and technical costs. These charges are covered under other appropriations.

ADMINISTRATIVE PROVISION

The bill includes an administrative provision allowing for the purchase of passenger motor vehicles.

GENERAL PROVISIONS—DEPARTMENT OF THE INTERIOR

The bill continues a provision regarding the circumstances in which the Bureau of Reclamation may reprogram funds.

The bill continues a provision regarding the San Luis Unit and Kesterson Reservoir in California.

The bill contains a provision regarding the Secure Water Act of 2009.

The bill contains a provision regarding the CALFED Bay-Delta Authorization Act.

The bill contains a provision regarding the Omnibus Public Land Management Act of 2009.

The bill contains a provision regarding the Reclamation States Emergency Drought Relief Act of 1991.

The bill contains a provision regarding the Reclamation Projects Authorization and Adjustment Act of 1992.

The bill contains a provision prohibiting the use of funds in this Act for certain activities.

TITLE III—DEPARTMENT OF ENERGY

INTRODUCTION

Funds recommended in Title III provide for all Department of Energy (Department) programs, including Energy Efficiency and Renewable Energy; Cybersecurity, Energy Security, and Emergency Response; Electricity; Nuclear Energy; Fossil Energy and Carbon Management; Naval Petroleum and Oil Shale Reserves; Strategic Petroleum Reserve; SPR Petroleum Account; Northeast Home Heating Oil Reserve; Energy Information Administration; Non-Defense Environmental Cleanup; Uranium Enrichment Decontamination and Decommissioning Fund; Science; Nuclear Waste Disposal; Technology Transitions; Clean Energy Demonstrations; Advanced Research Projects Agency—Energy; Title 17 Innovative Technology Loan Guarantee Program; Advanced Technology Vehicles Manufacturing Loan Program; Tribal Energy Loan Guarantee Program; Indian Energy Policy and Programs; Departmental Administration; Office of the Inspector General; National Nuclear Security Administration (Weapons Activities, Defense Nuclear Nonproliferation, Naval Reactors, and Federal Salaries and Expenses); Defense Environmental Cleanup; Defense Uranium Enrichment Decontamination and Decommissioning; Other Defense Activities; Power Marketing Administrations; and Federal Energy Regulatory Commission.

COMMITTEE RECOMMENDATION

The Department of Energy has requested a total budget of $46,646,300,000 in fiscal year 2022 to fund programs in its four

primary mission areas: science, energy, environment, and national security. The recommendation provides $45,126,500,000 for the Department of Energy, $3,201,475,000 above fiscal year 2021 amounts.

The Committee's recommendations for Department of Energy programs in fiscal year 2022 are described in the following sections. A detailed funding table is included at the end of this title.

CONGRESSIONAL DIRECTION

Article 1, section 9 of the United States Constitution states, "No money shall be drawn from the Treasury but in consequence of Appropriations made by law."

The Committee continues to include the Department's reprogramming authority in statute to ensure that the Department carries out its programs consistent with congressional direction. This reprogramming authority is established at the program, project, or activity level, whichever is the most specific level of budget items identified in this Act and the Committee report accompanying this Act. The Committee also prohibits new starts through the use of reprogramming and includes other direction to improve public oversight of the Department's actions. In addition, the recommendation continues to include a general provision specifying which transfer authorities may be used for accounts funded by this Act.

The Committee counts on a timely and accessible executive branch in the course of fulfilling its constitutional role in the appropriations process. Requesting and receiving basic, factual information, including budget justification materials and responses to inquiries, is vital in order to ensure transparency and accountability. While some discussions internal to the executive branch may be pre-decisional in nature and therefore not subject to release, the Committee's access to the facts, figures, and statistics that inform the decisions of the executive branch are not subject to those same sensitivities. The Committee shall have ready and timely access to information from the Department, Federally Funded Research and Development Centers, and any recipient of funding from this Act. Further, the Committee appreciates the ability for open and direct communication with all recipients of funding from this Act, and the Department shall not interfere with such communication and shall not penalize recipients of funding from this Act for such communication.

REPROGRAMMING AND TRANSFER GUIDELINES

The Committee requires the Department to inform the Committee promptly when a change in program execution and funding is required during the fiscal year. The Department's reprogramming requirements are detailed in statute. To assist the Department in this effort, the following guidance is provided for programs and activities.

Definition.—A reprogramming includes the reallocation of funds from one activity to another within an appropriation. The recommendation includes a general provision providing internal reprogramming authority to the Department, as long as no program, project, or activity is increased or decreased by more than

$5,000,000 or 10 percent, whichever is less, compared to the levels in the table detailing the Committee's recommendations for the Department's various accounts. For construction projects, a reprogramming constitutes the reallocation of funds from one construction project to another project or a change of $2,000,000 or 10 percent, whichever is less, in the scope of an approved project.

Criteria for Reprogramming.—A reprogramming should be made only when an unforeseen situation arises, and then only if delay of the project or activity until the next fiscal year would result in a detrimental impact to an agency program or priority. A reprogramming may also be considered if the Department can show that significant cost savings can accrue by increasing funding for an activity. Mere convenience or preference shall not be a factor for consideration. A reprogramming may not be employed to initiate new programs or to change program, project, or activity allocations specifically denied, limited, or increased by the Congress in the Act or report.

Reporting and Approval Procedures.—In recognition of the security missions of the Department, the legislative guidelines allow the Secretary and the Administrator of the National Nuclear Security Administration jointly to waive the reprogramming restriction by certifying to the Committee that it is in the nation's security interest to do so. The Department shall not deviate from the levels for activities specified in the report that are below the level of the detail table, except through the regular notification procedures of the Committee. No funds may be added to programs for which funding has been denied. Any reallocation of new or prior-year budget authority or prior-year de-obligations or any request to implement a reorganization that includes moving previous appropriations between appropriations accounts must be submitted to the Committee in writing and shall not be implemented prior to approval by the Committee.

Transfers.—As in fiscal year 2021, funding actions into or out of accounts funded by this Act may only be made by transfer authorities provided by this or other appropriations Acts.

FINANCIAL REPORTING AND MANAGEMENT

The Department is still not in compliance with its statutory requirement to submit to Congress, at the time that the President's budget request is submitted, a future-years energy program that covers the fiscal year of the budget submission and the four succeeding years, as directed in the fiscal year 2012 Act. In addition, the Department has an outstanding requirement to submit a plan to become fully compliant with this requirement. The Department is directed to provide these requirements not later than 30 days after enactment of this Act. The Department may not obligate more than 75 percent of amounts provided to the Chief Financial Officer until the Department submits to the Committee a plan to become fully compliant with this requirement.

Working Capital Fund.—The Department has requested $282,272,000 for the Working Capital Fund for fiscal year 2022. The Committee provides $282,272,000 for this purpose and directs that if the Department transfers additional amounts to the Working Capital Fund, notification must be provided to the Committee

in advance of any such transfer. The notification shall identify the sources of funds by program, project, or activity. Further, the Department shall notify the Committee before adding or removing any activities from the fund.

Public Access Plan.—The Committee appreciates the Department issuing its Public Access Plan on July 24, 2014. The Committee urges the Department to continue efforts toward full implementation of the plan and expects an update on progress to be included in the fiscal year 2023 budget request.

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.

Congressional Reporting Requirements.—The Committee remains concerned by the Department's often lengthy delays in meeting its Congressional reporting requirements. However, the Committee appreciates the Department's effort, led by the Office of the Chief Financial Officer, to establish a tracking mechanism for all Congressional reporting requirements. The Department is directed to provide monthly updates to the Committee on this issue. Further, the Department is directed to provide all Congressionally required reports digitally in addition to traditional correspondence.

SBIR and STTR Programs.—The Department is directed to use the definition of research and development as provided by the Small Business Innovation Development Act of 1982 and Small Business Administration's "SBIR and STTR Program Policy Directive" for the purposes of the Department's SBIR and STTR programs.

Mortgaging Future-Year Awards.—The Committee remains concerned about the Department's practice of making awards dependent on funding from future years' appropriations. The Department is directed to provide to the Committee not later than 30 days after enactment of this Act a briefing on how the Department can better track and provide information about the accounting of future-year awards by control point.

General Plant Projects.—In alignment with the requirements of section 3118(c) of the National Defense Authorization Act for FY2010, the Department is directed to notify the Committee at least 15 days prior to starting any General Plant Project unless the project is directed by this recommendation or explicitly included in the fiscal year 2022 budget request.

Competitive Procedures.—The Department is directed, in alignment with section 989 of the Energy Policy Act of 2005, to use a competitive, merit-based review process in carrying out research, development, demonstration, and deployment activities, to the maximum extent practicable.

WORKFORCE DEVELOPMENT AND DIVERSITY

Workforce Development.—The Committee recognizes the need to ensure that our nation has a ready, capable workforce both for today and the next generation to meet changing energy demands and safeguard our national nuclear security. The Department has

a long history in and unique opportunity of training and supporting the science, technology, engineering, and mathematics workforce. The fiscal year 2020 Act directed the Department to provide a report that includes an inventory of workforce development and readiness programs supported throughout the Department. The inventory was required to include current programs, past programs over the past 10 years, and recommendations for the Department to improve or expand its workforce development efforts. The report was required to include specific recommendations addressing workforce readiness to meet the Department's nuclear security missions. The Committee is still awaiting this report and directs the Department to provide a briefing on the status of this report not later than 15 days after enactment of this Act.

The Department is encouraged to allocate funding 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, including training programs focused on building retrofit, the construction industry, and the electric vehicle industry. The Department is encouraged to continue to work with two-year, community and technical colleges, labor, and nongovernmental and industry consortia to pursue job training programs, including programs focused on displaced fossil fuel workers, that lead to an industry-recognized credential in the energy workforce.

The Committee supports improving the coordination of federal efforts involved in growing and sustaining a robust national security workforce. The Committee recognizes the Department's collaborations with the Department of Defense to address national security priorities including, but not limited to, climate change, electric infrastructure, nuclear energy, and space. The Committee recognizes the Department's individual education and workforce development programs relating to the intersection of national security and energy but encourages interdepartmental coordination on the creation or modification of these programs. The Department is directed to continue participation in the Interagency Working Group on the National Security Workforce to implement the "Revitalizing America's Foreign Policy and National Security Workforce, Institutions, and Partnerships" National Security Memorandum. Further, the Department is directed to participate in efforts led by the Department of Defense in developing a strategy to address national security education and workforce issues.

Workplace Diversity.—The Committee recognizes the importance of workplace diversity at the Department and its national laboratories. Increasing workplace diversity addresses inequity and inequality and drives performance excellence through improvements in creativity, productivity, and inclusivity. The Committee directs the Department to continue to develop and broaden partnerships with minority serving institutions, including Hispanic Serving Institutions, Historically Black Colleges and Universities, Asian and Pacific Islander Serving Institutions, Predominantly Black Institutions, Tribal Colleges and Universities, and other Minority Serving Institutions. The Committee understands that each national laboratory develops its own recruitment and retention strategies and provides those plans to the Department for review. The fiscal year

2020 Act directed the Department to comprehensively evaluate these plans and provide a report to the Committee detailing efforts to recruit and retain diverse talent from the institutions mentioned above. Further, the fiscal year 2020 Act directed the Department to provide to the Committee a report on its internal programs that support research and development opportunities for the institutions mentioned above. The Committee is still awaiting these reports and directs the Department to provide a briefing on the status these reports not later than 30 days after enactment of this Act. Additionally, the Department is directed to provide to the Committee not later than 120 days after enactment of this Act a report on the Department's plan to recruit and retain more African Americans, Hispanic/Latinx, Asian Americans, Native Americans/Alaskan Natives, Pacific Islander/Native Hawaiian, and people with disabilities across all job types, including research and technical positions. This report should also include current workforce numbers with disaggregated data for racial, ethnic, gender, and other underrepresented minorities at all national laboratories and across the Department. The Department is encouraged to consider direct programmatic funding to the national laboratories to support locally developed activities and programs that advance the Department's diversity, equity, and inclusion goals and objectives.

CROSSCUTTING INITIATIVES

Equity and Justice.—The Committee recognizes the importance of establishing a 21st-century clean energy system that will both combat climate change and institute principles of equity and justice in the U.S. energy system. The Committee supports the Department's reforms toward this goal. In order to improve these practices at the Department, the Committee directs the Department to survey its current programs, policies, procedures, and rules to ensure that it is adequately meeting the clean energy, energy conservation, and energy efficiency needs of low-income, minority, and other marginalized communities. Further, the Department is directed to consider social equity, workforce development standards, public health effects, and environmental and energy justice in conducting activities across the Department's programs and to prioritize projects and grantees that advance equity and justice and maximize public health benefits. The Department is directed to improve analytical tools and grantmaking criteria to evaluate the social equity, public health, and environmental and energy justice impacts of technologies and projects and to incorporate these criteria into agency activities. The Department is directed to increase engagement with communities impacted by climate change, air and water pollution, systemic racism and underinvestment, high energy costs, and economic inequality when carrying out this section, designing grant programs, and conducting activities across the Department's programs. The Department is directed to provide funding to state, local, and tribal government entities, community organizations, businesses, universities, and other entities to advance equity and environmental and energy justice while driving innovation and to integrate this funding across the energy programs. The Department is directed to provide to the Committee not later than

90 days after enactment of this Act a report summarizing its efforts and findings in carrying out the direction contained herein.

The Department is directed to contract with the National Academies of Sciences, Engineering, and Medicine to study the technical and non-technical barriers to and solutions for ensuring equitable distribution of the benefits associated with clean energy in environmental justice communities across all sectors of the economy, and in particular the role of the Department in assessing and mitigating such barriers. In this study, the term "environmental justice community" means a community with significant representation of communities of color, low-income communities, or tribal and indigenous communities, that experiences, or is at risk of experiencing, higher or more adverse human health or environmental effects. Environmental justice communities should be part of the development of the study. The study shall: (1) assess the state of research on the equitable distribution of the benefits of clean energy including workforce development, job creation, and public health benefits; (2) identify key indicators and standards to measure equitable and effective allocation of resources; (3) assess the progress in implementing programs and policies that result in increased adoption of clean energy technologies in environmental justice communities; (4) identify barriers as well as potential incentives and mechanisms to achieving the equitable distribution of the benefits associated with clean energy in environmental justice communities, including through the consideration of social, behavioral, regulatory, policy, market, and technology aspects, and considerations of the characteristics of individual communities, such as geographical location, average income, and racial-ethnic composition; (5) identify mechanisms for ensuring the effective participation of environmental justice communities in decision-making about the transition to a clean energy economy; and (6) recommend research areas for the Department to make progress toward ensuring equitable distribution of the benefits associated with clean energy in environmental justice communities.

The Committee supports the Department's continuing efforts and progress in implementing the Justice40 Initiative, the energy justice initiative, and Executive Order 14008.

Energy Storage.—The Committee continues to support the Department's Energy Storage Grand Challenge initiative to build on and coordinate the Department's research, development, demonstration, and deployment efforts in energy storage to accelerate the development, commercialization, and utilization of next generation energy storage technologies. The Department is directed to carry out these activities in accordance with sections 3201 and 3202 of the Energy Act of 2020. The recommendation provides not less than $484,000,000 for energy storage, including not less than $350,000,000 from the Office of Energy Efficiency and Renewable Energy (EERE), not less than $101,000,000 from the Office of Electricity (OE), not less than $5,000,000 from the Office of Fossil Energy and Carbon Management (FECM), not less than $4,000,000 from the Office of Nuclear Energy (NE), and not less than $24,000,000 from the Office of Science.

The Department is directed to support long-duration joint demonstration projects with the Department of Defense and grants for

rural utilities to build microgrids for resiliency. The Department is directed to support competitive pilot demonstration grants, as authorized in section 3201 of the Energy Act of 2020, for energy storage projects that are wholly U.S.-made, sourced, and supplied. The Department is directed to support activities that would also help build a domestic energy storage supply chain that does not depend on foreign sources of critical minerals. The Department is directed to continue to support research and technology development efforts in long-duration energy storage in all its forms, including electrochemical, chemical, 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.

The Committee recognizes the emergence of several new energy storage technologies that can support energy independence in the United States. The Committee directs the Department to publish a report on emerging energy storage technologies. Further, the report shall include an analysis of which technologies show promise for further or future funding. The emergent energy storage technologies explored in this report shall include, but not be limited to, supercapacitors, flow batteries, low-carbon hydrogen storage, and compressed-air energy storage. The Department is directed to provide this report to the Committee not later than 270 days after enactment of this Act.

Critical Minerals.—The modern global economy has increasingly come to depend on access to a number of critical materials that were not widely used or considered essential to manufacturing just a few decades ago. Given that growing dependency, the Committee appreciates the Department's elevation and coordination of critical minerals activities across the Department through the Critical Minerals Initiative. The recommendation provides not less than $152,000,000 for research, development, demonstration, and commercialization activities on the development of alternatives to, recycling of, and efficient production and use of critical minerals, including not less than $100,000,000 from EERE, not less than $35,000,000 from FECM, and not less than $17,000,000 from the Office of Science. The Department is directed to carry out these activities pursuant to sections 7001 and 7002 of the Energy Act of 2020. These activities may be carried out by the Critical Materials Energy Innovation Hub.

The Committee supports the construction of a Critical Materials Supply Chain Research Facility, as authorized by section 7002(h) of the Energy Act of 2020. However, the Committee is concerned about the lack of approval of mission need and the unclear responsibilities among program offices for supporting construction of this facility. The Department is directed to provide to the Committee a report detailing the mission and cost of developing the Critical Materials Supply Chain Research Facility. The report shall include a breakdown of the roles and costs associated with each participating program office. The report shall be provided not later than 30 days after enactment of this Act and prior to the obligation of any funds for the design or construction of the facility.

Industrial Decarbonization.—Industrial processes currently contribute as much as 20 percent of the nation's carbon dioxide emis-

sions. The Committee supports the Department's efforts, aligned with title VI of the Energy Act of 2020, to foster innovations and enable scale up of cost-competitive, low-emissions technologies. The Department is encouraged to supplement research, development, demonstration, and deployment activities with technical assistance and workforce development programs. The recommendation provides not less than $520,000,000 for industrial decarbonization activities, including not less than $250,000,000 from EERE, not less than $250,000,000 from FECM, and not less than $20,000,000 from the Office of Science.

Grid Modernization.—The Department is directed to continue the ongoing work among the national laboratories, industry, and universities to improve grid reliability and resiliency through the strategic goals of the Grid Modernization Initiative (GMI). The Committee recognizes the accomplishments of over 200 partners from industry, academia, and state governments in these efforts. The Department is directed to provide to the Committee not later than 90 days after enactment of this Act a briefing on the revised GMI strategy, plans to reflect new decarbonization targets in strategy enhancements, funding profiles, portfolio of funding opportunities, programmatic investments for the Initiative, and the roles and responsibilities of each participating program office. The Committee directs the Department to continue emphasis on national energy systems resilience within the context of the Administration's goals for decarbonization of the power system and related infrastructures such as transportation. This should build on GMI and Grid Modernization Lab Consortium progress in advanced grid 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 the Committee directs 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.

Recognizing the importance of adaptation of the electric grid to reducing greenhouse gas emissions by accommodating consumer-generated energy, variable generation sources such as wind and solar, and changing demand patterns, including from vehicle electrification, the Department is directed to prioritize implementation of grid modernization programs.

Integrated Energy Systems.—The Committee supports the integrated energy systems activities of EERE, FECM, and NE with the purposes of maximizing energy production and efficiency; developing energy systems involving the integration of nuclear energy with renewable energy, fossil energy, and energy storage; and expanding the use of emissions-reducing energy technologies into nonelectric sectors to achieve significant reductions in environmental emissions. The Department is directed to coordinate all integrated energy systems activities across FECM, NE, EERE, and any other relevant program office. The fiscal year 2021 Act directed

the Department to submit a report that details a potential research agenda of integrated energy systems activities, including estimated funding levels for those activities and the roles and responsibilities of each participating program office. The Committee is still awaiting this report and directs the Department to provide the report not later than 30 days after enactment of this Act.

Carbon Dioxide Removal.—Carbon dioxide removal technologies, also referred to as negative emissions technologies, aim to remove and sequester excess carbon from the atmosphere, and these technologies have been identified as an important part of the portfolio of responses to climate change. The fiscal year 2020 Act directed the Department to develop an implementation plan coordinated across FECM, EERE, and the Office of Science. The Committee is still awaiting this plan and directs the Department to provide the plan not later than 15 days after enactment of this Act. The Department is directed to include a breakdown of the roles and responsibilities of each participating program office in the implementation plan.

The recommendation provides not less than $106,000,000 for research, development, and demonstration of carbon dioxide removal technologies, including not less than $20,000,000 from EERE, not less than $51,000,000 from FECM, and not less than $35,000,000 from the Office of Science. Within available funds for carbon dioxide removal, the recommendation provides not less than $75,000,000 for direct air capture. The Department is directed, pursuant to section 5001 and 5002 of the Energy Act of 2020, to establish the Carbon Dioxide Removal Program and Carbon Dioxide Removal Task Force to advance the development and commercialization of carbon dioxide removal, direct air capture, sequestration, and any other relevant technologies on a significant scale. The Department is directed to coordinate these activities among FECM, EERE, and the Office of Science. The Committee supports direct air capture prize competitions and the direct air capture test center. The Department is directed to provide to the Committee not later than 30 days after enactment of this Act the report required by section 5002 of the Energy Act of 2020.

Energy-Water Nexus.—The Committee supports the Department's ongoing efforts, including through the Water Security Grand Challenge, on advancing transformational technology and innovation to meet the global need for safe, secure, and affordable water. The Committee recognizes the impact of water security and availability on energy production and reliability and the growing interconnectedness between energy and water systems. The Department is directed to continue programs that provide technology innovation, modeling and assessment tools, technical support, informed policy, planning tools to inform financing, and workforce development to focus on the energy-water nexus. The Committee supports the Department's use of a diverse portfolio of prizes; competitions; research, development, and demonstration; and other programs. The recommendation provides not less than $70,000,000 for Energy-Water Nexus activities.

The fiscal year 2021 Act directed the Department to submit a report that outlines the activities previously conducted under the Energy-Water Nexus across the Department, which activities have

continued, which activities ended, and an explanation for the termination of each activity that ended. The Committee is still awaiting this report and directs the Department to provide the report to the Committee not later than 30 days after enactment of this Act. The Department is directed to coordinate all Energy-Water Nexus activities across EERE, OE, FECM, NE, Science, and any other relevant program offices.

Emissions Reductions.—Energy production is a principle contributor to U.S. greenhouse gas emissions. The Committee recognizes the urgent necessity of reducing greenhouse gas emissions to mitigate the impacts of global climate change, as well as the centrality of the power sector to that effort and opportunities for research and development of key technologies at the Department. The Department is encouraged to integrate considerations of climate impacts centrally into all aspects of energy planning and funding. The Department is directed to provide to the Committee not later than 180 days after enactment of this Act a report outlining the Department's plans to reduce greenhouse gas emissions in line with the United States' Nationally Determined Contribution under the U.N. Framework Convention on Climate Change.

Hydrogen Energy and Fuel Cell Coordination.—The Department is directed to coordinate its efforts in hydrogen energy and fuel cell technologies across EERE, FECM, NE, OE, the Office of Science, and any other relevant program offices to maximize the effectiveness of investments in hydrogen-related activities.

Harmful Algal Blooms.—When Congress passed the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA), it created a task force intended to coordinate the federal response to harmful algal bloom activities. The Department is not currently listed as a partner in the task force activities, but the Department conducts and possesses key research, management, and supercomputing capabilities that may be of assistance in the fight against harmful algal blooms. The Department is directed to provide to the Committee not later than 120 days after enactment of this Act a report identifying its relevant capabilities and how it is using those capabilities to support key questions posed in managing, controlling, and diagnosing the public response to harmful algal blooms. Further, the Department is encouraged to engage with partner agencies, such as the National Oceanic and Atmospheric Administration, to determine how its capabilities could play a supporting role with the HABHRCA task force.

DOE and USDA Interagency Working Group.—The Committee supports the establishment of the interagency working group to promote energy and develop technologies that will support and advance agricultural communities and domestic manufacturing, as required by the Agriculture Improvement Act of 2018. Both agencies have a unique role in assisting the country integrate alternative fuel and energy efficiency savings throughout our economy. The Committee directs the working group to pursue joint activities related to the research and development of climate-controlled, affordable, deployable, energy- and water-efficient technologies for four-season food production platforms that can serve undernourished regions of the country. Additionally, the Committee directs the working group to pursue joint activities related to the energy efficiency

of other agricultural platforms; water and wastewater treatment; and greenhouse facilities. The Committee encourages collaboration between USDA's Office of Urban Agriculture and Innovative Production, the Agricultural Research Service, and the National Institute of Food and Agriculture, and the various Department's offices, including, but not limited to, the Advanced Manufacturing Office, Solar Energy Technology Office, Biofuels Technologies Office, Fossil Energy and Carbon Management, Advanced Research Projects Agency—Energy, and Office of Science. The Department is directed to provide to the Committee regular updates on the goals, benchmarks, and progress in implementation of the working group and collaborations. Further, the Department is directed to provide to the Committee not later than 30 days after enactment of this Act a briefing explaining the Department's research agenda relating to promoting energy efficiency for industrial processes, lighting systems, the utilization of advanced soil science, reuse of plant residue materials, materials science, capture of carbon dioxide, and energy efficiency at agricultural production platforms.

The Commonwealth of Puerto Rico and the U.S. Virgin Islands.—The Department is directed to offer technical and other programmatic assistance to the Commonwealth of Puerto Rico for the assessment and implementation of innovative technologies with the capability of combining different infrastructure systems in an integrated manner to effectively mitigate power plant emissions, efficiently treat and reuse wastewater, produce biofuels, and generate power from solid waste. In addition, the Department is directed to offer technical and other programmatic assistance to the Commonwealth of Puerto Rico and the U.S. Virgin Islands in assessing the effectiveness of renewable energy technologies, such as solar and wind, for the territories; power grid feasibility, including repairs, improvements, and modernization; mitigation of storm damages through resilient electric power grids; and microgrid innovation. The Department is directed to provide to the Committee not later than 90 days after enactment of this Act a briefing on the status of, and future plans for, these efforts.

Civilian Climate Corps.—The Department is directed to coordinate with the Department of the Interior and Department of Agriculture on implementation of a Civilian Climate Corps. The Department has capabilities that could contribute to the new Civilian Climate Corps in assisting communities in need and communities interested in transitioning to the green energy economy. The Department is directed to provide to the Committee not later than 30 days after enactment of this Act a briefing on its coordination with the Department of the Interior and Department of Agriculture to ensure the Department's capabilities, technology development, and technical assistance can be utilized by the Civilian Climate Corps. The Department is directed to identify what steps it can take to ensure that its deployment programs inspire a new generation of conservationists and adoption of clean energy technologies.

Landfill Emissions.—The Department, through EERE and FECM and in coordination with the U.S. Environmental Protection Agency, is directed to provide to the Committee not later than 120 days after enactment of this Act a report describing the opportunities and challenges for technologies that capture greenhouse gases,

including methane, from municipal landfills. The report should consider synergies between these technologies and technologies used for carbon capture, utilization, and storage, and the report should include a recommendation for better utilizing and preventing greenhouse gas emissions from landfills.

Variable Buoyancy Aircraft.—The Committee notes that variable buoyancy aircraft may allow for direct factory-to-site transportation of energy products, such as transformers, grid modules, transmission towers, wind turbine blades, and generators. The Department in coordination with relevant federal agencies, is directed to provide to the Committee not later than 180 days after enactment of this Act a report on the feasibility of developing operation concepts and application system configurations of variable buoyance cargo transportation aircraft with internal-ballast systems. The report should include the benefits, challenges, costs, and proper responsibilities of particular federal agencies and the private sector in developing the operation concepts and application system configurations.

Digital Energy Innovation with Decentralized Technologies.—A growing body of research and real-world examples indicate that public, open-source decentralized technologies, including blockchain technology, may help address existing challenges around access to and usefulness of data generated from energy devices in order to promote numerous innovative digital energy solutions. The Committee notes the promise of these technologies for unlocking the economic potential of energy infrastructure investments happening nationwide in renewable energy, electric vehicles, and distributed energy resources like batteries to ensure these devices can participate seamlessly and reliably across different markets and scenarios. Therefore, the Committee encourages the continued research and investment efforts related to decentralized technologies and their application within the energy sector. The Department is directed to provide to the Committee not later than 270 days after the date of enactment of this Act a report on the Department's research activities related to public, open-source decentralized technologies, including blockchain technology. The report should include, but is not limited to, a discussion of all current research related to decentralized technologies, like blockchain; an outline of research that could be done to better understand and utilize decentralized technologies; recommendations for how to encourage adoption and integration of decentralized technologies within the energy sector; and any other relevant observations or recommendations within the field of decentralized technologies and energy.

COVID–19 Research Delays.—The Committee recognizes the potential impacts and delays in research caused by the effects of the COVID–19 pandemic. The Committee notes that the Department has taken some steps to engage scientific professional societies, universities and colleges, and other federal agencies to obtain up-to-date information on the impacts to institutions and research communities to help inform an open, transparent, and equitable response. However, the Committee is concerned that this response has been uneven across the Department. The Department is encouraged to consider these impacts within the resources available. The Department is directed to provide to the Committee not later

than 60 days after enactment of this Act a report that details the impacts of the COVID–19 pandemic on institutions and research communities. The report shall outline funding and costs associated with the impacts. Further, the Department is encouraged to include funding to address the impacts in future budget requests.

ENERGY PROGRAMS

ENERGY EFFICIENCY AND RENEWABLE ENERGY

Appropriation, 2021	$2,861,760,000
Budget estimate, 2022	4,732,000,000
Recommended, 2022	3,768,000,000
Comparison:	
Appropriation, 2021	+906,240,000
Budget estimate, 2022	−964,000,000

The Office of Energy Efficiency and Renewable Energy (EERE) accelerates the research, development, demonstration, and deployment activities that advance energy efficiency and renewable energy technologies, as well as federal energy assistance programs. Since the early 1970s and in partnership with business, industry, universities, research labs, and stakeholders, EERE has spurred innovation of affordable, renewable energy and energy efficiency technologies critical to combating climate change. EERE remains at the forefront of clean energy innovation, implementing a range of strategies aimed at creating good paying jobs, ensuring the clean energy economy benefits all Americans, saving American families and businesses money, and reducing pollution.

The EERE program is divided into three portfolios: sustainable transportation, renewable energy, and energy efficiency. The sustainable transportation portfolio, which consists of the vehicles, bioenergy, and hydrogen and fuel cell programs, focuses on efforts to decarbonize transportation across all modes to enable greater vehicle electrification, commercially viable hydrogen fuel cell trucks, sustainable aviation fuel from biomass, and lower-pollution options for off-road vehicles, rail, and maritime transport. The renewable energy portfolio, which consists of the solar, wind, water, and geothermal programs, supports efforts to reduce the costs and accelerate the use and integration of renewables to contribute to a reliable, secure, and resilient electric grid. The energy efficiency portfolio, which consists of the advanced manufacturing, buildings, and federal energy assistance programs, develops cost-effective solutions to reduce energy consumption in plants, buildings, and homes.

Additional direction related to Department-wide crosscutting initiatives is provided under the heading Crosscutting Initiatives in the front matter of Department of Energy.

In carrying out deployment activities for energy efficiency improvements, energy demand savings, use of renewable energy, and other innovative energy technologies to reach climate mitigation goals, the Department is encouraged to prioritize projects at the local and regional level that use a cooperative model of development, such as Energy Improvement Districts, to encourage coordination between public authorities, energy providers, property owners, and citizens.

view of cancer rates in Pike and surrounding counties is warranted.

SCIENCE

Appropriation, 2021	$7,026,000,000
Budget estimate, 2022	7,440,000,000
Recommended, 2022	7,320,000,000
Comparison:	
Appropriation, 2021	+294,000,000
Budget estimate, 2022	−120,000,000

The Office of Science funds basic science research across national laboratories, universities, and other research institutions in support of American innovation and the Department's energy-focused missions. Through research in physics, biology, chemistry, and other science disciplines, these activities expand scientific understanding and secure the nation's leadership in energy innovation. This basic science research is crucial to enabling the nation to continue developing transformational energy technologies and to position itself to seize economic opportunities in the global energy markets of the future. The Office of Science is the nation's largest supporter of basic research in the physical sciences.

The Office of Science includes the following programs: Advanced Scientific Computing Research; Basic Energy Sciences; Biological and Environmental Research: Fusion Energy Sciences; High Energy Physics; Nuclear Physics; Isotope R&D and Production; Accelerator R&D and Production; Workforce Development for Teachers and Scientists; Science Laboratories Infrastructure; Safeguards and Security; and Program Direction. The Committee has placed a high priority on funding these activities in fiscal year 2022, given the private sector is not likely to fund research whose findings either have high non-commercial value or are not likely to be commercialized in the near or medium term. This work is vital to sustaining the scientific leadership of the United States and can provide the underpinnings for valuable intellectual property in the coming decades.

Additional direction related to Department-wide crosscutting initiatives is provided under the heading Crosscutting Initiatives in front matter for the Department of Energy.

Artificial Intelligence and Machine Learning.—The recommendation includes not less than $115,000,000 for Artificial Intelligence and Machine Learning. As the stewards of the leadership computing facilities, the Committee encourages Advanced Scientific Computing Research to play a lead role in the Department's artificial intelligence and machine learning activities.

Biomedical Sciences.—Collaborative research efforts between the Department and the National Institutes of Health (NIH), including the National Institute of Mental Health (NIMH), are developing breakthroughs in health research, including drug discovery, brain research, innovative neurotechnologies, diagnostic technologies, and other biomedical research areas. The Department is encouraged to expand its relationships with NIH, including NIMH, to work together more strategically to leverage the Department's research capabilities, including instrumentation, materials, modeling and simulation, and data science. The facilities and equipment funded in

this Act support applications in many areas of biomedical research. Better coordination between the Department and NIH could be instrumental in assisting to develop the nation's health, security, and technologies with novel biomedical application. The recommendation includes not less than $2,000,000 for collaboration with NIH within the Department's data and computational mission space.

Quantum Information Sciences.—The Committee supports the Office of Science's coordinated and focused research program in quantum information science and technology. This emerging field of science promises to yield revolutionary new approaches to computing, sensing, and communication. The recommendation provides not less than $245,000,000 for quantum information science, including not less than $120,000,000 for research and $125,000,000 for the five National Quantum Information Science Research Centers. Within available funding, the Committee encourages the Department to support a quantum internet and communications research program consistent with the Department's "America's Blueprint for the Quantum Internet" strategy. The Department is directed to continue its coordination efforts with the National Science Foundation, other federal agencies, private sector stakeholders, and the user community to promote researcher access to quantum systems, enhance the U.S. quantum research enterprise, develop the U.S. quantum computing industry, and educate the future quantum computing workforce.

The Committee directs the Department to be inclusive of all quantum information science technologies to ensure the research expands all possible research applications. Funded research should be inclusive of quantum technologies, including gate, annealing, topological, photonics, trapped ion, silicon, superconducting, and other viable quantum technologies. The Department is directed to provide to the Committee not later than 90 days after enactment of this Act a report of near-term application developments. The report should outline the breakdown of research funding across the available quantum computing technologies, including gate, annealing, topological, photonics, trapped ion, silicon, superconducting, and other viable quantum technologies.

Traineeships for Underrepresented Communities.—The Committee supports the Department's efforts to diversify the nuclear physics research community by offering research traineeships to underrepresented communities pursuing STEM undergraduate degrees. The Committee encourages the Department to especially recruit undergraduate students from Historically Black Colleges and Universities, Hispanic-Serving Institutions, Tribal Colleges and Universities, and Asian American and Pacific Islander Serving Institutions. The Department is directed to provide to the Committee not less than 90 days after enactment of this Act a briefing on its efforts; data on students' socioeconomic status, race, or ethnicity; and recommendations on how to expand this program across the Office of Science and more broadly across the Department.

Reaching a New Energy Sciences Workforce.—The Committee supports the new Reaching a New Energy Sciences Workforce (RENEW) initiative for targeted efforts to increase participation and retention of underrepresented groups in the Office of Science's research activities. The Department is directed to provide to the

Committee not later than 90 days after enactment of this Act and quarterly thereafter briefings on implementation of this program.

ADVANCED SCIENTIFIC COMPUTING RESEARCH

The Advanced Scientific Computing Research program develops and hosts some of the world's fastest computing and network capabilities to enable science and energy modeling, simulation, and research.

High Performance Computing and Network Facilities.—The recommendation provides not less than $160,000,000 for the Argonne Leadership Computing Facility, $250,000,000 for the Oak Ridge Leadership Computing Facility, and not less than $115,000,000 for the National Energy Research Scientific Computing Center at Lawrence Berkeley National Laboratory. The recommendation includes not less than $90,000,000 to support necessary infrastructure upgrades and operations for ESnet.

Mathematical, Computational, and Computer Sciences Research.—The recommendation provides not less than $250,000,000 for Mathematical, Computational, and Computer Sciences Research, including not less than $15,000,000 for computational sciences workforce programs.

The recommendation includes not less than $15,000,000 and up to $40,000,000 for the development of AI-optimized emerging memory technology for AI-specialized hardware allowing for new computing capabilities tailored to the demands of artificial intelligence systems.

BASIC ENERGY SCIENCES

The Basic Energy Sciences program funds basic research in materials science, chemistry, geoscience, and bioscience. The science breakthroughs in this program enable a broad array of innovation in energy technologies and other industries critical to American economic competitiveness.

Research.—The recommendation provides $130,000,000 for Energy Frontier Research Centers, $25,000,000 for the Experimental Program to Stimulate Competitive Research, $25,000,000 for the Batteries and Energy Storage Innovation Hub, and not less than $20,000,000 and up to $25,000,000 for the Fuels from Sunlight Innovation Hub. The Department is directed to provide to the Committee not later than 90 days after enactment of this Act a plan to recapitalize and modernize needed infrastructure, instrumentation, and capabilities utilized by the Energy Innovation Hubs.

The Committee encourages the Office of Science to work with the Office of Energy Efficiency and Renewable Energy to address the need to quickly scale up efforts to develop cleaner production of hydrogen at lower costs to attract industrial investment.

The recommendation provides not less than $535,000,000 for facilities operations of the nation's light sources, not less than $293,000,000 for facilities operations of the high-flux neutron sources, and not less than $142,000,000 for facilities operations of the Nanoscale Science Research Centers (NSRC).

The recommendation provides not less than $14,300,000 for other project costs, including $4,300,000 for Linac Coherent Light Source-II, $5,000,000 for Advanced Photon Source Upgrade, $3,000,000 for

Linac Coherent Light Source-II HE, and $2,000,000 for Cryomodule Repair & Maintenance Facility. The recommendation includes $15,000,000 for NSRC Recapitalization.

The recommendation includes $15,000,000 for NSLS II Experimental Tools-II. Commissioned in 2014, the NSLS II is currently the nation's most powerful synchrotron x-ray light source. While it was designed to accommodate 60 beamlines, just over half will have been constructed at the completion of NEXT II. The Department is directed to provide to the Committee not later than 120 days after enactment of this Act a plan and timeline for the design and construction of the beamlines necessary to complete the build-out of the NSLS II.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

The Biological and Environmental Research (BER) program supports advances in energy technologies and related science through research into complex biological and environmental systems.

The recommendation includes not less than $390,000,000 for Biological Systems Science and not less than $405,000,000 for Earth and Environmental Systems Sciences.

The recommendation provides up to $5,000,000 to support university research efforts for the design and development of AI-inspired biological robots for a broad set of applications, including environmental remediation, chemical upcycling, energy-relevant biomaterials, and enabling technologies for basic biological sciences. The Department should focus on reducing the time and scaling up the processes required to design, manufacture, and deploy new kinds of biological machines for energy and environmental missions.

The Committee continues to support the prototyping and establishment of fabricated ecosystems, automation, sensors, and computational tools to enable a predictive understanding of soil-plant-microbe interactions across molecular to ecosystem scales. The novel tools and capabilities will accelerate discovery and speed the delivery of solutions to climate change, environmental sustainability, and clean energy. The recommendation provides not less than $6,000,000 for fabricated ecosystems and sensors. Within available funds, the recommendation includes up to $4,000,000 for second generation SmartSoils fabricated ecosystem testbeds, new sensors, and computational tools to enable real-time connectivity between lab-controlled, instrumented SmartSoil testbeds and naturally varying field experiments. Within available funds, the recommendation includes up to $8,000,000 to develop and test novel sensor technologies, procure second generation EcoPOD units, and create the computational and experimental infrastructures necessary to dissect field observations at atomic and molecular levels in fabricated ecosystems.

The Committee supports the Department-wide Designing the Bioeconomy Initiative and directs the Department to develop Artificial Intelligence and Machine Learning tools and Design, Build, Test, Learn systems for the discovery and annotation of genes involved in the biosynthesis of inorganic and organic/inorganic biologically produced materials.

The recommendation provides not less than $100,000,000 for the Bioenergy Research Centers and up to $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 recommendation includes not less than $10,000,000 for the low-dose radiation research program. The Department is directed to complete the required contract agreement with the National Academy of Sciences (NAS) to develop a plan for and to conduct a comprehensive, multi-year independent low-dose radiation research program. The Committee intends for this research plan to include a five-year program implementation outline and funding requirements. The plan shall include recommendations for the Department and other federal agencies, including collaborations with outside organizations. The research plan shall be developed in consultation with other federal agencies and qualified personnel representing industry and public interest stakeholders.

The Committee continues to support the Department's funding for colleges and universities to examine and evaluate earth system models and validate their ability to reproduce earth systems.

The Committee continues to support the Department's investment in observational studies, modeling, and computing to reduce the uncertainty in understanding cloud aerosol effects, and the recommendation includes not less than $15,000,000 and up to $30,000,000 to build upon this research. Within available funds, the Department is directed to support the modernization and acceleration of the Energy, Exascale, and Earth System Model program to improve earth system prediction and climate risk management in the service of U.S. public safety, security, and economic interests, including, in coordination with the Department of Homeland Security, evaluation of the modernization and adaptation of capabilities from the National Infrastructure Simulation and Analysis Center to support climate impacts on infrastructure and communities.

The recommendation includes not less than $100,000,000 for Environmental System Science.

The recommendation includes not less than $30,000,000 to continue the development of observational assets and support associated research on the nation's major land-water interfaces, including the Great Lakes and the Puget Sound, that leverages national laboratories' assets as well as local infrastructure and expertise at universities and other research institutions. The Department is directed to provide to the Committee not later than 120 days after enactment of this Act a ten-year research plan, including annual budget targets and justifications, for this integrated effort. The plan should identify investments in existing and new field sites that further the establishment of a national coastal observation network.

The Committee supports activities to advance AI for Earth System Processes for integrating diverse observations and models, including a focus on extreme hydrology in vulnerable watersheds critical for U.S. water resilience in a changing climate. The Committee supports activities to develop integrated mountainous hydroclimate modeling and observational capabilities. The effort should leverage

activities supported by other federal agencies active in investigating how snow-dominated Upper Colorado mountainous systems are responding to extreme events and gradual warming and the implications for water resilience in the western United States.

Existing scientific and modeling approaches for understanding water-energy systems cannot accurately simulate and predict rapid changes and feedbacks between coupled water and energy systems in an uncertain future where extremes, such as droughts, floods, heat waves, and wildfires, are becoming more frequent, intense, and widespread. The Department is directed to support Regional Data, Modeling, and Analysis Test Beds targeted to universities with research competencies in water scarcity issues in dry regions of the United States.

The Department is directed to give priority to optimizing the operation of BER user facilities and encouraged to examine needs for additional capabilities at its existing user facilities.

FUSION ENERGY SCIENCES

The Fusion Energy Sciences program supports basic research and experimentation aiming to harness nuclear fusion for energy production.

The Committee appreciates the fusion community's process to develop a comprehensive long-range strategic plan developed through a consensus process. The Committee directs the Department to follow and embrace the recommendations of the Fusion Energy Sciences Advisory Committee's "Powering the Future: Fusion and Plasmas" report, and the Committee endeavors to provide funding that reflects the prioritization developed through the community's consensus process. The Department is directed to provide to the Committee not later than 90 days after enactment of this Act a briefing on how the Department is aligning its Fusion Energy Sciences program with the recommendations of the "Powering the Future: Fusion and Plasmas" report.

Research.—The recommendation provides not less than $20,000,000 for High Energy Density Laboratory Plasmas, including activities for LaserNetUS; not less than $59,000,000 for NSTX–U Operations; and not less than $33,000,000 for NSTX–U Research.

The recommendation includes up to $45,000,000 for the Milestone-Based Development Program as authorized in section 2008 of the Energy Act of 2020. The Department is directed to support these activities at a level commensurate with the prioritization recommended in the "Powering the Future: Fusion and Plasmas" report. The Department is directed to provide to the Committee not later than 90 days after enactment of this Act a briefing on how the authorities provided in the Milestone-Based Development Program can be applied to the prioritized activities recommended in the "Powering the Future: Fusion and Plasmas" report.

The Committee notes the long-range plan includes consideration of the development of a stellarator facility, and the Department is directed to support these activities at a level commensurate with the prioritization in the "Powering the Future: Fusion and Plasmas" report developed through the community's consensus process

and to conduct these activities in conjunction with university-led teams as appropriate.

The recommendation provides not less than $25,000,000 for the Materials Plasma Exposure experiment.

Construction.—The Committee recommends $242,000,000 for the U.S. contribution to the ITER project, of which not less than $80,000,000 is for in-cash contributions. The Committee continues to believe the ITER project represents an important step forward for energy sciences and has the potential to revolutionize the current understanding of fusion energy. The fiscal year 2021 Act directed the Department to provide to the Committee the performance baseline for the entire project, including an updated baseline for Subproject 1 and a baseline for Subproject 2. The Committee is still awaiting this information, and the Department is directed to provide this information not later than 30 days after enactment of this Act.

The Committee provides funding for the Matter in Extreme Conditions Upgrade at a level commensurate with the prioritization in the "Powering the Future: Fusion and Plasmas" report developed through the community's consensus process.

HIGH ENERGY PHYSICS

The High Energy Physics program supports fundamental research into the elementary constituents of matter and energy and ultimately into the nature of space and time. The program focuses on particle physics theory and experimentation in three areas: the energy frontier, which investigates new particles and fundamental forces through high-energy experimentation; the intensity frontier, which focuses on rare events to better understand our fundamental model of the universe's elementary constituents; and the cosmic frontier, which investigates the nature of the universe and its form of matter and energy on cosmic scales.

Research.—The recommendation provides not less than $30,000,000 for the Sanford Underground Research Facility and not less than $20,000,000 for Cosmic Microwave Background-Stage 4.

The Committee strongly encourages the Department to maintain a balanced portfolio of small-, medium-, and large-scale experiments and to ensure adequate funding for research performed at universities and the national laboratories. The Committee encourages the Department to fund facility operations at levels for optimal operations.

NUCLEAR PHYSICS

The Nuclear Physics program supports basic research into the fundamental particles that compose nuclear matter, how they interact, and how they combine to form the different types of matter observed in the universe today.

Research.—The Department is directed to give priority to optimizing operations for all Nuclear Physics user facilities.

The recommendation provides up to $12,500,000 for the Gamma-Ray Energy Tracking Array, up to $13,000,000 for the High Rigidity Spectrometer, and up to $16,200,000 for MOLLER.

ISOTOPE R&D AND PRODUCTION

Isotope R&D and Production ensures robust supply chains of critical radioactive and stable isotopes for the nation that no domestic entity has the infrastructure or core competency to produce. The Committee supports the FRIB Isotope Harvesting projects.

ACCELERATOR R&D AND PRODUCTION

Accelerator R&D and Production supports cross-cutting research and development in accelerator science and technology, access to unique Office of Science accelerator research and development infrastructure, workforce development, and public-private partnerships to advance new technologies for use in the Office of Science's scientific facilities and in commercial products.

WORKFORCE DEVELOPMENT FOR TEACHERS AND SCIENTISTS

The Workforce Development for Teachers and Scientists program ensures that the nation has the sustained pipeline of science, technology, engineering, and mathematics (STEM) workers to meet national goals and objectives.

The Committee recommends $35,000,000 for Workforce Development for Teachers and Scientists.

The Committee encourages the Department, in collaboration with the national laboratories, to support engagement with high schools locally and across the nation through impactful interactions with national laboratory employees, work-based learning, experiential activities, and emerging technology programs. In support of the Department's and national laboratories' diversity goals, these pre-college programs should address the specific needs of each laboratories' regional community. Programs should directly support and prioritize participation from underrepresented racial and ethnic groups in STEM and people with disabilities. The programs may also address gaps in educational programming and opportunities for students in under resourced and rural school districts.

Further, the Department is directed to submit to the Committee not later than 120 days after enactment of this Act a plan describing a five-year educational and workforce development program for expanding engagement with and support for high school, undergraduate, and graduate students as well as recent graduates, teachers, and faculty in STEM fields. This plan may include paid internships, fellowships, temporary employment, training programs, visiting student and faculty programs, sabbaticals, and research support. The plan shall also include an outreach strategy to more effectively advertise, recruit, and promote educational and workforce programs to community colleges, Minority Serving Institutions, and non-research universities.

SCIENCE LABORATORIES INFRASTRUCTURE

The Science Laboratories Infrastructure program sustains mission-ready infrastructure and safe and environmentally responsible operations by providing the infrastructure improvements necessary to support leading edge research by the Department's national laboratories.

The fiscal year 2021 Act directed the Department to submit to the Committee a report on the funding levels required for operations and maintenance of Oak Ridge National Laboratory nuclear facilities. The Committee is still awaiting this report and directs the Department to provide the report not later than 15 days after enactment of this Act.

NUCLEAR WASTE DISPOSAL

Appropriation, 2021	$27,500,000
Budget estimate, 2022	7,500,000
Recommended, 2022	27,500,000
Comparison:	
Appropriation, 2021	– – –
Budget estimate, 2022	+20,000,000

The recommendation includes $27,5000,000 for Nuclear Waste Disposal, of which $20,000,000 is for interim storage and $7,500,000 is for Nuclear Waste Fund (NWF) oversight activities. Funds for NWF oversight activities are derived from the NWF.

The Department is directed to move forward under existing authority to identify a site for a federal interim storage facility. The Department is further directed to use a consent-based approach when undertaking these activities. The Department is reminded that the Nuclear Waste Policy Act provides for a wide variety of activities that may take place prior to the limitation in that Act.

The Committee also notes that spent nuclear fuel is in many cases located near Indian reservations and cities. As the Department moves forward with planning for an integrated system for the nation's spent nuclear fuel, the Committee encourages the Department to include planning for the removal of spent nuclear fuel from sites located near Indian reservations and cities.

TECHNOLOGY TRANSITIONS

Appropriation, 2021	$– – –
Budget estimate, 2022	19,470,000
Recommended, 2022	19,470,000
Comparison:	
Appropriation, 2021	+19,470,000
Budget estimate, 2022	– – –

The budget request proposes a separate appropriation for the Office of Technology Transitions (OTT). The mission of OTT is to expand the commercial and public impact of the research investments of the Department, and OTT enhances the public return on investment in the Department's technology portfolio, including the national laboratories, through a suite of outcome-oriented activities that enable climate change mitigation, job creation, and commercialization of technologies developed by the Department.

The Committee supports funding OTT through a new, separate appropriation to increase transparency and reflect the need for multi-year funding for programmatic activities.

The recommendation provides not less than $5,000,000 for a competitive funding opportunity for incubators supporting energy innovation clusters. These incubators should have the support of state, regional, and local entities. The Department is directed to provide to the Committee not later than 120 days after obligation of these funds a report on the impact incubators have on job creation and

DEPARTMENT OF ENERGY
(Amounts in thousands)

	FY 2021 Enacted	FY 2022 Request	Bill	Bill vs. Enacted	Bill vs. Request
Portsmouth:					
Nuclear Facility D&D, Portsmouth	367,193	397,311	397,311	+30,118	---
Construction:					
15-U-408 On-site Waste Disposal Facility, Portsmouth	46,639	5,000	5,000	-41,639	---
20-U-401 On-site Waste Disposal Facility (Cell Line 2&3)	16,500	65,235	65,235	+48,735	---
Subtotal, Portsmouth	430,332	467,546	467,546	+37,214	---
Pension and Community and Regulatory Support	30,967	26,299	31,799	+832	+5,500
Title X Uranium/Thorium Reimbursement Program	5,000	33,500	28,000	+23,000	-5,500
TOTAL, UED&D FUND	841,000	831,340	831,340	-9,660	---
SCIENCE					
Advanced Scientific Computing Research:					
Research	846,055	911,000	896,000	+49,945	-15,000
Construction:					
17-SC-20 Office of Science Exascale Computing Project (SC-ECP)	168,945	129,000	129,000	-39,945	---
Subtotal, Advanced Scientific Computing Research	1,015,000	1,040,000	1,025,000	+10,000	-15,000

DEPARTMENT OF ENERGY
(Amounts in thousands)

	FY 2021 Enacted	FY 2022 Request	Bill	Bill vs. Enacted	Bill vs. Request
Basic Energy Sciences:					
Research	1,856,000	1,995,800	1,988,800	+132,800	-7,000
Construction:					
13-SC-10 LINAC coherent light source II (LCLS-II), SLAC	33,000	28,100	28,100	-4,900	---
18-SC-10 Advanced Photon Source Upgrade (APS-U), ANL	160,000	101,000	101,000	-59,000	---
18-SC-11 Spallation Neutron Source Proton Power Upgrade (PPU), ORNL	52,000	17,000	17,000	-35,000	---
18-SC-12 Advanced Light Source Upgrade (ALS-U), LBNL	62,000	75,100	75,100	+13,100	---
18-SC-13 Linac Coherent Light Source-II-High Energy (LCLS-II-HE), SLAC	52,000	50,000	50,000	-2,000	---
19-SC-14 Second Target Station (STS), ORNL	29,000	32,000	32,000	+3,000	---
21-SC-10 Cryomodule Repair and Maintenance Facility	1,000	1,000	1,000	---	---
Subtotal, Construction	389,000	304,200	304,200	-84,800	---
Subtotal, Basic Energy Sciences	2,245,000	2,300,000	2,293,000	+48,000	-7,000

DEPARTMENT OF ENERGY
(Amounts in thousands)

	FY 2021 Enacted	FY 2022 Request	Bill	Bill vs. Enacted	Bill vs. Request
Biological and Environmental Research	753,000	828,000	805,000	+52,000	-23,000
Fusion Energy Sciences					
Research	415,000	449,000	451,000	+36,000	+2,000
Construction:					
14-SC-60 U.S. Contributions to ITER (U.S. ITER)	242,000	221,000	242,000	---	+21,000
20-SC-61 Matter in Extreme Conditions (MEC) Petawatt Upgrade, SLAC	15,000	5,000	5,000	-10,000	---
Subtotal, Construction	257,000	226,000	247,000	-10,000	+21,000
Subtotal, Fusion Energy Sciences	672,000	675,000	698,000	+26,000	+23,000
High Energy Physics					
Research	777,065	782,000	810,000	+32,935	+28,000
Construction:					
11-SC-40 Long Baseline Neutrino Facility / Deep Underground Neutrino Experiment (LBNF/DUNE), FNAL	171,000	176,000	176,000	+5,000	---
11-SC-41 Muon to electron conversion experiment, FNAL	2,000	13,000	2,000	---	-11,000
18-SC-42 Proton Improvement Plan II (PIP-II), FNAL	79,000	90,000	90,000	+11,000	---
Subtotal, Construction	252,000	279,000	268,000	+16,000	-11,000
Subtotal, High Energy Physics	1,029,065	1,061,000	1,078,000	+48,935	+17,000

DEPARTMENT OF ENERGY
(Amounts in thousands)

	FY 2021 Enacted	FY 2022 Request	Bill	Bill vs. Enacted	Bill vs. Request
Nuclear Physics:					
Research	624,700	700,000	660,000	+35,300	-40,000
Construction:					
14-SC-50 Facility for Rare Isotope Beams, MSU	5,300	---	---	-5,300	---
20-SC-52 Electron Ion Collider, BNL	5,000	20,000	5,000	---	-15,000
Subtotal, Construction	10,300	20,000	5,000	-5,300	-15,000
Subtotal, Nuclear Physics	635,000	720,000	665,000	+30,000	-55,000
Isotope R&D and Production:					
Research:	66,000	78,000	70,000	+4,000	-8,000
Construction:					
20-SC-51 US Stable Isotope Production and Research Center, ORNL	12,000	12,000	12,000	---	---
Subtotal, Construction	12,000	12,000	12,000	---	---
Subtotal, Isotope R&D and Production	78,000	90,000	82,000	+4,000	-8,000
Accelerator R&D and Production	16,935	24,000	18,000	+1,065	-6,000
Workforce Development for Teachers and Scientists	29,000	35,000	35,000	+6,000	---
Science Laboratories Infrastructure:					
Infrastructure Support:					
Payment in Lieu of Taxes	4,650	4,820	4,820	+170	---
Oak Ridge Landlord	5,860	6,430	6,430	+570	---
Facilities and Infrastructure	29,790	17,200	21,350	-8,440	+4,150

DEPARTMENT OF ENERGY
(Amounts in thousands)

	FY 2021 Enacted	FY 2022 Request	Bill	Bill vs. Enacted	Bill vs. Request
Oak Ridge Nuclear Operations	26,000	20,000	26,000	---	+6,000
Subtotal, Infrastructure Support	66,300	48,450	58,600	-7,700	+10,150
Construction:					
17-SC-71 Integrated Engineering Research Center, FNAL	10,250	10,250	10,250	---	---
18-SC-71 Energy Sciences Capability, PNNL	23,000	---	---	-23,000	---
19-SC-71 Science User Support Center, BNL	20,000	38,000	28,000	+8,000	-10,000
19-SC-73 Translational Research Capability, ORNL	22,000	21,500	21,500	-500	---
19-SC-74 BioEPIC, LBNL	20,000	35,000	35,000	+15,000	---
20-SC-71 Critical Utilities Rehabilitation Project, BNL	20,000	26,000	20,000	---	-6,000
20-SC-72 Seismic and Safety Modernization, LBNL	5,000	27,500	5,000	---	-22,500
20-SC-73 CEBAF Renovation and Expansion, TJNAF	2,000	10,000	10,000	+8,000	---
20-SC-74 Craft Resources Support Facility, ORNL	25,000	---	---	-25,000	---
20-SC-75 Large Scale Collaboration Center, SLAC	11,000	12,000	12,000	+1,000	---

DEPARTMENT OF ENERGY
(Amounts in thousands)

	FY 2021 Enacted	FY 2022 Request	Bill	Bill vs. Enacted	Bill vs. Request
20-SC-76 Tritium System Demolition and Disposal, PPPL	13,000	6,400	6,400	-6,600	---
20-SC-77 Argonne Utilities Upgrade, ANL	500	10,000	10,000	+9,500	---
20-SC-78 Linear Assets Modernization Project, LBNL	500	12,850	7,000	+6,500	-5,850
20-SC-79 Critical Utilities Infrastructure Revitalization, SLAC	500	10,000	5,000	+4,500	-5,000
20-SC-80 Utilities Infrastructure Project, FNAL	500	13,300	6,500	+6,000	-6,800
21-SC-71 Princeton Plasma Innovation Center, PPPL	150	7,750	7,750	+7,600	---
21-SC-72 Critical Infrastructure Recovery & Renewal, PPPL	150	2,000	2,000	+1,850	---
21-SC-73 Ames Infrastructure Modernization	150	2,000	2,000	+1,850	---
22-SC-71, Critical Infrastructure Modernization Project (CIMP), ORNL	---	1,000	1,000	+1,000	---
22-SC-72, Thomas Jefferson Infrastructure Improvements (TJII), TJNAF	---	1,000	1,000	+1,000	---
Subtotal, Construction:	173,700	246,550	190,400	+16,700	-56,150
Subtotal, Science Laboratories Infrastructure	240,000	295,000	249,000	+9,000	-46,000
Safeguards and Security	121,000	170,000	170,000	+49,000	---
Program Direction	192,000	202,000	202,000	+10,000	---
TOTAL, SCIENCE	7,026,000	7,440,000	7,320,000	+294,000	-120,000