100	115,000	+ 11,000	+ 92,900
Water Power Technologies	148,000	45,000	148,000	.....	+ 103,000
Geothermal Technologies	110,000	26,000	105,000	- 5,000	+ 79,000
Renewable Energy Grid Integration .....	.....	.....	40,000	+ 40,000	+ 40,000
Subtotal, Renewable Energy	642,000	160,100	641,800	- 200	+ 481,700
Energy Efficiency:					
Advanced Manufacturing	395,000	94,600	395,000	.....	+ 300,400
Building Technologies	285,000	61,000	295,000	+ 10,000	+ 234,000
Federal Energy Management Program	40,000	8,400	40,000	.....	+ 31,600
Weatherization:					
Weatherization assistance program	305,000	.....	305,000	.....	+ 305,000
Training and technical assistance	3,500	.....	5,000	+ 1,500	+ 5,000
Subtotal, Weatherization	308,500	.....	310,000	+ 1,500	+ 310,000
State Energy Program Grants	62,500	.....	62,500	.....	+ 62,500
Subtotal, Weatherization and Intergovernmental Program	371,000	.....	372,500	+ 1,500	+ 372,500

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Subtotal, Energy Efficiency	1,091,000	164,000	1,102,500	+ 11,500	+ 938,500
Corporate Support:					
Facilities and Infrastructure:					
National Renewable Energy Laboratory (NREL)	130,000	107,000	130,000		+ 23,000
Program Direction	165,000	122,563	161,000	- 4,000	+ 38,437
Strategic Programs	14,500	5,000	14,500		+ 9,500
Subtotal, Corporate Support	309,500	234,563	305,500	- 4,000	+ 70,937
Subtotal, Energy Efficiency and Renewable Energy	2,848,000	719,563	2,854,300	+ 6,300	+ 2,134,737
Rescission	-58,000		-2,240	+55,760	-2,240
Prior Year Balances			-4,060	-4,060	-4,060
TOTAL, ENERGY EFFICIENCY AND RENEWABLE ENERGY	2,790,000	719,563	2,848,000	+ 58,000	+ 2,128,437
CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE					
Cybersecurity for Energy Delivery Systems	95,000	103,100	96,479	+ 1,479	- 6,621
Infrastructure Security and Energy Restoration	48,000	70,000	48,000		- 22,000
Program Direction	13,000	11,521	11,521	- 1,479	
TOTAL, CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE	156,000	184,621	156,000		- 28,621
ELECTRICITY					
Transmission Reliability and Resilience	57,000	55,950	51,000	- 6,000	- 4,950
Resilient Distribution Systems	45,000	18,300	58,000	+ 13,000	+ 39,700
Energy Storage:					
Research	55,000	43,500	50,000	- 5,000	+ 6,500
Construction: 20-0E-100 Grid Storage Launchpad	1,000	40,000	30,000	+ 29,000	- 10,000

Subtotal, Energy Storage	56,000	83,500	80,000	+ 24,000	- 3,500
Transformer Resilience and Advanced Components	7,000	9,000	8,000	+ 1,000	- 1,000
DCEI Energy Mission Assurance .....	.....	1,650	1,000	+ 1,000	- 650
Transmission Permitting and Technical Assistance	7,000	7,000	7,000	.....	.....
Program Direction	18,000	19,645	18,000	.....	- 1,645
TOTAL, ELECTRICITY	190,000	195,045	223,000	+ 33,000	+ 27,955
NUCLEAR ENERGY					
Research and Development:					
Integrated University Program	5,000	.....	5,000	.....	+ 5,000
STEP R&D	5,000	.....	5,000	.....	+ 5,000
Nuclear Energy Enabling Technologies:					
Crosscutting Technology Development	25,000	28,000	23,369	- 1,631	- 4,631
Joint Modeling and Simulation Program	35,000	30,000	40,000	+ 5,000	+ 10,000
Nuclear Science User Facilities	30,000	28,000	35,000	+ 5,000	+ 7,000
Transformational Challenger Reactor	23,450	30,000	30,000	+ 6,550	.....
Beamline NSLS-II, BNL .....	.....	.....	2,000	+ 2,000	+ 2,000
New Materials Development .....	.....	.....	5,000	+ 5,000	+ 5,000
Subtotal, Nuclear Energy Enabling Technologies	113,450	116,000	135,369	+ 21,919	+ 19,369
Fuel Cycle Research and Development:					
Front End Fuel Cycle:	.....	.....	.....	.....	.....
Mining, Conversion, and Transportation	2,000	2,000	2,000	.....	.....
Civil Nuclear Enrichment	40,000	40,000	40,000	.....	.....
Subtotal, Front End Fuel Cycle	42,000	42,000	42,000	.....	.....
Material Recovery and Waste Form Development					
Subtotal, Material Recovery and Waste Form Development	30,000	12,000	25,000	- 5,000	+ 13,000
Advanced Fuels:					
Accident Tolerant Fuels	95,600	36,000	115,000	+ 19,400	+ 79,000
Triso Fuel and Graphite Qualification	30,000	34,000	30,000	.....	- 4,000
Subtotal, Advanced Fuels	125,600	70,000	145,000	+ 19,400	+ 75,000
Fuel Cycle Laboratory R&D					
Used Nuclear Fuel Disposition R&D	20,000	3,000	20,000	.....	+ 17,000
Integrated Waste Management System	62,500	60,000	30,000	- 32,500	- 30,000
Subtotal, Fuel Cycle Laboratory R&D	82,500	63,000	50,000	- 19,500	+ 17,000
TOTAL, ELECTRICITY AND FUEL CYCLE	312,500	318,045	373,000	+ 60,455	+ 44,955

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Nuclear Waste Disposal			27,500	+ 27,500	+ 27,500
Subtotal, Fuel Cycle Research and Development	305,100	187,000	289,500	- 15,600	+ 102,500
Reactor Concepts RD&D:					
Advanced Small Modular Reactor RD&D	100,000	10,000	100,000		+ 90,000
Light Water Reactor Sustainability	47,000	30,500	47,000		+ 16,500
Advanced Reactor Technologies	55,000	71,000	50,000	- 5,000	- 21,000
Versatile Advanced Test Reactor R&D	65,000			- 65,000	
Subtotal, Reactor Concepts RD&D	267,000	111,500	197,000	- 70,000	+ 85,500
Versatile Test Reactor Project:					
Other Project Costs		262,000	5,000	+ 5,000	- 257,000
21-E-200 VTR Project		33,000	40,000	+ 40,000	+ 7,000
Subtotal, Versatile Test Reactor Project		295,000	45,000	+ 45,000	- 250,000
Advanced Reactors Demonstration Program:					
National Reactor Innovation Center	20,000	10,000	20,000		+ 10,000
Demonstration 1	80,000		87,500	+ 7,500	+ 87,500
Demonstration 2	80,000		87,500	+ 7,500	+ 87,500
Risk Reduction for Future Demonstrations	30,000		50,000	+ 20,000	+ 50,000
Regulatory Development	15,000	7,500	30,000	+ 15,000	+ 22,500
Advanced Reactors Safeguards	5,000	2,500	5,000		+ 2,500
Subtotal, Advanced Reactors Demonstration Program	230,000	20,000	280,000	+ 50,000	+ 260,000
Subtotal, Research and Development	925,550	729,500	956,869	+ 31,319	+ 227,369
Infrastructure:					
ORNL Nuclear Facilities O&M	20,000		28,000	+ 8,000	+ 28,000
INL Facilities Operations and Maintenance	280,000	208,000	273,000	- 7,000	+ 65,000

Research Reactor Infrastructure	9,000	11,500	11,500	+ 2,500	.....
Construction:					
16-E-200 Sample Preparation Laboratory, INL	25,450	18,000	18,000	- 7,450	.....
Advanced Nuclear Materials Laboratory, ORNL			5,000	+ 5,000	.....
Subtotal, Construction	25,450	18,000	23,000	- 2,450	+ 5,000
Subtotal, Infrastructure	334,450	237,500	335,500	+ 1,050	+ 98,000
Idaho Site-wide Safeguards and Security	153,408	137,800	137,800	- 15,608	.....
Program Direction	80,000	75,131	75,131	- 4,869	.....
TOTAL, NUCLEAR ENERGY	1,493,408	1,179,931	1,505,300	+ 11,892	+ 325,369
URANIUM RESERVE PROGRAM		150,000	120,000	+ 120,000	- 30,000
FOSSIL ENERGY RESEARCH AND DEVELOPMENT					
Coal CCS and Power Systems					
Carbon Capture	117,800	78,000	113,600	- 4,200	+ 35,600
Carbon Utilization		15,000	.....	.....	- 15,000
Carbon Storage	100,000	30,000	100,000	.....	+ 70,000
Advanced Energy Systems	120,000	285,400	120,000	.....	- 165,400
Cross Cutting Research	56,000	101,750	56,000	.....	- 45,750
NETL Coal Research and Development	61,000	36,000	61,000	.....	+ 25,000
STEP (Supercritical CO2)	16,000	8,000	8,000	- 8,000	+ 8,000
Transformational Coal Pilots	20,000	.....	20,000	.....	+ 20,000
Subtotal, Coal CCS and Power Systems	490,800	546,150	478,600	- 12,200	- 67,550
Natural Gas Technologies:					
Research	51,000	15,000	55,000	+ 4,000	+ 40,000
Unconventional Fossil Energy Technologies	46,000	17,000	46,000	.....	+ 29,000
Program Direction	61,500	62,451	61,500	.....	- 951
Special Recruitment Programs	700	900	900	+ 200	.....
NETL Research and Operations	50,000	46,000	50,000	.....	+ 4,000
NETL Infrastructure	50,000	43,100	58,000	+ 8,000	+ 14,900
TOTAL, FOSSIL ENERGY RESEARCH AND DEVELOPMENT	750,000	730,601	750,000	.....	+ 19,399
NAVAL PETROLEUM AND OIL SHALE RESERVES	14,000	13,006	13,006	- 994	.....

DEPARTMENT OF ENERGY—Continued
 [In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
STRATEGIC PETROLEUM RESERVE					
Strategic Petroleum Reserve	195,000	187,081	187,081	-7,919	.....
Sale of Crude Oil	-450,000	.....	.....	+450,000	.....
Use of Sale Proceeds	450,000	.....	.....	-450,000	.....
TOTAL, STRATEGIC PETROLEUM RESERVE	195,000	187,081	187,081	-7,919	.....
SPR PETROLEUM ACCOUNT					
Strategic Petroleum Reserve	10,000	.....	1,000	-9,000	+1,000
Sale of Crude Oil .....	.....	-87,000	.....	.....	+87,000
Use of Sale Proceeds .....	.....	19,000	.....	.....	-19,000
TOTAL, SPR PETROLEUM ACCOUNT	10,000	-68,000	1,000	-9,000	+69,000
NORTHEAST HOME HEATING OIL RESERVE					
Northeast Home Heating Oil Reserve	10,000	.....	10,000	.....	+10,000
Sale of Northeast Home Heating Oil Reserve .....	.....	-84,000	.....	.....	+84,000
TOTAL, NORTHEAST HOME HEATING OIL RESERVE	10,000	-84,000	10,000	.....	+94,000
ENERGY INFORMATION ADMINISTRATION					
NON-DEFENSE ENVIRONMENTAL CLEANUP					
Fast Flux Test Reactor Facility (WA)	2,500	2,500	2,500	.....	.....
Gaseous Diffusion Plants	113,085	115,554	115,554	+2,469	.....
Small Sites	127,000	69,653	119,833	-7,167	+50,180
West Valley Demonstration Project	75,215	88,113	88,113	+12,898	.....
Management and Storage of Elemental Mercury	1,200	.....	.....	-1,200	.....
Mercury Receipts .....	.....	-3,000	3,000	+3,000	+6,000
Use of Mercury Receipts .....	.....	3,000	-3,000	-3,000	-6,000
TOTAL, NON-DEFENSE ENVIRONMENTAL CLEANUP	126,800	128,710	126,800	.....	-1,910

	200				- 200
Community and Regulatory Support					
TOTAL, NON-DEFENSE ENVIRONMENTAL CLEANUP	319,200	275,820	326,000	+ 6,800	+ 50,180
URANIUM ENRICHMENT DECONTAMINATION AND DECOMMISSIONING FUND					
Oak Ridge	195,693	144,701	134,701	- 60,992	- 10,000
Nuclear Facility D&D, Paducah	240,000	206,518	240,000		+ 33,482
Portsmouth:					
Nuclear Facility D&D, Portsmouth	367,193	351,854	367,193		+ 15,339
Construction:					
15-U-408 On-site Waste Disposal Facility, Portsmouth	41,102	46,639	46,639	+ 5,537	
20-U-401 On-site Waste Disposal Facility (Cell Line 2&3)	10,000	16,500	16,500	+ 6,500	
Subtotal, Portsmouth	418,295	414,993	430,332	+ 12,037	+ 15,339
Pension and Community and Regulatory Support	21,762	18,748	32,967	+ 11,205	+ 14,219
Title X Uranium/Thorium Reimbursement Program	5,250	21,284	10,000	+ 4,750	- 11,284
TOTAL, UED&D FUND	881,000	806,244	848,000	- 33,000	+ 41,756
SCIENCE					
Advanced Scientific Computing Research:					
Research	791,265	819,106	860,055	+ 68,790	+ 40,949
Construction:					
17-SC-20 Office of Science Exascale Computing Project (SC-ECP)	188,735	168,945	168,945	- 19,790	
Subtotal, Advanced Scientific Computing Research	980,000	988,051	1,029,000	+ 49,000	+ 40,949
Basic Energy Sciences:					
Research	1,853,000	1,751,673	1,859,000	+ 6,000	+ 107,327
Construction:					
18-SC-10 Advanced Photon Source Upgrade (APS-U), ANL	170,000	150,000	160,000	- 10,000	+ 10,000
18-SC-11 Spallation Neutron Source Proton Power Upgrade (PPU), ORNL	60,000	5,000	52,000	- 8,000	+ 47,000
18-SC-12 Advanced Light Source Upgrade (ALS-U), LBNL	60,000	13,000	62,000	+ 2,000	+ 49,000
18-SC-13 Linac Coherent Light Source-II-High Energy (LCLS-II-HE), SLAC	50,000	14,000	52,000	+ 2,000	+ 38,000
19-SC-14 Second Target Station (STS), ORNL	20,000	1,000	29,000	+ 9,000	+ 28,000
21-SC-10 Cryomodule Repair and Maintenance Facility (CRMF), SLAC		1,000	1,000	+ 1,000	

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Subtotal, Construction	360,000	184,000	356,000	-4,000	+172,000
Subtotal, Basic Energy Sciences	2,213,000	1,935,673	2,215,000	+2,000	+279,327
Biological and Environmental Research	750,000	516,934	750,000	.....	+233,066
Fusion Energy Sciences	414,000	313,151	411,500	-2,500	+98,349
Construction:	242,000	107,000	211,000	-31,000	+104,000
14-SC-60 US Contributions to ITER (US ITER)	15,000	5,000	17,500	+2,500	+12,500
20-SC-61 Matter in Extreme Conditions (MEC) Petawatt Upgrade, SJAC	257,000	112,000	228,500	-28,500	+116,500
Subtotal, Fusion Energy Sciences	671,000	425,151	640,000	-31,000	+214,849
High Energy Physics	814,000	697,631	814,000	.....	+116,369
Research	171,000	100,500	171,000	.....	+70,500
Construction:	60,000	20,000	65,000	+5,000	+45,000
11-SC-40 Long Baseline Neutrino Facility / Deep Underground Neutrino Experiment (LBNF/DUNE), FNAL	231,000	120,500	236,000	+5,000	+115,500
18-SC-42 Proton Improvement Plan II (PIP-II), FNAL	1,045,000	818,131	1,050,000	+5,000	+231,869
Subtotal, High Energy Physics	660,000	635,027	689,700	+29,700	+54,673
Nuclear Physics:	40,000	5,300	5,300	-34,700	.....
Research	12,000	12,000	25,000	+13,000	+13,000
Construction:	1,000	1,000	5,000	+4,000	+4,000
14-SC-50 Facility for Rare Isotope Beams, MSU .....	.....	.....	.....	.....	.....
20-SC-51 US Stable Isotope Production and Research Center, ORNL .....	.....	.....	.....	.....	.....
20-SC-52 Electron Ion Collider, BNL .....	.....	.....	.....	.....	.....

Subtotal, Construction	53,000	18,300	35,300	- 17,700	+ 17,000
Subtotal, Nuclear Physics	713,000	653,327	725,000	+ 12,000	+ 71,673
Workforce Development for Teachers and Scientists	28,000	20,500	28,500	+ 500	+ 8,000
Science Laboratories Infrastructure:					
Infrastructure Support:					
Payment in Lieu of Taxes	4,540	4,650	4,650	+ 110	.....
Oak Ridge Landlord	5,610	5,860	5,860	+ 250	.....
Facilities and Infrastructure	56,850	6,200	49,100	- 7,750	+ 42,900
Oak Ridge Nuclear Operations	26,000	6,000	26,000	.....	+ 20,000
Subtotal, Infrastructure Support	93,000	22,710	85,610	- 7,390	+ 62,900
Construction:					
17-SC-71 Integrated Engineering Research Center, FNAL	22,000	12,000	20,500	- 1,500	+ 8,500
18-SC-71 Energy Sciences Capability, PNNL	23,000	23,000	23,000	.....	.....
19-SC-71 Science User Support Center, BNL	20,000	7,000	20,000	.....	+ 13,000
19-SC-72 Electrical Capacity and Distribution Capability, ANL	30,000	.....	.....	- 30,000	.....
19-SC-73 Translational Research Capability, ORNL	25,000	10,000	25,000	.....	+ 15,000
19-SC-74 BioEPIC, LBNL	15,000	6,000	15,000	.....	+ 9,000
20-SC-71 Critical Utilities Rehabilitation Project, BNL	20,000	15,000	20,000	.....	+ 5,000
20-SC-72 Seismic and Safety Modernization, LBNL	10,000	10,000	10,000	.....	.....
20-SC-73 CEBAF Renovation and Expansion, JINAF	2,000	2,000	2,000	.....	.....
20-SC-74 Craft Resources Support Facility, ORNL	15,000	25,000	25,000	+ 10,000	.....
20-SC-75 Large Scale Collaboration Center, SLAC	11,000	8,000	11,240	+ 240	+ 3,240
20-SC-76 Tritium System Demolition and Disposal, PPPL	13,000	19,400	19,400	+ 6,400	.....
20-SC-77 Argonne Utilities Upgrade, ANL	500	2,000	500	.....	- 1,500
20-SC-78 Linear Assets Modernization Project, LBNL	500	2,000	500	.....	- 1,500
20-SC-79 Critical Utilities Infrastructure Revitalization, SLAC	500	2,000	500	.....	- 1,500
20-SC-80 Utilities Infrastructure Project, FNAL	500	2,000	500	.....	- 1,500
21-SC-71 Princeton Plasma Innovation Center, PPPL .....	.....	2,000	250	+ 250	- 1,750
21-SC-72 Critical Infrastructure Recovery & Renewal, PPPL .....	.....	2,000	250	+ 250	- 1,750
21-SC-73 Ames Infrastructure Modernization, Ames .....	.....	2,000	250	+ 250	- 1,750
Subtotal, Construction:	208,000	151,400	193,890	- 14,110	+ 42,490
Subtotal, Science Laboratories Infrastructure	301,000	174,110	279,500	- 21,500	+ 105,390
Safeguards and security	112,700	115,623	121,000	+ 8,300	+ 5,377

DEPARTMENT OF ENERGY—Continued
 [In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Program Direction	186,300	190,306	188,000	+1,700	-2,306
TOTAL, SCIENCE	7,000,000	5,837,806	7,026,000	+26,000	+1,188,194
NUCLEAR WASTE DISPOSAL		27,500			-27,500
ADVANCED RESEARCH PROJECTS AGENCY—ENERGY					
ARPA-E Projects	390,000		395,000	+5,000	+395,000
Program Direction	35,000	21,256	35,000		+13,744
Rescission of Prior Year Balances		-332,000			+332,000
TOTAL, ARPA-E	425,000	-310,744	430,000	+5,000	+740,744
TITLE 17—INNOVATIVE TECHNOLOGY LOAN GUARANTEE PROGRAM					
Administrative Expenses	32,000	3,000	32,000		+29,000
Offsetting Collection	-3,000	-3,000	-3,000		
Rescission		-160,659			+160,659
Cancellation of Commitment Authority		-224,000			+224,000
TOTAL, TITLE 17—INNOVATIVE TECHNOLOGY LOAN					
GUARANTEE PROGRAM	29,000	-384,659	29,000		+413,659
ADVANCED TECHNOLOGY VEHICLES MANUFACTURING LOAN PROGRAM					
Administrative Expenses	5,000		5,000		+5,000
TOTAL, ADVANCED TECHNOLOGY VEHICLES					
MANUFACTURING LOAN PROGRAM	5,000		5,000		+5,000

TRIBAL ENERGY LOAN GUARANTEE PROGRAM					
Administrative Expenses	2,000	.....	.....	.....	+ 2,000
Rescission .....	.....	- 8,500	.....	.....	+ 8,500
TOTAL, TRIBAL ENERGY LOAN GUARANTEE PROGRAM	2,000	- 8,500	.....	.....	+ 10,500
OFFICE OF INDIAN ENERGY POLICY AND PROGRAMS					
Indian Energy Program	17,000	4,479	17,000	.....	+ 12,521
Program Direction	5,000	3,526	5,000	.....	+ 1,474
TOTAL, OFFICE OF INDIAN ENERGY POLICY AND PROGRAMS	22,000	8,005	22,000	.....	+ 13,995
DEPARTMENTAL ADMINISTRATION					
Administrative Operations:					
Salaries and Expenses:					
Office of the Secretary	5,119	5,582	5,582	+ 463	.....
Congressional and Intergovernmental Affairs	4,395	5,616	4,000	- 395	- 1,616
Chief Financial Officer	52,000	53,591	53,591	+ 1,591	.....
Economic Impact and Diversity	10,169	9,931	10,169	.....	+ 238
Chief Information Officer	140,200	134,778	140,200	.....	+ 5,422
Artificial Intelligence and Technology Office	2,500	.....	2,500	.....	+ 2,500
International Affairs	26,825	.....	26,825	.....	+ 26,825
Other Departmental Administration	152,262	163,763	155,300	+ 3,038	- 8,463
Subtotal, Salaries and Expenses	393,470	373,261	398,167	+ 4,697	+ 24,906
Strategic Partnership Projects	40,000	40,000	40,000	.....	.....
Subtotal, Departmental Administration	433,470	413,261	438,167	+ 4,697	+ 24,906
Funding from Other Defense Activities	- 179,092	- 183,789	- 183,789	- 4,697	.....
Total, Departmental Administration (Gross)	254,378	229,472	254,378	.....	+ 24,906
Miscellaneous revenues	- 93,378	- 93,378	- 93,378	.....	.....
TOTAL, DEPARTMENTAL ADMINISTRATION (Net)	161,000	136,094	161,000	.....	+ 24,906
ARTIFICIAL INTELLIGENCE AND TECHNOLOGY OFFICE .....	.....	4,912	.....	.....	- 4,912
INTERNATIONAL AFFAIRS .....	.....	32,959	.....	.....	- 32,959

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
OFFICE OF THE INSPECTOR GENERAL					
Office of the Inspector general	54,215	57,739	57,739	+ 3,524	
TOTAL, OFFICE OF THE INSPECTOR GENERAL	54,215	57,739	57,739	+ 3,524	
TOTAL, ENERGY PROGRAMS	14,633,623	9,819,734	14,846,926	+ 213,303	+ 5,027,192
ATOMIC ENERGY DEFENSE ACTIVITIES NATIONAL NUCLEAR SECURITY ADMINISTRATION WEAPONS ACTIVITIES					
Stockpile Management:					
Stockpile Major Modernization					
B61 Life Extension Program	792,611	815,710	815,710	+ 23,099	
W76-2 Modification Program	10,000			- 10,000	
W88 Alteration Program	304,186	256,922	256,922	- 47,264	
W80-4 Life Extension Program	898,551	1,000,314	1,000,314	+ 101,763	
W87-1 Modification Program	112,011	541,000	541,000	+ 428,989	
W93		53,000	53,000	+ 53,000	
Subtotal, Stockpile Major Modernization	2,117,359	2,666,946	2,666,946	+ 549,587	
Stockpile Sustainment:					
B61 Stockpile systems	71,232			- 71,232	
W76 Stockpile systems	89,804			- 89,804	
W78 Stockpile systems	81,299			- 81,299	
W80 Stockpile systems	80,204			- 80,204	
B83 Stockpile systems	51,543			- 51,543	
W87 Stockpile systems	98,262			- 98,262	
W88 Stockpile systems	157,815			- 157,815	
Subtotal, Stockpile Sustainment	630,159			- 630,159	

Stockpile Sustainment	998,357	998,357	998,357	+ 998,357	.....
Weapons dismantlement and disposition	56,000	56,000	56,000	.....	+ 6,000
Production Operations	568,941	568,941	568,941	+ 568,941	.....
Stockpile Services:					
Production support	543,964	.....	.....	- 543,964	.....
Research and Development support	39,339	.....	.....	- 39,339	.....
R and D certification and safety	236,235	.....	.....	- 236,235	.....
Management, Technology, and Production	305,000	.....	.....	- 305,000	.....
Subtotal, Stockpile Services	1,124,538	.....	.....	- 1,124,538	.....
Subtotal, Stockpile Management	3,928,056	4,284,244	4,290,244	+ 362,188	+ 6,000
Strategic Materials:					
7Uranium Sustainment	94,146	.....	.....	- 94,146	.....
Plutonium Sustainment:					
Plutonium Sustainment Operations	691,284	.....	.....	- 691,284	.....
Plutonium Pit Production Project	21,156	.....	.....	- 21,156	.....
Subtotal, Plutonium sustainment	712,440	.....	.....	- 712,440	.....
Tritium Sustainment	269,000	.....	.....	- 269,000	.....
Lithium Sustainment	28,800	.....	.....	- 28,800	.....
Domestic Uranium Enrichment	70,000	.....	.....	- 70,000	.....
HEU Downblend	90,000	.....	.....	- 90,000	.....
Strategic materials sustainment	256,808	.....	.....	- 256,808	.....
Subtotal, Strategic materials	1,521,194	.....	.....	- 1,521,194	.....
Production Modernization					
Primary Capability Modernization					
Plutonium Modernization					
Los Alamos Plutonium Operations	610,599	610,599	610,599	+ 610,599	.....
21-D-512, Plutonium Pit Production Project, LANL	226,000	226,000	226,000	+ 226,000	.....
Subtotal, Los Alamos Plutonium Modernization	836,599	836,599	836,599	+ 836,599	.....
Savannah River Plutonium Operations	200,000	200,000	200,000	+ 200,000	.....
21-D-511, Savannah River Plutonium Processing Facility, SRS	241,896	241,896	241,896	+ 241,896	.....
Subtotal, Savannah River Plutonium Modernization	441,896	441,896	441,896	+ 441,896	.....

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Enterprise Plutonium Support		90,782	90,782	+ 90,782	.....
Subtotal, Plutonium Modernization		1,369,277	1,369,277	+ 1,369,277	.....
High Explosives & Energetics		63,620	63,620	+ 63,620	.....
HESE OPCS		3,750	3,750	+ 3,750	.....
Subtotal, HE & Energetics		67,370	67,370	+ 67,370	.....
Subtotal, Primary Capability Modernization		1,436,647	1,436,647	+ 1,436,647	.....
Secondary Capability Modernization		457,004	457,004	+ 457,004	.....
Subtotal, Secondary Capability Modernization		457,004	457,004	+ 457,004	.....
Tritium and Domestic Uranium Enrichment		457,112	.....	.....	- 457,112
Tritium and Domestic Uranium Enrichment	312,109	+ 312,109	+ 312,109
Tritium Sustainment and Modernization	90,000	+ 90,000	+ 90,000
HEU Downblend	70,000	+ 70,000	+ 70,000
Domestic Uranium Enrichment
Subtotal, Tritium and Domestic Uranium Enrichment		457,112	472,109	+ 472,109	+ 14,997
Non-Nuclear Capability Modernization		107,137	107,137	+ 107,137	.....
Total, Production Modernization		2,457,900	2,472,897	+ 2,472,897	+ 14,997
Stockpile Research, Technology, and Engineering Assessment Science		773,111	773,111	+ 773,111	.....
Subtotal, Assessment Science		773,111	773,111	+ 773,111	.....
Engineering and Integrated Assessments		337,404	337,404	+ 337,404	.....

Subtotal, Engineering and Integrated Assessments	337,404	337,404	+ 337,404	.....
Inertial Confinement Fusion	554,725	575,000	+ 575,000	+ 20,275
Subtotal, Inertial Confinement Fusion	554,725	575,000	+ 575,000	+ 20,275
Advanced Simulation and Computing	732,014	732,014	+ 732,014	.....
Weapon Technology and Manufacturing Maturation	297,965	297,965	+ 297,965	.....
Subtotal, Weapon Technology and Manufacturing Maturation	297,965	297,965	+ 297,965	.....
Academic Programs	86,912	82,212	+ 82,212	- 4,700
Total, Stockpile Research and Engineering	2,782,131	2,797,706	+ 2,797,706	+ 15,575
Research, Development, Test and Evaluation (RD&E):				
Science:				
Advanced Certification	57,710	.....	- 57,710	.....
Primary Assessment Technologies	95,169	.....	- 95,169	.....
Dynamic Materials Properties	128,000	.....	- 128,000	.....
Advanced Radiography	32,710	.....	- 32,710	.....
Secondary Assessment Technologies	77,553	.....	- 77,553	.....
Academic Alliances and Partnerships	56,000	.....	- 56,000	.....
Enhanced Capabilities for Subcritical Experiments	145,160	.....	- 145,160	.....
Subtotal, Science	592,302	.....	- 592,302	.....
Engineering:				
Enhanced Surety	43,000	.....	- 43,000	.....
Delivery Environments	35,945	.....	- 35,945	.....
Nuclear Survivability	53,932	.....	- 53,932	.....
Studies and Assessments	5,607	.....	- 5,607	.....
Enhanced Surveillance	55,000	.....	- 55,000	.....
Stockpile Responsiveness	70,000	.....	- 70,000	.....
Subtotal, Engineering	263,484	.....	- 263,484	.....
Inertial confinement fusion ignition and high yield:				
Ignition and Other Stockpile Programs	106,000	.....	- 106,000	.....
Diagnostics, Cryogenics and Experimental Support	75,000	.....	- 75,000	.....
Pulsed Power Inertial Confinement Fusion	8,571	.....	- 8,571	.....

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Joint Program in High Energy Density Laboratory Plasmas	8,492	.....	.....	- 8,492	.....
Facility operations and target production	366,937	.....	.....	- 366,937	.....
Subtotal, Inertial Confinement Fusion Ignition and High Yield	565,000	.....	.....	- 565,000	.....
Advanced Simulation and Computing:					
Advanced Simulation and Computing	789,849	.....	.....	- 789,849	.....
Advanced Manufacturing Development:					
Additive Manufacturing	18,500	.....	.....	- 18,500	.....
Component Manufacturing Development	48,410	.....	.....	- 48,410	.....
Process Technology Development	70,000	.....	.....	- 70,000	.....
Subtotal, Advanced manufacturing development	136,910	.....	.....	- 136,910	.....
Subtotal, RD&E	2,347,545	.....	.....	- 2,347,545	.....
Infrastructure and Operations:					
Operations of facilities	900,000	1,014,000	1,014,000	+ 114,000	.....
Safety and environmental operations	110,000	165,354	165,354	+ 55,354	.....
Maintenance and repair of facilities	455,000	792,000	755,428	+ 299,428	- 36,572
Subtotal, Operations	1,465,000	1,971,354	1,934,782	+ 468,782	- 36,572
Recapitalization:					
Infrastructure and safety	447,657	670,000	670,000	+ 222,343	.....
Capability based investments	135,341	149,117	149,117	+ 13,776	.....
Planning for Programmatic Construction (Pre-CD-1) .....	.....	84,787	84,787	+ 84,787	.....
Subtotal, Recapitalization	582,998	903,904	903,904	+ 320,906	.....
I&O Construction:					
Programmatic Construction					
06-D-141 Uranium Processing Facility, Y-12	745,000	750,000	750,000	+ 5,000	.....

07-D-220-04 TRU Liquid Waste Facility, LANL	36,687	36,687	+ 36,687	.....
15-D-301 HE Science & Engineering Facility, PX	43,000	43,000	- 37,000	.....
15-D-302 TA-55 Reinvestment project III, LANL	30,000	30,000	+ 30,000	.....
17-D-640 U1a complex enhancements project, NNSA	160,600	160,600	+ 125,600	.....
18-D-620 Exascale Computing Facility Modernization Project, LLNL	29,200	29,200	- 20,800	.....
18-D-650 Tritium Finishing Facility, SRS	27,000	27,000	.....	.....
18-D-690, Lithium processing facility, Y-12	109,405	109,405	+ 77,405	.....
21-D-510 HE Synthesis, Formulation, and Production, PX	31,000	31,000	+ 31,000	.....
Chemistry and Metallurgy Replacement (CMRR):				
04-D-125 Chemistry and metallurgy replacement project, LANL	168,444	169,427	+ 983	.....
Subtotal, Programmatic Construction and CMMR	1,137,444	1,386,319	+ 248,875	.....
Mission Enabling				
15-D-611 Emergency Operations Center, SNL	4,000	36,000	+ 32,000	.....
15-D-612 Emergency Operations Center, LLNL	5,000	27,000	+ 22,000	.....
19-D-670 138KV Power Transmission System Replacement, NNSA	6,000	59,000	+ 53,000	.....
Subtotal, Mission Enabling	15,000	122,000	+ 107,000	.....
Subtotal, I&O Construction:	1,152,444	1,508,319	+ 355,875	.....
Subtotal, Infrastructure and Operations	3,201,442	4,347,005	+ 1,145,563	- 36,572
Secure Transportation Asset:				
STA Operations and Equipment	185,000	266,390	+ 81,390	.....
Program Direction	107,660	123,684	+ 16,024	.....
Subtotal, Secure Transportation Asset	292,660	390,074	+ 97,414	.....
Defense Nuclear Security:				
Defense Nuclear Security (DNS)	750,000	800,895	+ 50,895	- 15,000
Construction:				
17-D-710 West End Protected Area Reduction Project, Y-12	25,000	26,000	+ 1,000	+ 15,000
Subtotal, Defense Nuclear Security	775,000	826,895	+ 51,895	.....
Subtotal, Defense Nuclear Security (DNS)	775,000	826,895	+ 51,895	.....
Information Technology and Cyber Security	300,000	375,511	+ 75,511	.....
Legacy Contractor Pensions (WPA)	91,200	101,668	+ 10,468	.....

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Subtotal, Weapons Activities	12,457,097	15,602,000	15,602,000	+ 3,144,903	.....
TOTAL, WEAPONS ACTIVITIES	12,457,097	15,602,000	15,602,000	+ 3,144,903	.....
DEFENSE NUCLEAR NONPROLIFERATION					
Defense Nuclear Nonproliferation Programs:					
Material Management and Minimization:					
Conversion	99,000	170,000	105,000	+ 6,000	— 65,000
Nuclear Material Removal	32,925	40,000	40,000	+ 7,075	.....
Material Disposition	186,608	190,711	190,711	+ 4,103	.....
Laboratory and Partnership Support	45,000	.....	60,000	+ 15,000	+ 60,000
Uranium Reserve Program .....	.....	.....	30,000	+ 30,000	+ 30,000
Subtotal, Material Management and Minimization	363,533	400,711	425,711	+ 62,178	+ 25,000
Global Material Security:					
International Nuclear Security	58,000	66,391	58,000	.....	— 8,391
Domestic Radiologic Security	147,002	101,000	147,002	.....	+ 46,002
International Radiologic Security	78,907	73,340	78,907	.....	+ 5,567
Nuclear Smuggling Detection and Deterrence	159,000	159,749	159,749	+ 749	.....
Subtotal, Global Material Security	442,909	400,480	443,658	+ 749	+ 43,178
Nonproliferation and Arms Control:					
National Technical Nuclear Forensics R&D	140,000	138,708	140,000	.....	+ 1,292
.....	.....	40,000	20,000	+ 20,000	— 20,000
Defense Nuclear Nonproliferation R&D:	299,046	235,220	255,220	— 43,826	+ 20,000
Proliferation Detection	196,617	236,531	236,531	+ 39,914	.....
Nuclear Detonation Detection	15,000	.....	15,000	.....	+ 15,000
Nonproliferation Fuels Development	22,500	59,900	59,900	+ 37,400	.....
Nonproliferation Stewardship Program .....	.....	.....	.....	.....	.....
Subtotal, Defense Nuclear Nonproliferation R&D	533,163	531,651	566,651	+ 33,488	+ 35,000

Nonproliferation Construction:					
99-D-143 Mixed Oxide (MOX) Fuel Fabrication Facility, SRS	220,000	148,589	148,589	-220,000	
18-D-150 Surplus Plutonium Disposition Project, SRS	79,000			+69,589	
Subtotal, Nonproliferation Construction	299,000	148,589	148,589	-150,411	
Nuclear Counterterrorism and Incident Response:					
Emergency Operations	35,545	36,000	36,000	+455	
Counterterrorism and Counterproliferation	336,550	341,513	321,513	-15,037	-20,000
Subtotal, Nuclear counterterrorism and incident response	372,095	377,513	357,513	-14,582	-20,000
Legacy contractor pensions	13,700	14,348	14,348	+648	
Use of prior-year balances		-21,000	-21,470	-21,470	-470
TOTAL, DEFENSE NUCLEAR NONPROLIFERATION	2,164,400	2,031,000	2,095,000	-69,400	+64,000
NAVAL REACTORS					
Naval Reactors Development	516,205	590,306	545,000	+28,795	-45,306
Columbia-class Reactor Systems Development	75,500	64,700	64,700	-10,800	
S8G Prototype Refueling	170,000	135,000	135,000	-35,000	
Naval Reactors Operations and Infrastructure	553,591	506,294	553,600	+9	+47,306
Program Direction	50,500	53,700	51,700	+1,200	-2,000
Construction:					
14-D-901 Spent Fuel Handling Recapitalization project, NRF	238,000	330,000	330,000	+92,000	
19-D-930 KS Overhead Piping	20,900			-20,900	
20-D-931, KL Fuel Development Laboratory	23,700			-23,700	
21-D-530 KL Steam and Condensate Upgrades		4,000	4,000	+4,000	
Subtotal, Construction	282,600	334,000	334,000	+51,400	
TOTAL, NAVAL REACTORS	1,648,396	1,684,000	1,684,000	+35,604	
FEDERAL SALARIES AND EXPENSES	434,699	454,000	443,200	+8,501	-10,800
TOTAL, NATIONAL NUCLEAR SECURITY ADMINISTRATION	16,704,592	19,771,000	19,824,200	+3,119,608	+53,200
Closure Sites Administration	4,987	4,987	4,987		
DEFENSE ENVIRONMENTAL CLEANUP					

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Richland:					
River Corridor and Other Cleanup Operations	236,102	54,949	236,100	-2	+ 181,151
Central Plateau Remediation	654,800	498,335	664,800	+ 10,000	+ 166,465
RL Community and Regulatory Support	10,121	2,500	10,200	+ 79	+ 7,700
Construction:					
18-D-404 WESF Modifications and Capsule Storage	11,000	.....	15,000	+ 4,000	+ 15,000
Subtotal, Construction	11,000	.....	15,000	+ 4,000	+ 15,000
Subtotal, Richland	912,023	555,784	926,100	+ 14,077	+ 370,316
Office of River Protection:					
Waste Treatment and Immobilization Plant Commissioning	15,000	50,000	50,000	+ 35,000	.....
Rad Liquid Tank Waste Stabilization and Disposition	775,000	597,757	775,000	.....	+ 177,243
Construction:					
01-D-16 D High-level Waste Facility	25,000	.....	50,000	+ 25,000	+ 50,000
01-D-16 E Pretreatment Facility	15,000	.....	.....	- 15,000	.....
18-D-16 Waste Treatment and Immobilization Plant—LBL/Direct Feed LAW	775,000	609,924	770,000	- 6,000	+ 160,076
Subtotal, Construction	815,000	609,924	820,000	+ 4,000	+ 210,076
ORP Low-level Waste Offsite Disposal	10,000	.....	.....	- 10,000	.....
Subtotal, Office of River Protection	1,616,000	1,257,681	1,645,000	+ 29,000	+ 387,319
Idaho National Laboratory:					
Idaho Cleanup and Waste Disposition	430,000	257,554	400,000	- 30,000	+ 142,446
Idaho Community and Regulatory Support	3,500	2,400	3,500	.....	+ 1,100
Total, Idaho National Laboratory	433,500	259,954	403,500	- 30,000	+ 143,546
NNSA Sites and Nevada Offsites:					
Lawrence Livermore National Laboratory	1,727	1,764	1,764	+ 37	.....

Separations Process Research Unit	15,000	15,000	15,000	15,000	— 300	.....
Nevada	60,737	60,737	60,737	60,737	.....	.....
Sandia National Laboratory	2,652	4,860	4,860	4,860	+ 2,208	.....
Los Alamos National Laboratory	220,000	120,000	220,000	220,000	+ 100,000	.....
LLNL Excess Facilities D&D	65,000	.....	35,000	35,000	+ 35,000	.....
Total, MNSA Sites and Nevada Off-sites	365,416	202,361	337,361	337,361	+ 135,000	.....
Oak Ridge Reservation:						
OR Nuclear Facility D&D	213,000	109,077	232,723	232,723	+ 19,723	+ 123,646
U233 Disposition Program	55,000	45,000	55,000	55,000	+ 10,000	.....
OR Cleanup and disposition	101,100	58,000	133,880	133,880	+ 32,780	+ 75,880
Construction:						
14-D-403 Outfall 200 Mercury Treatment Facility	70,000	20,500	20,500	20,500	- 49,500	.....
17-D-401 On-site Waste Disposal Facility	.....	22,380	22,380	22,380	+ 22,380	.....
Subtotal, Construction	70,000	42,880	42,880	42,880	- 27,120	.....
OR Community & Regulatory Support	5,900	4,930	5,900	5,900	+ 970	.....
OR Technology Development and Deployment	5,000	3,000	5,000	5,000	+ 2,000	.....
Total, Oak Ridge Reservation	450,000	262,887	475,383	475,383	+ 25,383	+ 212,496
Savannah River Site:						
SR Site Risk Management Operations:						
SR Site Risk Management Operations	506,366	455,122	455,122	455,122	- 51,244	.....
Construction:						
18-D-402 Emergency Operations Center Replacement, SR	6,792	.....	.....	.....	- 6,792	.....
Total, SR Site Risk Management Operations	513,158	455,122	455,122	455,122	- 58,036	.....
SR Community and Regulatory Support	11,249	4,989	11,249	11,249	+ 6,260	.....
SR Radioactive Liquid Tank Waste Stabilization and Disposition	820,106	970,332	964,072	964,072	+ 143,966	.....
Construction:						
05-D-405 Salt Waste Processing Facility, SRS	21,200	.....	.....	.....	- 21,200	.....
17-D-402 Saltstone Disposal Unit #7, SRS	40,034	10,716	10,716	10,716	- 29,318	.....
18-D-402 Saltstone Disposal unit #8/9	20,000	65,500	65,500	65,500	+ 45,500	.....
19-D-701 SR Security System Replacement	4,525	.....	.....	.....	- 4,525	.....
20-D-401 Saltstone Disposal Unit #10, 11, 12	500	.....	.....	.....	- 500	.....
20-D-402 Advanced Manufacturing Collaborative Facility (AMC)	25,000	25,000	25,000	25,000	.....	.....

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Subtotal, Construction	111,259	101,216	101,216	- 10,043	.....
Total, Savannah River Site	1,455,772	1,531,659	1,531,659	+ 75,887	.....
Waste Isolation Pilot Plant:					
Waste Isolation Pilot Plant	294,353	323,260	323,260	+ 28,907	.....
Construction:					
15-D-411 Safety Significant Confinement Ventilation System, WIPP	58,054	.....	.....	- 58,054	.....
15-D-412 Exhaust Shaft, WIPP	44,500	50,000	50,000	+ 5,500	.....
21-D-401 Hoisting Capability Project .....	.....	10,000	10,000	+ 10,000	.....
Total, Waste Isolation Pilot Plant	396,907	383,260	383,260	- 13,647	.....
Program Direction	281,119	275,285	289,000	+ 7,881	+ 13,715
Program Support	12,979	12,979	12,979	.....	.....
Safeguards and Security	313,097	320,771	320,771	+ 7,674	.....
Technology Development	25,000	25,000	30,000	+ 5,000	+ 5,000
Use of Prior-Year Balances	- 11,800	.....	.....	+ 11,800	.....
Subtotal, Defense Environmental Cleanup	6,255,000	5,092,608	6,360,000	+ 105,000	+ 1,267,392
Rescission .....	.....	- 109,000	.....	.....	+ 109,000
TOTAL, DEFENSE ENVIRONMENTAL CLEANUP	6,255,000	4,983,608	6,360,000	+ 105,000	+ 1,376,392
OTHER DEFENSE ACTIVITIES					
Environment, Health, Safety and Security:					
Environment, Health, Safety and Security	136,839	134,320	134,000	- 2,839	- 320
Program Direction—Environment, Health, Safety and Security	71,000	75,368	71,000	.....	- 4,368
Subtotal, Environment, Health, safety and security	207,839	209,688	205,000	- 2,839	- 4,688

Enterprise Assessments:						
Enterprise Assessments	24,068	26,949	25,000	+ 932	-1,949	
Program Direction	54,711	54,635	54,635	- 76		
Subtotal, Enterprise Assessments	78,779	81,584	79,635	+ 856	-1,949	
Specialized security activities						
Office of Legacy Management:	273,409	258,411	270,000	- 3,409	+ 11,589	
Legacy Management Activities—Defense	142,767	293,873	143,873	+ 1,106	- 150,000	
Program Direction—Legacy Management	19,262	23,120	19,441	+ 179	- 3,679	
Subtotal, Office of Legacy Management	162,029	316,993	163,314	+ 1,285	- 153,679	
Defense Related Administrative Support	179,092	183,789	183,789	+ 4,697		
Office of Hearings and Appeals	4,852	4,262	4,262	- 590		
TOTAL, OTHER DEFENSE ACTIVITIES	906,000	1,054,727	906,000		- 148,727	
TOTAL, ATOMIC ENERGY DEFENSE ACTIVITIES	23,865,592	25,809,335	27,090,200	+ 3,224,608	+ 1,280,865	
POWER MARKETING ADMINISTRATIONS ¹						
SOUTHEASTERN POWER ADMINISTRATION						
Operation and Maintenance	70,704	85,401	66,163	- 4,541	- 19,238	
Purchase Power and Wheeling	6,597	11,246	11,246	+ 4,649		
Subtotal, Operation and Maintenance	77,301	96,647	77,409	+ 108	- 19,238	
Less Alternative Financing (for PPW)	- 14,704	- 14,163	- 14,163	+ 541		
Less Alternative Financing (for PD)		- 4,000	- 4,000	- 4,000		
Offsetting Collections (for PPW)	- 56,000	- 71,238	- 52,000	+ 4,000	+ 19,238	
Offsetting Collections (for PD)	- 6,597	- 7,246	- 7,246	- 649		
SOUTHWESTERN POWER ADMINISTRATION						
Operation and Maintenance	13,639	13,292	13,292	- 347		
Operation And Maintenance	68,000	95,000	40,000	- 28,000	- 55,000	
Purchase Power And Wheeling	35,157	35,635	35,635	+ 478		
Program Direction	15,067	13,267	13,267	- 1,800		
Construction						

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Subtotal, Operation and Maintenance	131,863	157,194	102,194	-29,669	-55,000
Less Alternative Financing (for O&M)	-6,018	-5,635	-5,635	+383	.....
Less Alternative Financing (for PPW)	-25,000	-25,000	-25,000	.....	.....
Less Alternative Financing (for Construction)	-10,070	-8,167	-8,167	+1,903	.....
Less Alternative Financing (for PD) .....	.....	-852	-852	-852	.....
Offsetting Collections (for PD)	-31,467	-31,483	-31,483	+16	.....
Offsetting Collections (for O&M)	-5,908	-5,657	-5,657	+251	.....
Offsetting Collections (for PPW)	-43,000	-70,000	-15,000	+28,000	+55,000
TOTAL, SOUTHWESTERN POWER ADMINISTRATION	10,400	10,400	10,400	.....	.....
WESTERN AREA POWER ADMINISTRATION					
Operation and Maintenance:					
Construction And Rehabilitation	45,887	26,251	26,251	-19,636	.....
Operation And Maintenance	72,176	77,874	77,874	+5,698	.....
Purchase Power And Wheeling	515,769	520,933	465,890	-49,879	-55,043
Program Direction	250,091	253,575	253,575	+3,484	.....
Subtotal, Operation and Maintenance	883,923	878,633	823,590	-60,333	-55,043
Less Alternative Financing (for O&M)	-6,600	-6,297	-6,297	+303	.....
Less Alternative Financing (for Construction)	-39,922	-20,353	-20,353	+19,569	.....
Less Alternative Financing (for PD)	-44,719	-48,546	-48,546	-3,827	.....
Less Alternative Financing (for PPW)	-288,769	-293,890	-293,890	-5,121	.....
Offsetting Collections (for PD)	-149,142	-145,010	-145,010	+4,132	.....
Offsetting Collections (for O&M)	-24,445	-24,744	-24,744	-299	.....
Purchase Power & Wheeling Financed from Offsetting (PL 108-447/109-103)	-227,000	-227,043	-172,000	+55,000	+55,043
Offsetting Collections—Colorado River Dam (PL 98-381)	-8,954	-8,378	-8,378	+576	.....
Use of Prior-Year Balances	-5,000	-15,000	-15,000	-10,000	.....
Rescission of Prior-Year Balances	-176	.....	.....	+176	.....

TOTAL, WESTERN AREA POWER ADMINISTRATION	89,196	89,372	89,372	+ 176	.....
FALCON AND AMISTAD OPERATING AND MAINTENANCE FUND						
Falcon And Amistad Operation And Maintenance	5,647	7,302	7,302	+ 1,655	.....
Offsetting Collections—Falcon and Amistad Fund	-2,932	-5,548	-5,548	-2,616	.....
Less Alternative Financing—Falcon and Amistad Fund	-1,187	-1,526	-1,526	-339	.....
Use of Prior-Year Balances	-1,300	.....	.....	+ 1,300	.....
TOTAL, FALCON AND AMISTAD O&M FUND	228	228	228	.....	.....
TOTAL, POWER MARKETING ADMINISTRATIONS	99,824	100,000	100,000	+ 176	.....
FEDERAL ENERGY REGULATORY COMMISSION						
Federal Energy Regulatory Commission	382,000	404,350	404,350	+ 22,350	.....
FERC Revenues	-382,000	-404,350	-404,350	-22,350	.....
GENERAL PROVISIONS						
Energy Programs Rescission	-12,723	.....	.....	+ 12,723	.....
Colorado River Basin Fund (305(b)) .....	.....	.....	2,000	+ 2,000	.....
Total, General Provisions	-12,723	.....	2,000	+ 14,723	.....
GRAND TOTAL DEPARTMENT OF ENERGY	38,586,316	35,729,069	42,039,126	+ 3,452,810	+ 6,310,057	
(Total amount appropriated)	(38,657,215)	(36,563,228)	(42,041,366)	(+ 3,384,151)	(+ 5,478,138)	
(Rescissions)	(- 70,899)	(- 834,159)	(- 2,240)	(+ 68,659)	(+ 831,919)	
SUMMARY OF ACCOUNTS						
Energy Efficiency and Renewable Energy	2,790,000	719,563	2,848,000	+ 58,000	+ 2,128,437	
Cybersecurity, Energy Security, and Emergency Response	156,000	184,621	156,000	.....	- 28,621
Electricity	190,000	195,045	223,000	+ 33,000	+ 27,955	
Nuclear Energy	1,493,408	1,179,931	1,505,300	+ 11,892	+ 325,369	
Uranium Reserve Program .....	.....	150,000	120,000	+ 120,000	- 30,000
Fossil Energy Research and Development	750,000	730,601	750,000	.....	+ 19,399
Naval Petroleum & Oil Shale Reserves	14,000	13,006	13,006	- 994	.....
Strategic Petroleum Reserve	195,000	187,081	187,081	- 7,919	.....
SPR Petroleum Account	10,000	- 68,000	1,000	- 9,000	+ 69,000	
Northeast Home Heating Oil Reserve	10,000	- 84,000	10,000	.....	+ 94,000
Energy Information Administration	126,800	128,710	126,800	.....	- 1,910
Non-Defense Environmental Cleanup	319,200	275,820	326,000	+ 6,800	+ 50,180	

DEPARTMENT OF ENERGY—Continued
[In thousands of dollars]

	2020 appropriations	Budget estimate	Committee recommendation	Committee recommendation compared to—	
				2020 appropriations	Budget estimate
Uranium Enrichment D&D Fund	881,000	806,244	848,000	- 33,000	+ 41,756
Science	7,000,000	5,837,806	7,026,000	+ 26,000	+ 1,188,194
Nuclear Waste Disposal .....	.....	27,500	.....	.....	- 27,500
Advanced Research Projects Agency—Energy	425,000	- 310,744	430,000	+ 5,000	+ 740,744
Title 17 Innovative technology loan guarantee program	29,000	- 384,659	29,000	.....	+ 413,659
Advanced Technology Vehicles Manufacturing Loan Program	5,000	.....	5,000	.....	+ 5,000
Tribal Energy Loan Guarantee program	2,000	- 8,500	2,000	.....	+ 10,500
Office of Indian Energy Policy and Programs	22,000	8,005	22,000	.....	+ 13,995
Departmental administration	161,000	136,094	161,000	.....	+ 24,906
Office of the Inspector General	54,215	57,739	57,739	+ 3,524	.....
International Affairs .....	.....	32,959	.....	.....	- 32,959
Artificial Intelligence and Technology Office .....	.....	4,912	.....	.....	- 4,912
Atomic energy defense activities:					
National Nuclear Security Administration:					
Weapons activities	12,457,097	15,602,000	15,602,000	+ 3,144,903	.....
Defense nuclear nonproliferation	2,164,400	2,031,000	2,095,000	- 69,400	+ 64,000
Naval reactors	1,648,396	1,684,000	1,684,000	+ 35,604	.....
Federal Salaries and Expenses	434,699	454,000	443,200	+ 8,501	- 10,800
Subtotal, National Nuclear Security Admin	16,704,592	19,771,000	19,824,200	+ 3,119,608	+ 53,200
Defense Environmental Cleanup	6,255,000	4,983,608	6,360,000	+ 105,000	+ 1,376,392
Other Defense Activities	906,000	1,054,727	906,000	.....	- 148,727
Total, Atomic Energy Defense Activities	23,865,592	25,809,335	27,090,200	+ 3,224,608	+ 1,280,865
Power Marketing Administrations: 1					
Southwestern Power Administration	10,400	10,400	10,400	.....	.....
Western Area Power Administration	89,196	89,372	89,372	+ 176	.....
Falcon and Amistad Operating and Maintenance Fund	228	228	228	.....	.....
Total, Power Marketing Administrations	99,824	100,000	100,000	+ 176	.....

Federal Energy Regulatory Commission:					
Salaries and Expenses					
Revenues	382,000	404,350	404,350	+ 22,350	.....
	-382,000	-404,350	-404,350	-22,350	.....
General Provisions:					
Energy Programs Rescission	-12,723	.....	.....	+ 12,723	.....
Colorado River Basin Fund (305(b))	2,000	+ 2,000	+ 2,000
Subtotal, General Provisions	-12,723	2,000	+ 14,723	+ 2,000
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Total Summary of Accounts, Department of Energy	38,586,316	35,729,069	42,039,126	+ 3,452,810	+ 6,310,057

† Totals include alternative financing costs, reimbursable agreement funding, and power purchase and wheeling expenditures. Offsetting collection totals reflect funds collected for annual expenses, including power purchase and wheeling.

GENERAL PROVISIONS—DEPARTMENT OF ENERGY

Section 301. The bill includes a provision related to reprogramming.

Section 302. The bill includes a provision to authorize intelligence activities pending enactment of the fiscal year 2021 Intelligence Authorization Act.

Section 303. The bill includes a provision related to high-hazard nuclear facilities.

Section 304. The bill includes a provision regarding the approval of critical decision-2 and critical decision-3 for certain construction projects.

Section 305. The bill includes a provision regarding environmental stewardship and endangered species recovery efforts.

Section 306. The bill includes a provision regarding a pilot program for storage of used nuclear fuel.

Section 307. The bill includes a provision regarding refined petroleum product from the Strategic Petroleum Reserve.