

estimate of collections in fiscal year 2023 is \$45,770,000.

CALIFORNIA BAY-DELTA RESTORATION
(INCLUDING TRANSFERS OF FUNDS)

The agreement provides \$33,000,000 for the California Bay-Delta Restoration Program.

POLICY AND ADMINISTRATION

The agreement provides \$65,079,000 for Policy and Administration.

ADMINISTRATIVE PROVISION

The agreement includes a provision limiting Reclamation to purchase not more than thirty passenger vehicles for replacement only.

GENERAL PROVISIONS—DEPARTMENT OF THE
INTERIOR

The agreement includes a provision outlining the circumstances under which the Bureau of Reclamation may reprogram funds.

The agreement includes a provision regarding the San Luis Unit and Kesterson Reservoir in California.

The agreement includes a provision regarding section 9504(e) of the Omnibus Public Land Management Act of 2009 (Public Law 111-11).

The agreement includes a provision regarding the Calfed Bay-Delta Authorization Act.

The agreement includes a provision regarding section 9106(g)(2) of the Omnibus Public Land Management Act of 2009.

The agreement includes a provision regarding the Reclamation States Emergency Drought Relief Act of 1991.

The agreement includes a provision regarding WRDA of 2000 (Public Law 106-541).

The agreement includes a provision prohibiting the use of funds in this Act for certain activities.

TITLE III—DEPARTMENT OF ENERGY

The agreement provides \$46,243,359,000 for the Department of Energy to fund programs in its primary mission areas of science, energy, environment, and national security.

REPROGRAMMING REQUIREMENTS

The agreement carries the Department's reprogramming authority in statute to ensure that the Department carries out its programs consistent with congressional direction. The Department shall, when possible, submit consolidated, cumulative notifications to the Committees.

Definition.—A reprogramming includes the reallocation of funds from one program, project, or activity to another within an appropriation. 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.

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. While the Committees appreciate the small progress of including some information in the budget request, the information provided was inadequate because it clearly was not a "meaningful and comprehensive multi-year budget" as required. 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 Office of the Sec-

retary until the Department briefs the Committees on options for ways to provide future-years energy program information.

Commonly Recycled Paper.—The agreement reiterates House direction on this topic.

Congressional Reporting Requirements.—The Department is directed to provide quarterly updates to the Committees on congressional reporting requirements. Further, the Department is directed to provide all congressionally required reports digitally in addition to traditional correspondence.

SBIR and STTR Programs.—The agreement reiterates House direction on this topic.

Mortgaging Future-Year Awards.—The agreement reiterates House direction on this topic.

General Plant Projects.—The agreement reiterates House direction on this topic.

Competitive Procedures.—The agreement reiterates House direction on this topic.

Cost Share Waivers.—The agreement reiterates House direction on this topic.

Notification of Funding Availability.—The agreement includes no direction on this topic.

WORKFORCE DEVELOPMENT AND
DIVERSITY

Workforce Development.—The agreement reiterates House direction on this topic.

The Department is encouraged to prioritize 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 renewable 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 2-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 renewable energy and energy efficiency workforce. The agreement recognizes the Department's collaborations with the Department of Defense to address national security priorities including climate change and electric infrastructure. The agreement 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.

CROSSCUTTING INITIATIVES

Carbon Dioxide Removal.—The agreement provides not less than \$140,000,000 for research, development, and demonstration of carbon dioxide removal technologies, including not less than \$20,000,000 from the Office of Energy Efficiency and Renewable Energy (EERE), not less than \$70,000,000 from Office of Fossil Energy and Carbon Management (FECM), and not less than \$50,000,000 from the Office of Science.

The Department is encouraged to carry out activities under the Carbon Dioxide Removal Research, Development, and Demonstration Program authorized in section 5001 of the Energy Act of 2020. The Department is directed to coordinate these activities among FECM, EERE, the Office of Science, and any other relevant program offices or agencies, including the Environmental Protection Agency and Department of Agriculture.

The agreement reiterates House direction on the development of diverse carbon management technologies and methods.

The agreement reiterates House direction on the development and commercialization of carbon dioxide removal technologies at significant scale.

The agreement reiterates House direction on the carbon removal implementation plan

and the roles and responsibilities of each program participating in the implementation plan.

The Department is directed to establish a competitive purchasing pilot program for the purchase of carbon dioxide removed from the atmosphere or upper hydrosphere, in support of carbon dioxide removal projects authorized in section 969D of the Energy Policy Act of 2005.

Critical Minerals and Materials.—The agreement provides not less than \$248,500,000 for research, development, demonstration, and commercialization activities on the development of alternatives to, recycling of, and efficient production and use of critical minerals and materials, including not less than \$112,000,000 from EERE, not less than \$50,000,000 from FECM, not less than \$25,000,000 from the Office of Science, and not less than \$61,500,000 from the Office of Nuclear Energy (NE).

The agreement reiterates House direction on university initiatives for critical mineral extraction; the Critical Materials Institute and the Critical Materials Consortium; the Critical Materials Supply Chain Research Facility; and workforce needs in critical minerals and materials industries.

The Department is encouraged to carry out these activities pursuant to sections 7001 and 7002 of the Energy Act of 2020.

Energy Storage.—The agreement provides not less than \$540,000,000 for research, development, demonstration, commercialization, and deployment of energy storage, including not less than \$347,000,000 from EERE, not less than \$95,000,000 from the Office of Electricity (OE), not less than \$5,000,000 from FECM, not less than \$10,000,000 from NE, and not less than \$83,000,000 from the Office of Science.

The Department is directed to carry out these activities in accordance with sections 3201 and 3202 of the Energy Act of 2020.

The agreement notes support for the Department's Energy Storage Grand Challenge (ESGC) and Long-Duration Storage Shot Initiatives, which includes cost-shared demonstrations of energy storage technologies.

Energy-Water Nexus.—The agreement reiterates House direction on this topic.

Industrial Decarbonization.—The agreement provides not less than \$685,000,000 for industrial decarbonization activities, including not less than \$420,000,000 from EERE, not less than \$200,000,000 from FECM, and not less than \$65,000,000 from the Office of Science. The Department is directed to establish the Industrial Emissions Reduction Technology Development Program authorized in section 6003 of Public Law 116-206 for clean industrial research, development, and demonstrations that are both sector-specific and technology-inclusive. The program shall coordinate with EERE, FECM, the Office of Science, Office of Clean Energy Demonstrations, and other relevant program offices. Not later than 60 days after enactment of this Act, the Department is directed to detail on how it will improve coordination and align different program offices to implement the recently released Industrial Decarbonization Roadmap strategy, including who within the Department will lead this work. The funds provided are for the development of a suite of technologies to strengthen the competitiveness of America's industrial sector, with an emphasis on heavy industrial sectors, including iron, steel, steel mill products, aluminum, cement, concrete, glass, pulp, paper, industrial ceramics, and chemicals. Within available funds, the agreement provides not less than \$25,000,000 for clean heat alternatives for industrial processes.

Further, the agreement notes a lack of coordination across the Department regarding Industrial Decarbonization activities. Not later than 60 days after enactment of this

Act, the Department is directed to detail on how it will improve coordination and align different program offices to implement the recently released Industrial Decarbonization Roadmap strategy, including who within the Department will lead this work. The Department is encouraged to specify the value-added roles that distinct federal funding streams will play in achieving the emissions reduction goals of the Industrial Decarbonization Roadmap, including across the Department's program offices.

Alternative Modes of Transportation.—The agreement notes the Department's ongoing efforts to develop technologies and low carbon fuels that will reduce emission in shipping, aviation, agricultural, and long-distance transportation.

The agreement provides not less than \$380,000,000 to further the research, development, testing, and demonstration of innovative technologies and solutions for low- or no-emission alternative fuels for ongoing efforts to develop technologies and low carbon fuels that will reduce emission in shipping, aviation, agricultural, and long-distance transportation. This funding level includes not less than \$300,000,000 from EERE, not less than \$35,000,000 from FECM, not less than \$35,000,000 from OE, and not less than \$10,000,000 from the Office of Science.

Further, there are technologies that will reduce emissions in existing locomotive fleets, such as different blends of renewable diesel and biodiesel, as well as to accelerate the commercial viability of innovative technologies and alternatives to traditional diesel fuel, including batteries and hydrogen fuel cells. The agreement notes that hastening the availability of low- and no-carbon alternatives to diesel fuel for locomotives will be essential to addressing climate change while also meeting our nation's projected 50 percent growth in freight transportation demand by 2050. Further, the agreement notes that the decarbonization of the rail industry will be essential to achieving a net-zero emissions economy as rail will continue to play a vital role in such a broad cross-section of industrial economic sectors well into the future. Further, the Department is encouraged to accelerate its work on sustainable aviation fuels, with a focus getting feedstocks and biorefining processes for net-zero emission fuels into demonstration as it works to meet the goals of the Sustainable Aviation Fuel Grand Challenge. The Department is encouraged to develop a clear framework for evaluating the emissions reduction potential of different sustainable aviation fuel pathways and to prioritize research and development of fuels with the greatest potential to reduce GHG emissions while avoiding unintended consequences on forests and food supply chains. The Department is encouraged to work with other federal agencies and the national labs to coordinate efforts to advance sustainable aviation fuels.

DOE and USDA Interagency Working Group.—The agreement reiterates House direction on this topic.

Fluoropolymers.—The agreement reiterates House direction on this topic.

Grid Modernization.—The agreement reiterates House direction on this topic.

The Department is directed 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.

Further, the agreement notes the value of a diverse range of clean distributed energy resources, and the Department is encouraged to evaluate opportunities to deploy multi-resource microgrids that incorporate dispatchable, fuel-flexible, renewable fuel-compatible, distributed generation tech-

nologies, including but not limited to linear generator technology, paired with variable output renewable resources and battery storage technology, in order to simultaneously achieve substantial carbon and criteria emissions reductions, ensure multi-day resilience, and improve energy security and independence.

Harmful Algal Blooms.—The agreement reiterates House direction on this topic.

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

The agreement provides not less than \$316,000,000 for the Hydrogen crosscut, including not less than \$163,000,000 from EERE, not less than \$113,000,000 from FECM, not less than \$23,000,000 from NE, and not less than \$17,000,000 from the Office of Science.

The agreement provides not less than \$15,000,000 for technologies to advance hydrogen use for heavy-duty transportation, industrial, and hard-to-electrify transportation applications including trains, maritime shipping, and aviation.

Integrated Energy Systems.—The agreement reiterates House direction on this topic.

Landfill Emissions.—The agreement reiterates House direction on this topic.

ENERGY PROGRAMS

ENERGY EFFICIENCY AND RENEWABLE ENERGY

The agreement provides \$3,460,000,000 for Energy Efficiency and Renewable Energy.

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

The agreement supports the budget request for the Communities to Clean Energy Program.

Aquatic Decarbonization.—The agreement provides not less than \$40,000,000 for crosscutting efforts that will contribute to multiple areas of ocean- and water-based energy technologies and include support for research, development, and infrastructure that leverages the Department's existing ocean-based assets and infrastructure. The Department is directed to provide to the Committees prior to the obligation of these funds a detailed spending plan highlighting which offices are contributing to this effort and the planned investments in research, development, and deployment, including infrastructure needs.

Database of State Incentives for Renewables and Efficiency.—The Department is directed to support needed security and software upgrades for the Database of State Incentives for Renewables and Efficiency (DSIRE), a program that provides U.S. homeowners, businesses, policymakers, and others with vital information relating to clean energy incentives and policies across the country.

Energy Transitions Initiative.—The agreement provides not less than \$15,000,000 for the Energy Transitions Initiative (ETI), including the Technology-to-Market and Communities subprogram, to support initiatives to address high energy costs, reliability and inadequate infrastructure challenges faced by island and remote communities. The Department is directed to support stakeholder engagement and capacity building and reiterates House direction on community-based initiatives. Additionally, the agreement notes that without a plan to support communities that have or are receiving technical assistance through cohorts 1 and 2, the federal investment risks being stranded. The

Department should provide some level of support and program continuity for these communities from locally relevant technical assistance providers. To facilitate improvement of this initiative, the Department is directed to provide to the Committees not later than 90 days after enactment of this Act a report detailing: 1) current status of projects supported through this program; 2) plans to ensure ETIPP program continuity and follow-up support through regional project partners; 3) offboarding processes for cohorts 1 and 2 as well as how the offboarding processes build a pipeline of projects for other programs in the Department; 4) plans for recruiting and supporting a third cohort of communities; and 5) recommendations on the inclusion of additional geographies supported with additional regional partners.

Workforce Development.—The agreement provides \$5,000,000 to support expanding efforts to include students from underserved institutions in the technology development programs within the Department's portfolio of manufacturing, solar, transportation and grid/energy storage through a university which has existing partnerships with several Historically Black Colleges and Universities and Minority Serving Institutions, and participants in several Departmental applied energy research programs.

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 Department is encouraged to update and publish on its website the list of credentials that are recognized by the Department through its Better Buildings Workforce Guidelines and additional credentials that are relevant to designing, building, and operating building energy systems.

University Research Consortium on Resilience.—In fiscal year 2021 and fiscal year 2022, the agreement directed \$20,000,000 in total for a competitive solicitation which the Department was expected to release in Fall 2022. The Department is directed to release the funding opportunity and award funds expeditiously.

SUSTAINABLE TRANSPORTATION

The agreement provides not less than \$35,000,000 to continue the SuperTruck III vehicle demonstration program and further address the energy efficiency, carbon dioxide emissions reduction potential, and freight efficiency of heavy and medium duty long- and regional-haul vehicles.

Vehicle Technologies.—The Department is encouraged 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.

Within available funds, the agreement supports a solicitation to further develop and demonstrate advanced wireless charging technologies, including charging coils, that reduce cost and improve performance of wireless power transfer and to demonstrate opportunity wireless vehicle charging in northern climates, in areas with high ratio of renewable energy deployment.

The agreement provides up to \$250,000,000 for Battery and Electrification Technologies.

The Vehicle Technologies Office is encouraged to prioritize recycling funding awards for projects that demonstrate recycling of all battery components, including casings and enclosures made from plastics and polymer composites.

The agreement provides \$10,000,000 for research and development of engine architectures that integrate low-carbon fuels like

ethanol and biodiesel, including the performance of these engines on higher blends of renewable fuels.

The agreement provides up to \$25,000,000 to advance energy efficiency and low-emission technologies for off-road application vehicles, including up to \$5,000,000 for fluid power systems. The Department is directed to prioritize applications in ports, warehouses, and railyards. These funds shall be awarded through a competitive solicitation in which university and industry teams are eligible to apply.

The agreement provides not less than \$100,000,000 for Technology Integration and Deployment.

Within available funds for Technology Integration and Deployment, the agreement provides not less than \$10,000,000 be made available to advance the development and demonstration of technologies for electric aircraft for the cargo and logistics industry with the dual purpose of supporting electric delivery trucks.

The Department is directed to continue to support the Clean Cities alternative fuels deployment program focused on vehicles that can deliver lower greenhouse gas emissions and meet customer needs, which can include vehicles powered by biofuels, electricity, hydrogen, natural gas, renewable natural gas, propane, and renewable propane. Within available funds, the agreement provides not less than \$65,000,000 for deployment through the Clean Cities program, including not less than \$20,000,000 in direct cooperative agreements with the Clean Cities Coalitions and not less than \$40,000,000 for competitive grants to support alternative fuel, infrastructure, new mobility, and vehicle deployment activities. When issuing competitive grants in support of these activities, the Department is encouraged to include some awards that range from \$500,000 to \$1,000,000 each and encourage at least one Clean Cities coalition partner. 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 Department is encouraged to prioritize projects that can contribute the greatest reductions in lifecycle greenhouse gases and other harmful air pollutants. The Department is encouraged to work with the Department of Transportation and industry on coordinating efforts to deploy electric vehicle (EV) charging infrastructure. The Department is encouraged to explore ways in which the Clean Cities Program can leverage funding to provide greater support, including through grants, technical assistance, and community engagement, for clean fuels and vehicles in underserved or disadvantaged communities so they can benefit from the emissions reductions and public health benefits delivered by electrification.

The agreement provides not less than \$5,000,000 for electric vehicle workforce development activities. The Department is encouraged to build upon its existing partnerships with the GridEd workforce training program to advance a national electric vehicle workforce. The Department is encouraged to include engagement with the electric industry; auto industry; labor unions; university and community colleges, including Historically Black Colleges and University and other Minority Serving Institutions; and training institutes.

The agreement reiterates House direction on the report directed by the fiscal year 2022 Act on challenges in cost-effective and safe operation of vehicles. The Department is directed to coordinate with the Department of Transportation and the Joint Office of Energy and Transportation to develop a roadmap for electric vehicle transition and work-

force training. The Department is also directed to coordinate with the Clean Cities Program, the Department of Transportation, and the Joint Office of Energy and Transportation to ensure all activities are aligned to meet the goals of widespread adoption of electric vehicles.

The agreement provides not less than \$54,000,000 for Energy Efficient Mobility Systems, including not less than \$34,000,000 to conduct early-stage research and development at the vehicle, traveler, and system levels and not less than \$20,000,000 for pilot and demonstration projects pairing self-driving technology with zero-emission vehicles to help ensure mobility does not come at the cost of increased tailpipe pollution.

The agreement provides up to \$10,000,000 to improve 12-volt lead batteries for safety-critical electric vehicle applications.

The agreement provides \$10,000,000 for novel engine designs that can achieve significant efficiency improvements in hydrogen combustion. The Department is encouraged to support research and development for hydrogen combustion by two-stroke opposed piston engines.

The Department is encouraged to work with the Department of Transportation and industry on coordinating efforts to deploy hydrogen fueling infrastructure.

The Department, in coordination with the Joint Office of Energy and Transportation, is encouraged to assess if the capacity of electricity distribution can meet anticipated electricity demand at proposed charging locations. The Department is encouraged to consult with stakeholders and entities tasked with overseeing the U.S. electric grid in this assessment.

The Department, in coordination with the Environmental Protection Agency, is encouraged to consider the benefits of a competitive voucher program to continue improving the energy efficiency of commercial long-haul vehicles with active emission-reducing technology.

The agreement provides up to \$5,000,000 for research on direct injection, engine technology, and the use of dimethyl ether as fuel.

The agreement provides up to \$10,000,000 to address technical barriers to the increased use of natural gas vehicles, with a focus on those utilizing non-fossil based, renewable natural gas. Technical barriers include demonstrations of advanced natural gas vehicles and fueling infrastructure, medium and heavy duty on-road natural gas engine research and development, energy efficiency improvements, emission reduction technologies, fueling infrastructure optimization, and renewable gas production research and development.

The Department is directed to prioritize recycling funding awards for projects that demonstrate recycling of all battery components, including casings and enclosures made from plastics and polymer composites.

The Department is directed to prioritize funding and technical assistance through its grant programs for electric vehicle car share programs at public housing facilities.

The Department is directed, in coordination with the Department of Transportation and the Joint Office of Energy and Transportation, to focus on increasing availability of and access to publicly accessible charging infrastructure that can support both personal vehicle uses and ride-share services, particularly in underserved or disadvantaged communities that lack convenient access to such infrastructure.

The Department is encouraged in its position in the Joint Office of Energy and Transportation to increase deployment and accessibility of electric vehicle charging infrastructure in underserved or disadvantaged communities through grants, technical as-

sistance, and community engagement and to address “soft costs” of installing EV charging infrastructure, such as permitting and interconnection challenges, to accelerate deployment. The Department is encouraged to develop and submit a roadmap to the Committees to provide voluntary technical assistance to municipalities aimed at reducing the time and costs for permitting, inspecting, and interconnecting publicly available EV supply equipment through standardized requirements, online application systems, recognition programs, and technical assistance.

Bioenergy Technologies.—The agreement supports research to develop the foundation for scalable techniques to use carbon dioxide produced in various plants, such as in biorefineries, to produce higher value fuels, chemicals, or materials.

The agreement provides up to \$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.

The agreement provides not less than \$44,000,000 for feedstock technologies research and the Biomass Feedstock National User Facility and \$40,000,000 for algae-related activities.

The agreement provides not less than \$23,000,000 for the Agile BioFoundry to accelerate the Design-Build-Test-Learn cycle for biofuels and bioproducts with a focus on sustainable aviation fuels.

The agreement provides not less than \$100,000,000 for Conversion Technologies. Within available funds for Conversion Technologies, the agreement provides \$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.

The agreement provides up to \$6,000,000 to support research, at commercially relevant processing scales, into affordable preprocessing of forest residue technologies, forest residue fractionation technologies, and other processing improvements relevant to thermal deoxygenation biorefineries in order to enable economic production of sustainable aviation fuels and economic upgrading of hemicelluloses and lignin.

The agreement provides not less than \$70,000,000 for System Development and Integration, including for demonstration activities. The agreement reiterates House direction on feedstocks and biorefining processes for sustainable aviation fuels.

The Department is directed to address research challenges to maximize use of atmospheric carbon dioxide, including in highly alkaline conditions to maximize carbon capture. This research shall aim to eliminate the requirement for co-location of algal production facilities with power plants or costly, low-volume pipelines; increase algal productivity levels; and lower the cost of biofuel production.

Hydrogen and Fuel Cell Technologies.—The Department is directed to maintain a diverse program that focuses on early-, mid-, and late-stage research and development and technology acceleration, including market transformation.

The agreement provides not less than \$100,000,000 for H2@Scale.

The agreement provides not less than \$60,000,000 for technologies to advance hydrogen use for hard-to-electrify transportation applications, including trains, maritime shipping, and aviation.

The agreement provides up to \$30,000,000 for Fuel Cell Technologies.

The agreement provides \$10,000,000 for perovskites and other catalysts and catalyst supports for hydrogen carriers. The Department should prioritize efforts that couple computational modeling, experimental characterization, and controlled synthesis, along with durability and degradation science. The Department is encouraged to prioritize efforts that include partnerships between at least one academic partner and one national laboratory.

The agreement provides not less than \$10,000,000 for solar fuels research and development for hydrogen generation. The Department is encouraged to leverage research and technology advances from the Fuels from Sunlight Hub.

The agreement supports the Department's continued activities for high temperature electrolyzer development and integrated pilot level technology testing and validation, including at national laboratories.

The agreement reiterates House direction on alkaline and proton exchange membrane (PEM) electrolyzers.

The Department is directed to continue to consider the economic and environmental impacts of various modes used to transport hydrogen in its decision-making process.

The Department is directed to prioritize opportunities to advance a network of pipelines to reliably deliver adequate supplies of hydrogen for end users.

The Department is directed to continue efforts aimed at reducing the cost of hydrogen production, storage, and distribution including novel onboard hydrogen tank systems, trailer delivery systems, and development of systems and equipment for hydrogen pipelines.

The agreement provides not less than \$15,000,000 for Safety, Codes, and Standards to maintain a robust program and engage with state and local agencies to support their technical needs relative to hydrogen infrastructure and safety.

RENEWABLE ENERGY

The agreement provides up to \$5,000,000 for the Wind Energy Technologies Office and the Water Power Technologies Office to support university-led research projects related to resource characterization, site planning, aquaculture assessments, community outreach, and planning for long term environmental monitoring for applications of marine energy and floating offshore wind technologies to support sustainable, scalable aquaculture production.

Solar Energy Technologies.—The agreement provides not less than \$60,000,000 for Concentrating Solar Power Technologies and not less than \$77,000,000 for Photovoltaic Technologies.

The agreement provides not less than \$45,000,000 for Balance of System Soft Costs efforts focused on reducing the time and costs for permitting, inspecting, and interconnecting distributed solar and storage projects installed behind the customer's meter through standardized requirements, online application systems, and grant awards to localities which voluntarily adopt the Solar Automated Permit Processing platform.

The agreement provides up to \$40,000,000 to continue and expand work to lower barriers to solar adoption for low-income households, renters, multifamily homes, and minority communities. The Department is encouraged to explore and provide resources on financing and business models that are well-suited to these households and communities.

The agreement provides not less than \$5,000,000 for the National Community Solar Partnership program.

The agreement provides up to \$10,000,000 for technology development, testing and verification of technologies that help solar energy projects avoid, minimize, and mitigate impacts on wildlife and ecosystems, including through improved scientific research into avian-solar interactions.

The agreement provides not less than \$55,000,000 for Systems Integration and not less than \$70,000,000 for Manufacturing and Competitiveness.

The agreement provides not less than \$25,000,000 for research, development, demonstration, and commercial activities related to cadmium telluride (CdTe). This work shall align with the goals of the technology roadmap for research: reducing CdTe module manufacturing costs, addressing supply chain challenges, achieving greater cell and module efficiency, cutting CdTe solar costs while extending solar panel life, and increasing the global market share of domestically produced photovoltaics.

The agreement provides not less than \$25,000,000 for perovskites.

The Department is directed to support the development of small-scale pilot manufacturing plants for perovskite photovoltaics. The Department is encouraged to issue awards to commercial-ready solar perovskite entities that are prepared to scale up solar technologies.

The agreement notes support for the recently established Perovskite Accelerator for Commercializing Technologies (PACT) Center, which has been established for testing the durability of perovskite photovoltaics. The Department is encouraged to consider establishment of a companion research accelerator to advance the underpinnings of the technology, following the model established for the CdTe Consortium that was announced by the Department in 2020. A perovskite R&D accelerator could be focused on nucleation and degradation, the science of inherent material stability, new substrates, energy loss mechanisms, ultra-high efficiency bifacial and tandem devices, and inherently scalable production methods such as solution processing and roll-to-roll manufacturing.

The Department is directed to continue supporting the regional demonstration sites under the Solar Energy Technologies Office.

Wind Energy Technologies.—The agreement provides not less than \$13,000,000 for distributed wind technologies.

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. The Department should continue to prioritize mission readiness and optimization of the operations of the National Wind Technology Center. The agreement provides not less than \$5,000,000 for research and operations of the Integrated Energy System at Scale, a large-scale research platform using high-performance computing, modeling and simulation, including improved models that can be used to understand atmospheric and wind power plant flow physics, and reliability and grid integration efforts.

The agreement provides up to \$30,000,000 to initiate the establishment of a university-based development and testing facility capable of supporting industrial prototyping and manufacturing of turbine systems capable of producing upwards of 30 megawatts of power per unit. The Department is further directed to support the accompanying electric grid integration of these offshore wind turbine capabilities.

The agreement provides not less than \$65,000,000 for offshore wind. The Department is directed to support innovative offshore wind demonstration projects to optimize

their development, design, construction methods, testing plans, and economic value proposition. Within available funds for offshore wind, the agreement provides not less than \$6,000,000 for advanced technology demonstration of floating offshore wind projects.

Within available funds for offshore wind, the agreement provides up to \$6,000,000 for Centers of Excellence focused on the offshore wind energy engineering, infrastructure, supply chain, transmission, and other pertinent issues required to support offshore wind in the United States.

Within available funds for offshore wind, the agreement provides not less than \$30,000,000 for floating offshore research, development, and demonstration, including activities to facilitate interconnection between offshore generation facilities and the grid.

The Department is encouraged to continue to support research and development related to siting and environmental permitting issues, which if not properly addressed may lead to unnecessary delays in achieving the national goal to deploy 30 gigawatts of offshore wind generation by 2030. In considering research and development funding related to siting and environmental permitting issues, the Department shall prioritize the development of technologies and capabilities related to minimizing impacts to coastal communities, federal radar missions, and living marine resources.

The Department is encouraged to continue focusing efforts with non-profit and academic partners to conduct coastal atmospheric boundary layer characterization that will help optimize and inform efforts of the Department of Interior's Bureau of Ocean Energy Management and assist the growing domestic coast wind energy industry.

Water Power Technologies.—The agreement provides not less than \$59,000,000 for Hydro-power Technologies and not less than \$120,000,000 for Marine Energy. The Department is encouraged to utilize existing authorities to waive cost share for water power technologies research, development, demonstration, and deployment activities.

The agreement provides up to \$10,000,000 for demonstration of a modular pumped storage project. The agreement provides up to \$35,000,000 to expand the HydroWIREs program to enhance the flexibility of America's hydropower and pumped storage hydropower resources, including support for research, development, and demonstration to advance pumped storage hydropower projects. The Department is encouraged to continue efforts that support and demonstrate increased grid reliability and integration of other renewable energy resources, including applications to optimally integrate small hydropower with advancements in battery storage and other grid services.

The agreement provides up to \$10,000,000 to continue industry-led research, development, demonstration, and deployment efforts of innovative technologies for fish passage and invasive fish species removal at hydropower facilities, as well as analysis of hydrologic climate science and water basin data to understand the impact of climate change on hydropower. The agreement provides up to \$5,000,000 for innovative analytics to optimize hydropower applications such as machine learning-based hydrologic forecasts and operations optimization technology advancement.

The agreement provides up to \$15,000,000 for small hydropower innovation, testing, and initiatives, including industry-led competitive solicitations for advanced turbine demonstrations; improved environmental performance; standardized or modular project deployment applications; and advanced manufacturing and supply chain innovations. The Department is encouraged to

support innovative analytics to optimize hydropower applications such as machine learning-based hydrologic forecasts and operations optimization technology advancement.

The agreement provides up to \$10,000,000 for design and engineering based on the outcome of the Department's ongoing scoping activities toward a network of hydropower testing facilities. The fiscal year 2022 Act directed the Department to provide a briefing on its strategy for establishing these facilities. The Department is directed to provide it not later than 30 days after enactment of this Act.

The agreement provides up to \$5,000,000 for irrigation modernization demonstration and deployment activities including physical sites and digital tools that advance energy, water, environmental, community, and agricultural benefits.

The agreement provides up to \$10,000,000 for the purposes of sections 242 and 243 of the Energy Policy Act of 2005 as being carried out by the Grid Deployment Office.

Within available funds for Marine Energy, the agreement provides not less than \$50,000,000 for industry-led competitive solicitations to increase energy capture, improve reliability, and to assess and monitor environmental effects of marine energy systems and components at a variety of scales, including full-scale prototypes. Within available funds for Marine Energy, the agreement provides up to \$20,000,000 for continuation of foundational research activities led by universities and research institutions affiliated with the National Marine Energy Centers. Within available funds for Marine Energy, the agreement provides up to \$10,000,000 for operations at the National Marine Energy Centers in order to accelerate the transition of marine energy technologies to market.

Within available funds for Marine Energy, the agreement provides not less than \$27,000,000 address infrastructure needs at marine energy technology testing sites, including general plant projects and planning activities for the staged development of an ocean current test facility and upgrades to facilities that provide cost effective open water access for prototype testing. Within available funds for infrastructure needs at marine energy technology testing sites, the agreement provides up to \$5,000,000 for the development and construction of an open water, fully energetic, grid connected ocean current energy test facility, not less than \$5,000,000 for general purpose plant projects, and not less \$22,000,000 to complete construction of the grid connected wave energy test facility.

The agreement provides not less than \$5,000,000 for the Department's Marine and Coastal Research Laboratory. The agreement provides up to \$8,000,000 for continuation of the Testing Expertise and Access for Marine Energy Research initiative. The agreement supports the Atlantic Marine Energy Center. The Department is directed to continue to coordinate with the U.S. Navy and other federal agencies on marine energy technology development for national security and other applications.

The agreement provides \$24,000,000 for the Powering the Blue Economy initiative. The Department is directed to continue leveraging existing core capabilities at national laboratories to execute this work, in partnership with universities and industry.

The Department is encouraged to use its cost share waiver authority under section 988 of the Energy Policy Act of 2005, when applicable and as appropriate, for water power technology research, development, demonstration, and deployment activities.

The agreement recognizes the challenges of decarbonizing remote communities and

the maritime sector. The Department is encouraged to continue to focus on activities addressing 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 agreement supports research, development, and demonstration, including implementation of the recommendations outlined in the GeoVision study and authorized in the Energy Act of 2020.

The agreement provides up to \$100,000,000 for enhanced geothermal system demonstrations (EGS) and next-generation geothermal demonstration projects in diverse geographic areas. The Department is directed to include demonstration projects in an area with no obvious surface expression or to develop deep, direct use geothermal technologies to distribute geothermal heat through an integrated energy system or district heating system. The Department is directed to consider Superhot Rock geothermal demonstrations in which water, at that depth, would reach supercritical conditions and demonstrate incremental improvements toward producing supercritical water at the surface.

Renewable Energy Grid Integration.—The agreement provides \$45,000,000 for activities to facilitate the integration of grid activities among renewable energy technologies and to include integrated system analysis, technical assistance, and innovative municipal or community-driven initiatives to increase the use and integration of renewable energy in the United States. Within available funds, the agreement provides \$10,000,000 for development and demonstration of an “energyshed” management system that addresses a discrete geographic area in which renewable sources currently provide a large portion of electric energy needs, where grid capacity constraints result in curtailment of renewable generation, and with 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.

ENERGY EFFICIENCY

Advanced Manufacturing.—The agreement provides not less than \$185,000,000 for Industrial Efficiency and Decarbonization.

The agreement reiterates House direction related to the conversion and retooling of industrial facilities.

Within available funds for Industrial Efficiency and Decarbonization, the agreement provides \$20,000,000 for continued research for energy efficiency improvement and emissions reduction in the chemical industry including dynamic catalyst science coupled with data analytics.

Within available funds for Industrial Efficiency and Decarbonization, the agreement provides up to \$10,000,000 for the issuance of a competitive solicitation for university and industry-led teams to improve the efficiency of industrial drying processes.

The agreement provides not less than \$105,000,000 for Clean Energy Manufacturing.

Within available funds for Clean Energy Manufacturing, the agreement provides \$25,000,000 for the Manufacturing Demonstration Facility (MDF) and the Carbon Fiber Technology Facility. Within available funds for the MDF, the agreement includes \$5,000,000 for the development of processes for materials solutions.

Within available funds for Clean Energy Manufacturing, the agreement provides \$10,000,000 for the development of advanced tooling for lightweight automotive compo-

nents to lead the transition to electric vehicle and mobility solutions to meet the national urgency for market adoption. The Department is directed to further foster the partnership between the MDF, universities, and industry in the Great Lakes region for economic growth and technology innovation and manufacturing scale up related to mobility and advanced electric vehicles, thereby accelerating technology deployment and increasing the competitiveness of U.S. manufacturing industries.

Within available funds for Clean Energy Manufacturing, the agreement provides up to \$15,000,000 to provide ongoing support for the Combined Heat and Power (CHP) Technical Assistance Partnerships and related CHP activities. The Department is directed to collaborate with industry on the potential energy efficiency and energy security gains to be realized with district energy systems.

Within available funds for Clean Energy Manufacturing, the agreement provides \$5,000,000 for advanced manufacturing of large wind blades.

Within available funds for Clean Energy Manufacturing, the agreement provides \$3,000,000 for advanced manufacturing of large iron and steel castings and forgings for offshore wind turbines.

The agreement supports additive manufacturing technologies for wind energy applications.

The agreement notes the important role large-area additive manufacturing can play in helping to advance the deployment of building, transportation, and clean energy technologies. The Department is directed 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.

Within available funds for Clean Energy Manufacturing, the agreement provides up to \$5,000,000 for university-led research and development of catalytic processes to transform low value feedstocks into carbon-neutral liquid fuels and chemical products.

Within available funds for Clean Energy Manufacturing, the agreement provides \$10,000,000 to support sustainable chemistry research and development. The fiscal year 2021 Act directed the Department to provide a report exploring how incorporating sustainable chemistry in consumer and commercial manufacturing processes fits within its research and development portfolio and can benefit these processes. The Department is directed to provide the report immediately.

Within available funds for Clean Energy Manufacturing, the agreement provides up to \$5,000,000 for university-led research in order to increase recycling rates for polyethylene plastics and develop conversion of waste polyethylene to more recyclable and biodegradable plastics.

Within available funds for Clean Energy Manufacturing, the agreement provides up to \$20,000,000 to continue development of additive manufacturing involving nanocellulose feedstock materials made from forest products. This work shall be conducted in partnership with the MDF to leverage expertise and capabilities for large scale additive manufacturing.

Within available funds for Clean Energy Manufacturing, the agreement provides \$2,000,000 to fund lithium-ion battery rejuvenation, recycling, and reuse programs that will focus on research, education, and workforce development to help the economy and national energy security. The agreement reiterates House direction on these efforts.

Within available funds for Clean Energy Manufacturing, the agreement provides up to \$12,000,000 for research in silicon carbide and gallium nitride power electronics.

Within available funds for Clean Energy Manufacturing, the agreement provides up to \$5,000,000 to continue development of low-cost polymer infiltration processes for the fabrication of ceramic matrix composites and other advanced material processes for high-temperature components, including silicon carbide components.

The Department is directed to support the expeditious development and production of lithium battery technology to scale up the domestic battery supply chain. Within available funds for Clean Energy Manufacturing, the agreement provides up to \$10,000,000 for solid state lithium metal battery storage demonstration projects that are U.S.-controlled, U.S.-made, and North American sourced and supplied. The Department is directed to prioritize battery technology that is compatible with existing and next generation cathodes, including nickel and cobalt free cathodes, will further enhance energy density, and is intrinsically nonflammable.

The agreement notes the Department's efforts to expand the capabilities of the United States in advanced battery manufacturing for long-duration grid-scale energy storage. As the Department continues its efforts to scale up a domestic advanced battery supply chain, including battery manufacturing demonstration projects, the Department is encouraged to seek a broad spectrum of battery chemistries not wholly exclusive to lithium-ion based battery technology and encourages the Department to craft-grant solicitations widely enough to include all compelling emerging technologies such as multi-day storage (MDS) chemistries such as iron-air batteries or other new configurations.

The agreement provides not less than \$80,000,000 for Material Supply Chains.

Within available funds for Material Supply Chains, the agreement provides up to \$5,000,000 to increase participation in databases used in generating environmental product declarations (EPDs), the disclosure tool measuring the embodied carbon of a product or service, in coordination with the Environmental Protection Agency.

Within available funds for Material Supply Chains, the agreement provides up to \$15,000,000 for a competitive grant program to improve the sustainability and competitiveness of U.S. mining operations, including the beneficial use of byproducts such as capturing excess nitrogen oxide and utilizing it to produce ammonium sulfate fertilizer suitable for agricultural use.

Within available funds for Material Supply Chains, the agreement provides 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 manufacturing processes for aerostructures and other large composite structures.

The agreement provides not less than \$45,000,000 for Technical Assistance and Workforce Development.

Within available funds for Technical Assistance and Workforce Development, the agreement provides \$5,000,000 to expand the technical assistance provided for water and wastewater treatment. Within available funds for Technical Assistance and Workforce Development, the agreement provides \$20,000,000 for research and development on technologies to achieve energy efficiency of water and wastewater treatment plants, including the deployment of advanced technology, as appropriate.

The Department is encouraged to support innovation in water technologies that will incentivize technology developments for the

blue economy, including consideration of establishing a Center of Excellence, with a focus on the Great Lakes region.

Within available funds for Technical Assistance and Workforce Development, the agreement provides not less than \$10,000,000 for the Lab-Embedded Entrepreneurship Program (LEEP) and reiterates House direction on this topic.

Building Technologies.—Within available funds for Emerging Technologies, the Department is encouraged to make funding available for heating, ventilation, and air conditioning (HVAC) and refrigeration research, development and deployment, including heat pumps, heat pump water heaters and boilers. The Department shall focus its efforts to address whole building energy performance and cost issues to inform efforts to advance beneficial electrification and greenhouse gas mitigation without compromising building energy performance.

The agreement provides not less than \$70,000,000 for Commercial Building Integration for core research and development of more cost-effective integration techniques and technologies that could help the transition toward deep retrofits, not less than \$60,000,000 for Residential Buildings Integration, and not less than \$75,000,000 for Equipment and Building Standards.

The Department is directed to advance building upgrades and weatherization of homes, as well as to advance work in grid-integrated efficient buildings and inclusion of smart grid systems, demand flexibility and new initiatives in workforce training to ensure the technology and research findings reach practitioners. The Department is encouraged to concentrate funding 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 and other market transformation activities.

The agreement provides up to \$30,000,000 for the Building Energy Codes Program to increase training, including certifications, and provide technical assistance to states, local governments, regional collaboratives, workforce development providers, home-builders, office builders, architects and engineers, and other organizations that develop, adopt, or assist with the adoption or compliance with model building energy codes and standards to improve energy efficiency and resilience.

The agreement provides not less than \$30,000,000 to continue to invest in transactive energy and control research and development efforts to support demonstrations in which renewable energy and energy efficiency elements connected to the electric grid, such as buildings; wind and solar; energy storage; including batteries; hydrogen technologies; and electric vehicle charging stations, work together seamlessly to enhance reliability, security, and efficiency of the nation's electric grid. The Department is directed to prioritize market-based transactive energy principles, from the individual energy generation/consumption nodes to the wholesale and energy distribution markets. The Department is directed to establish efforts in various parts of the country where prevailing weather and market constructions differ. The Department is further directed to prioritize projects that connect multiple physically separated sites with multiple topologies.

The Department is directed to carry out the Grid-Interactive Efficient Buildings (GEB) program to ensure that a high level of energy efficiency is a core element of the

program and a baseline characteristic for GEBs, which are also connected, smart, and flexible. EERE shall engage with the public and private sectors, including the building and manufacturing industries and state and local governments, to share information on GEB technologies, costs, and benefits, and to provide information to position American companies to lead in this area.

The agreement provides up to \$50,000,000 for solid-state lighting.

The agreement provides up to \$40,000,000 to facilitate deep whole-house energy efficiency retrofits, particularly those using innovations from the Advanced Building Construction Initiative, such as demonstrations, outreach, engagement, and training to private sector contractors, including continuing efforts to advance smart home technology.

The Department is directed to develop programs to support a skilled, robust, diverse, and nationally representative building energy efficiency and building energy retrofit workforce. The agreement provides up to \$40,000,000 for these activities.

The agreement provides up to \$30,000,000 for energy-related research and development in buildings.

The Department is encouraged to expand efforts within the Advanced Building Construction initiative to scale development and adoption of innovative technologies to produce affordable, energy efficient buildings and retrofits with low lifecycle carbon impacts. The Department is directed to support technical assistance to state, local, and tribal governments to reduce emissions from buildings through efficient electrification strategies.

The Department is encouraged to concentrate funding 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 and other market transformation activities. Further, the Department is encouraged to support deep whole-house energy efficiency retrofits, particularly those using innovations from the Advanced Building Construction Initiative, such as demonstrations, outreach, engagement, and training to private sector contractors, including continuing efforts to advance smart home technology. The agreement notes support for continued efforts to address property rating and valuation in commercial and residential buildings as a way to improve transparency of energy utilization in buildings for persons and companies buying or leasing property.

The Department is encouraged to support university research, in partnership with national labs, for developing, building, and evaluating cross-laminated timber wall systems for embodied energy content, operating energy efficiency, wall moisture profiles, structural connector durability, and health monitoring sensors.

The agreement notes support for continued research to quantify the resilience impacts of energy codes for buildings, occupants, and communities. Recognizing that the pandemic has presented challenges to permit processing for building departments reliant on paper-based systems, the Department is encouraged to develop cloud-based software that can facilitate permit processing for projects that conserve energy or promote resilience as well as efforts to help departments modernize systems.

The Department is directed to prioritize energy efficiency measures that reduce energy consumption, especially among high energy-burden households within communities

of color. The Department is directed further to focus on increasing availability of and access to publicly, individually, and community-owned heat pumps.

The Department is directed to support collaborative projects with the Department of Agriculture's Agricultural Research Service to improve the energy efficiency in controlled environmental agriculture (CEA).

The Department is encouraged to work with two-year community and technical colleges, labor, and nongovernmental and industry consortia to advance job training programs and to collaborate with the Department of Education, the Department of Labor, and the residential and commercial efficiency building industry to ensure support is reaching small energy efficiency businesses that have had difficulty accessing federal workforce support.

The agreement provides up to \$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.

STATE AND COMMUNITY ENERGY PROGRAMS

The Department is directed to coordinate and expand activities to convene municipal governments, provide robust and tailored technical assistance to municipal governments, and provide funding and support to municipal governments or national and local partner organizations to implement best practices to advance energy efficiency adoption, building and vehicle electrification, grid modernization, distributed electricity generation, and workforce development at the local level. The Department is directed to include work with organizations that convene and support municipal governments.

The Department is directed to obligate funds for State and Community Energy Programs expeditiously to grantees.

The Department is directed to achieve staffing levels that will allow it to provide robust training, technical assistance, and oversight for the Weatherization Assistance Program (WAP) and the State Energy Program (SEP).

Weatherization.—The Department is directed to provide to the Committees not later than 30 days after enactment of this Act a briefing regarding ongoing efforts at the Department to collaborate with the Department of Health and Human Services' Low Income Home Energy Assistance Program (LIHEAP) program and the Department of Housing and Urban Development's HOME Investment Partnerships Program (HOME). The Department is encouraged to work collaboratively with other federal agencies and to outline ways the various weatherization and home assistance programs can better integrate assistance for structurally deficient but weatherable residences.

Within available funds, the agreement provides \$1,000,000 for WAP grant recipients that have previously worked with the Department via the Weatherization Innovation Pilot Program, for the purpose of developing and implementing state and regional programs to treat harmful substances, including vermiculite.

The agreement 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 occurrence of window replacements, which supports the reduction of lead-based paint hazards in homes.

The agreement notes that the Department is working to update the Weatherization As-

sistance Program and encourages the Department to update the calculation of the Savings-to-Investment Ratio (SIR) to reflect total whole home savings and to account for the total value measures that keep homes prepared for future climate conditions. The Department is encouraged to continue its work enabling states to create priority lists of measures to reduce energy audit time and increase the rate of production.

The Department is encouraged 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. The Department is encouraged to prioritize initiatives that promote green, healthy, and climate resilient schools, libraries, and other public buildings.

State Energy Program.—The Department is directed to support technical assistance on energy and related air quality in schools.

The Department is encouraged to prioritize initiatives that promote green, healthy, and climate resilient schools, libraries, and other public buildings.

MANUFACTURING AND ENERGY SUPPLY CHAINS

The agreement provides up to \$15,000,000 to support the Industrial Assessment Center (IAC) program. The Department is directed to apply the additional funding to support regions that are currently designated as underserved through the IAC program.

FEDERAL ENERGY MANAGEMENT PROGRAM

The agreement provides up to \$2,000,000 for workforce development and the Performance Based Contract National Resource Initiative.

The Department is directed to continue the consideration of all AFFECT grant funding to be leveraged through private sector investment in federal infrastructure to ensure maximum overall investment in resiliency, efficiency, emissions reductions, and security. The Department is encouraged to prioritize funding to projects that attract at least ten dollars for each federal dollar invested and that utilize public-private partnerships like energy savings performance contracts (ESPCs) and utility energy service contracts (UESCs).

The agreement supports the Net-Zero Laboratory Initiative to achieve ambitious, real-world pathways to net-zero emissions with enhanced resilience. The Department is directed to continue this effort. The Department is encouraged to prioritize funding projects from the national laboratory pilot's established roadmaps to catalyze adoption not only for other national laboratories but also to the entire federal agencies' operational footprints.

CORPORATE SUPPORT

Program Direction.—The agreement provides not less than \$22,000,000 for the Office of State and Community Energy Programs, not less than \$1,000,000 for the Office of Manufacturing and Energy Supply Chains, not less than \$14,000,000 for the Federal Energy Management Program, and not less than \$180,000,000 for the Office of Energy Efficiency and Renewable Energy.

CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE

The agreement provides \$200,000,000 for Cybersecurity, Energy Security, and Emergency Response (CESER).

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

The Department is directed to include an itemization of funding levels below the control point in future budget submissions.

Given concerns about the longstanding lack of clarity on the Department's cyber research and development responsibilities, CESER is directed to coordinate with the Office of Electricity and relevant applied energy offices in clearly defining these program activities. The Department is directed to provide the Committees quarterly updates on these topics.

In light of documented cyber targeting of utilities, including by state actors, the agreement encourages the Department to incorporate pilot programs with private sector participants to demonstrate active defense cybersecurity protection.

The Department is encouraged to develop cybersecurity consortiums of public-private partnerships between public universities, local and state government, and private industry to develop a community of relevance in cybersecurity workforce development for the energy sector.

The Department is encouraged to expand student research participant opportunities within its cyber workforce development programs and projects by expanding its utilization of the DOE Scholars Program.

Risk Management Technology and Tools.—The agreement provides \$20,000,000 for the Cyber Testing for Resilient Industrial Control System (CyTRICS) program.

The agreement provides \$5,000,000 for consequence-driven cyber-informed engineering, and \$5,000,000 to support efforts to enable security by design through execution of the national cyber-informed engineering strategy.

The agreement provides not less than \$6,800,000 to expedite development and testing of secure inputs, processing, and outputs of systems utilizing novel cybersecurity technology.

The agreement provides up to \$5,000,000 for university-based research and development of scalable cyber-physical platforms for resilient and secure electric power systems that are flexible, modular, self-healing, and autonomous. This activity should be conducted in coordination with the Office of Electricity.

The agreement provides not less than \$5,000,000 to conduct a demonstration program of innovative technologies, such as technologies for monitoring vegetation management, to improve grid resiliency from wildfires.

The Department is encouraged to establish partnerships among universities and national laboratories to advance research on cyber-immune critical infrastructure.

The agreement provides up to \$2,500,000 for regional-scale high-performance computer simulations of earthquake analysis of the energy system.

Preparedness, Policy, and Risk Analysis.—The Department is encouraged to continue trusted partnerships with information sharing platform providers which reduce security risks by not collecting and centralizing sensitive data such as IP addresses, logs, packet captures and file names and keep participants' data on premises. The recommendation provides up to \$10,000,000 to expand collective defense and community-wide visibility programs designed for operational technology and industrial control system networks.

The agreement supports 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.

ELECTRICITY

The agreement provides \$350,000,000 for Electricity. Given concerns about the long-standing lack of clarity on the Department's cyber research and development responsibilities, the Office of Electricity (OE) is directed to coordinate with the Office of Cybersecurity, Energy Security, and Emergency Response (CESER) and other relevant offices in clearly defining these program activities. The Department is expected to integrate cybersecurity, where relevant, throughout all of OE's research, development, demonstration, and deployment activities. The Department is directed to provide the Committees quarterly updates on these topics.

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

The Department is directed to include an itemization of funding levels below the control point in future budget submissions.

The agreement provides up to \$15,000,000 for energy storage technology and microgrid assistance to assist electric cooperatives and municipal power utilities in deploying energy storage and microgrid technologies.

The Department is directed to provide to the Committees not later than 180 days after enactment of this Act a report related to the ability of the electric system to meet the demand of new electric vehicle charging infrastructure. The report should anticipate the growth in the use of light duty, medium duty, and heavy duty electric vehicles and assess how much additional electric generation, transmission, and distribution capacity will need to be added to the electric system to meet demand. Further, the Department is encouraged to develop a plan on how the Department can assist the electric system in meeting the anticipated increase in demand, and then provide Congress with recommendations on how the study can be supported legislatively. The Department is directed to provide to the Committees not later than 90 days after submission of the report a plan, including recommendations, on how the Department can assist the electric system in meeting the anticipated increase in demand. For the report and plan, OE is directed to coordinate with the Grid Deployment Office, the Vehicle Technologies Office, and the Joint Office of Energy and Transportation.

GRID CONTROLS AND COMMUNICATIONS

Resilient Distribution Systems.—The Department is directed 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 agreement places a high priority on addressing the challenges facing the electric power grid by advancing the deployment of innovative technologies, tools, and techniques to modernize and increase the resiliency of the distribution portion of the electricity delivery system. The Department is encouraged to work with national laboratories and industry to advance best practices to technology deployment and adoption across the country.

The Department is encouraged to pursue 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 Department is directed to evaluate currently available distributed fuels, such as propane-fueled

microgrids and their ability to be paired with renewable technology.

The Department is directed 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 and funds provided for the Advanced Grid Research and Development Division for these activities. The agreement supports advanced control concepts and open test beds for new distribution control tools for enhanced distribution system resilience.

The agreement provides up to \$5,000,000 to evaluate and identify a standard approach to modeling distributed energy resources.

OE is encouraged 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 Department is directed to support the COMMANDER (Coordinated Management of Microgrids and Networked Distributed Energy Resources) National Test Bed 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 agreement provides not less than \$15,000,000 for a demonstration project with the Department's Grid Sensors and Sensor Analytics program. The demonstration activities may focus on utilizing data from distribution utilities that have deployed advanced metering infrastructure.

The agreement provides \$10,000,000 for coordinated research, development, deployment, and training related to advanced microgrid-enabling technologies, with a focus on underserved and Indigenous communities in remote and islanded areas. The Department is directed to partner with organizations with specialized experience addressing local energy challenges, including community-based organizations and institutions of higher education, with a priority for minority-serving institutions.

Cyber Resilient and Secure Utility Communications Networks.—The agreement provides \$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.

OE is directed to coordinate with CESER on university-based research and development of scalable cyber-physical platforms for resilient and secure electric power systems that are flexible, modular, self-healing, and autonomous.

The agreement provides up to \$5,000,000 for OE to partner with utility-led facilities to evaluate and commission new distribution communications and control technologies for a secure smart grid.

GRID HARDWARE, COMPONENTS, AND SYSTEMS

Energy Storage.—The agreement provides not less than \$20,000,000 for a competitive pilot demonstration grant program, as authorized in section 3201 of the Energy Act of 2020, for energy storage projects that are U.S.-controlled, U.S.-made, and North American sourced and supplied. The Department is directed to include in this program large scale commercial development and deployment of long cycle life, lithium-grid scale batteries and their components.

Transformer Resilience and Advanced Components.—The agreement provides up to \$5,000,000 for the Grid Research Integration and Demonstration Center.

The Department is directed to develop a high voltage direct current (HVDC) moon-shot initiative to support research and development to reduce the costs of HVDC technology and long-distance transmission, including for nascent superconducting technology.

The Department is encouraged to conduct research to reduce costs associated with high voltage direct current converter stations. The agreement recognizes the Department's role in the development of a standardized power electronic converter applied across a range of grid applications, coupled with the need to reduce transmission costs and improve reliability through advanced technological research. The agreement emphasizes the security and economic imperative of fostering and maintaining a robust domestic supply chain of transformers and components, including the largest capacity transformers.

The agreement reiterates concerns about the escalating cost of rebuilding utility infrastructure in regions subject to the effects of extreme weather and climate change and considers the most appropriate strategy to rebuild federally funded utility infrastructure only to specifications that can withstand foreseeable environmental outcomes.

The Department is directed 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. Because there are limited viable alternatives to Sulfur Hexafluoride (SF₆) in power generation and transmission equipment above 72kV, the Department is encouraged to support research and development to advance safe and effective capture and reuse technologies for the use of SF₆ in components like circuit breakers. Below 72kV power generation and distribution equipment is fully capable of being designed and manufactured without SF₆; therefore, the Department is directed to support research and development to advance safe and effective alternatives to SF₆, including in circuit breakers, reclosers, sectionalizers, load break switches, switchgear and gas insulated lines.

GRID DEPLOYMENT

The Department is encouraged to provide public utility commissions and state energy offices with technical assistance for understanding distribution planning, interconnection, and modeling of distributed energy sources.

The Department is encouraged to deploy transmission facilities and related technologies by enhancing the reliability and resilience of the bulk power system, including HVDC transmission networks and inter-regional connections, and integrating power-generating resources into the electric grid. Further, the Department is encouraged to develop opportunities for connecting areas of high energy resources to areas of high energy demand, including offshore transmission, and for linking together transmission planning regions and other activities that would ensure deployment of bulk power across a national electric grid.

Wholesale Electricity Market Technical Assistance and Grants.—The Department is directed to provide technical and financial assistance to states and regions to develop market governance, planning and policy, and regulatory development assistance related to the formation, expansion, or improvement of grid regions to ensure a clean, reliable, resilient, and equitable grid.

NUCLEAR ENERGY

(INCLUDING TRANSFER OF FUNDS)

The agreement provides \$1,473,000,000 for Nuclear Energy.

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

The Department is reminded that it does not have authority to redirect any appropriations between control points. Transfer or reprogramming of funds requires congressional approval. The Department may not re-purpose or re-scope projects identified in control points without prior congressional notification.

The Department has not provided the report directed by the fiscal year 2022 Act related to thorium molten-salt reactors. The Department is directed to provide the report not later than 15 days after enactment of this Act.

The fiscal year 2020 Act required the Department to contract with the National Academy of Sciences on a report to study the non-proliferation and security risks and international safeguards challenges associated with advanced nuclear reactors and related fuel cycle technologies, including the fuel cycle for small modular reactors. The Department is directed to provide to the Committees not later than 90 days after enactment of this Act a report and briefing describing how it plans to implement recommendations from the report, including how it would propose to fund advanced reactors that produce lower waste yields, compared to traditional reactors.

Nuclear Energy University Program (NEUP).—The Department is directed to provide to the Committees prior to the obligation of these funds a detailed spending and execution plan for NEUP activities. The Department is directed to provide to the Committees not later than 90 days after enactment of this Act and quarterly thereafter briefings on the implementation of NEUP. Within available funds for NEUP, SBIR/STTR, and TCF, the agreement provides \$6,500,000 for the University Nuclear Leadership Program, previously funded as the Integrated University Program. The agreement supports the diversification of financial assistance it provides through the program to include supporting nontechnical nuclear research that serves to increase community participation and confidence in nuclear energy systems. Within available funds for NEUP, SBIR/STTR, and TCF, the agreement provides \$17,500,000 for University Fuel Services, previously funded as Research Reactor Infrastructure. The Department is directed to provide to the Committees not later than 180 days after enactment of this Act a report detailing the needs of university reactor refurbishments and the potential need to upgrade or build additional university reactors. The report shall include a detailed plan including total lifecycle costs and associated funding profiles for potential new university reactors. The agreement does not provide any funds for the planning and construction of new university nuclear reactors. Within available funds for NEUP, SBIR/STTR, and TCF, the agreement provides up to \$12,000,000 to revitalize existing university nuclear research infrastructure, especially in support of nuclear cyber-physical protection, new digital technologies in advanced nuclear reactors, and the development and safety assessments of small modular reactors.

Advanced Reactor Licensing.—The agreement provides up to \$5,000,000 for the Advanced Nuclear Licensing Energy Cost-Share Grant Program as authorized under 42 U.S.C. 16280.

The agreement recognizes the importance of creating a domestic graphite supply for the nuclear energy industry. The Department is encouraged to explore activities to secure a domestic supply of nuclear grade graphite at synthetic graphite facilities that are U.S.-based and U.S.-owned.

NUCLEAR ENERGY ENABLING TECHNOLOGIES

The agreement provides \$12,000,000 for integrated energy systems.

Nuclear Science User Facilities.—The agreement provides not less than \$12,000,000 for computational support.

Joint Modeling and Simulation Program.—The agreement continues the requirement that use and application of the codes and tools shall be funded by the end user, not the Joint Modeling and Simulation Program.

FUEL CYCLE RESEARCH, DEVELOPMENT, AND DEMONSTRATION

The agreement supports availability of high-assay low-enriched uranium (HALEU) and other advanced nuclear fuels, consistent with section 2001 of the Energy Act of 2020.

Advanced Nuclear Fuel Availability.—The Department is directed to conduct these activities in a manner that will encourage, rather than discourage, the private sector commercialization of HALEU production. The Department is directed to disburse these funds on a competitive basis.

The Department is encouraged to utilize a competitive solicitation process to send a signal to potential domestic and international customers that the United States strongly supports the deployment of advanced reactors on the earliest possible schedule. Upon approval from the Committee, the Department may proceed with issuing a solicitation, awarding selections, and expeditiously executing the contracts without any further delays.

The Department is directed to provide to the Committees not later than 30 days after enactment of this Act and not less than 60 days prior to the obligation of Advanced Nuclear Fuel Availability funds the report required by section 2001(b)(2) of the Energy Act of 2020. This report shall include, at a minimum, a plan for the program that includes specific milestones and timelines for completion of the program, as well as expected out-year costs.

The Department is directed to provide to the Committees not later than 30 days after enactment of this Act a report explaining how the Department plans to support the first core loads needed by the Advanced Reactor Demonstration Program (ARDP) awardees to maintain and not delay the scheduled timelines of the demonstration projects.

The Department is encouraged to ensure that all federally-funded transfers and shipments of uranium hexafluoride and depleted uranium hexafluoride shall, to the extent practicable, use American manufactured shipping cylinders and transportation casks.

Material Recovery and Waste Form Development.—The agreement provides not less than \$27,000,000 for EBR-II Processing for HALEU. The Department is encouraged to continue activities related to the ZIRCEX process.

Accident Tolerant Fuels.—The agreement provides \$114,000,000 for development of nuclear fuels with enhanced accident-tolerant characteristics to significantly mitigate the potential consequences of a nuclear accident. The agreement provides not less than \$15,000,000 for further development of silicon carbide ceramic matrix composite fuel cladding for light water reactors. The agreement notes a concern that funding for the industry-led portions of the Accident Tolerant Fuels program is not being obligated by the Department in a timely manner. The Department is reminded reallocation or repro-

gramming of funds require the Committees' approval. The Department is directed to align its contracts with the three industry-lead teams with the provided funding. The Department is directed to provide to the Committees not later than 15 days after enactment of this Act a table summarizing the allocation of fiscal year 2023 funds.

TRISO Fuel and Graphite Qualification.—The agreement provides \$10,000,000 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.

Fuel Cycle Laboratory R&D.—The agreement provides not less than \$10,000,000 for an advanced metallic fuels program.

Used Nuclear Fuel Disposition R&D.—The agreement provides \$5,000,000 for advanced reactor used fuel disposition.

The Department is directed to develop an integrated strategy between the Office of Nuclear Energy and the Office of Environmental Management to establish a road-ready, dry storage packaging configuration capability for Department-owned spent fuel. The Department is directed to provide to the Committees not later than 180 days after enactment of this Act a briefing, including participation from the Office of Nuclear Energy and the Office of Environmental Management, on an implementation strategy for these activities.

Integrated Waste Management System.—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 directed to continue site preparation activities at stranded sites, to evaluate the re-initiation of regional transport, and to undertake transportation coordination efforts.

REACTOR CONCEPT'S RESEARCH, DEVELOPMENT, AND DEMONSTRATION

Advanced Small Modular Reactor RD&D.—The agreement provides \$165,000,000 for ongoing demonstration activities. Within these funds, consistent with the budget request not more than \$30,000,000 is provided consistent with the existing cooperative agreement DENE0008928. Prior to the obligation of more than 95 percent of fiscal year 2023 funding, the Department is directed to conduct independent cost and project management analyses of ongoing demonstration activities through the Office of Clean Energy Demonstrations, similar to the demonstrations of the Advanced Reactor Demonstration Program.

Advanced Reactor Technologies.—The agreement provides not less than \$8,500,000 for Advanced Reactor Concepts and up to \$20,000,000 for MARVEL. The agreement provides not less than \$5,000,000 for continued work on the Supercritical Transformational Electric Power Research and Development. The agreement supports the collaboration between the national laboratories and industry partners to develop and validate sCO₂ power conversion specifically for modular micro-nuclear reactors by spring of 2023. This work should continue to be coordinated with the Office of Fossil Energy and Carbon Management.

ADVANCED REACTOR DEMONSTRATION PROGRAM

The Department is directed to continue to ensure the ARDP moves forward expeditiously and to clearly articulate future funding needs for the programs within the ARDP in future budget requests. The Department is directed to continue to focus resources on partners capable of project delivery in the next four to six years.

National Reactor Innovation Center.—The agreement supports capital design and construction activities for demonstration reactor test bed preparation at Idaho National Laboratory supporting advanced reactor demonstration activities.

Construction.—Funds above the request are provided to complete preliminary design and initiate construction for the Safeguards Category 1 advanced reactor testbed at the Idaho National Laboratory.

INFRASTRUCTURE

ORNL Nuclear Facilities Operations and Maintenance.—The agreement provides \$20,000,000 to be transferred to the Office of Science for the continued safe operations and maintenance of the Oak Ridge National Laboratory hot cells.

INL Facilities Operations and Maintenance.—The agreement provides \$318,924,000 for INL Facilities Operations and Maintenance.

FOSSIL ENERGY AND CARBON MANAGEMENT

The agreement provides \$890,000,000 for Fossil Energy and Carbon Management.

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

The agreement does not support the closure of any National Energy Technology Laboratory (NETL) site and provides no funds to plan, develop, implement, or pursue the consolidation or closure of any of the NETL sites.

The agreement includes not less than \$5,000,000 for integrated energy systems.

The Department is directed to continue efforts to support natural gas demand response pilot programs.

The Department is directed to support research, development, and demonstration activities to show the increased viability of renewable LPG and to pursue new production pathways from sustainable aviation fuel production, landfill waste, and animal waste.

The Department is directed to support pilot and demonstration activities for chemical looping hydrogen production and carbon capture. The Department is encouraged to support a chemical looping hydrogen production and carbon capture commercial demonstration project using natural gas, biomass, or coal to demonstrate the technical, operational, and economic advantages of chemical looping for clean hydrogen production and carbon capture.

The agreement supports the Department's efforts to offer undergraduate, graduate, and post-graduate students majoring in scientific, technology, engineering, and mathematics (STEM) disciplines the opportunity to learn about programs, policies, and research, development, demonstration, and deployment initiatives within the Office of Fossil Energy and Carbon Management.

The Department is encouraged to prioritize Carbon Capture Utilization and Storage (CCUS) funding on projects and research that look to reduce the cost of these technologies for commercial deployment.

Solid Oxide Fuel Cell Systems & Hydrogen.—The agreement provides not less than \$121,000,000 for the research, development, and demonstration of solid oxide fuel cell systems and hydrogen production, transport, storage, and use systems.

The agreement provides up to \$50,000,000 to assess solutions to decrease potential emissions of nitrogen oxides from the direct combustion of hydrogen in natural gas fired power plants.

The agreement supports the continuation of the Energy Department's Cooperative Agreements to develop cost sharing partnerships to conduct basic, fundamental, and applied research that assist industry in devel-

oping, 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.

National Carbon Capture Center.—The agreement provides funding for the Department's National Carbon Capture Center consistent with the cooperative agreement. The Department is directed to use funds within CCUS and Power Systems for research and development across a broad range of technology and fuel applications as it determines to be merited.

The agreement provides \$10,000,000 for a laboratory demonstration project for carbon-neutral methanol synthesis from direct air capture and carbon-free hydrogen production.

Interagency Working Group on Coal and Power Plant Communities.—The agreement supports the Administration's efforts to assist coal communities through their Interagency Working Group on Coal and Power Plant Communities and Economic Revitalization which is led by the Department. The agreement provides \$3,000,000 for these efforts.

CARBON MANAGEMENT TECHNOLOGIES

The Department is directed to conduct CCUS activities, including front-end engineering and design studies, large pilot projects, and demonstration projects that capture and securely store volumes of carbon dioxide from fossil energy power plants, industrial facilities, or directly from the air consistent with the objectives of title IV of the Energy Act of 2020.

The Department is encouraged to assess environmental issues that are common to carbon management infrastructure projects and, where appropriate, consider proposing criteria for required environmental reviews, in consultation with the Council on Environmental Quality, as they relate to carbon management technologies.

The Department is directed to conduct research, development, and demonstration activities, including studies and pilots, to identify categories of possible mineral and waste feedstocks across the United States suitable for use in CCUS technologies; assess the feasibility for technology deployment using such feedstocks to enable the production of low carbon cement/concretes, building materials, consumer items and other manufactured products; and identify applications and validate and quantify the low carbon attributes of these products. The Department is encouraged to carry out these activities in consultation with leading industry specialists and in collaboration with national laboratories. The Department is encouraged to continue supporting activities to assist communities in the design and construction of pilot-scale equipment and systems necessary to demonstrate CCUS at waste to energy plants.

The Department is directed to establish a program to support research and development of novel, proof-of-principle carbon containment projects with the goal of finding and de-risking methods and locations to remove atmospheric carbon dioxide that are effective, safe, low cost, and scalable. The agreement provides up to \$50,000,000 to support work at multiple sites to pursue research, development, and deployment of carbon containment technologies and proximate carbon dioxide capturing systems that also meet regional economic and ecological restoration policy goals such as catastrophic wildfire mitigation and job creation.

Carbon Capture.—The agreement provides not less than \$15,000,000 for research and optimization of carbon capture technologies at

industrial facilities and not less than \$20,000,000 for research and optimization of carbon capture technologies for natural gas power systems.

The agreement provides up to \$75,000,000 to support front-end engineering and design studies, including for the development of a first-of-its-kind carbon capture project at an existing natural gas combined cycle plant, large pilot projects, and demonstration projects. The Department is encouraged to prioritize entities that are primarily engaged in the generation of electricity from natural gas in competitive power markets.

Carbon Dioxide Removal.—The agreement provides up to \$15,000,000 for research, development and demonstration activities related to the indirect sequestration of carbon dioxide in ocean waters.

Carbon Utilization.—The agreement supports carbon utilization research, development, and demonstration activities to advance valuable and innovative uses of captured carbon, including conversion to products such as chemicals, plastics, building materials, and fuels. The Department is directed to support the evaluation of carbon utilization pathways for consideration under section 45Q of Title 26 CFR.

The Department is encouraged to support technologies that significantly improve the efficiency, effectiveness, costs, emissions reductions, and environmental performance of carbon dioxide captured from coal, natural gas, industrial facilities, and other sources to produce fuels and other valuable products.

The agreement provides not less than \$10,000,000 for research and development of carbon utilization using algal systems.

The Department is encouraged to support research and development activities in the Carbon Utilization Program to support valuable and innovative uses of captured carbon, including biological utilization by the conversion of carbon dioxide to high value products such as chemicals, plastics, building materials, curing for cement, and the integration of carbon utilization technologies with fossil fuel power plants, such as biological conversion systems.

Carbon Transport and Storage.—The agreement provides not less than \$40,000,000 for CarbonSAFE and not less than \$20,000,000 for the Regional Carbon Sequestration Partnerships (the Regional Initiatives). The Department is directed to expeditiously award the fiscal year 2022 funds and to provide the Committees regular updates on these activities.

The agreement supports the Department's efforts to support front-end engineering and design for carbon dioxide transport infrastructure necessary to deploy CCUS technologies.

Within the amounts provided for Carbon Storage, the Department is encouraged to support surveys and site characterization of promising ocean-based geologic formations, and to partner with non-federal entities with the technological capabilities to accelerate and improve this process.

Hydrogen with Carbon Management.—The Department is encouraged to support hydrogen research, development, and demonstration activities that support fossil fuel-derived hydrogen production equipped with CCUS technologies that results in significantly reduced carbon dioxide intensity. The agreement supports continued collaboration with the Office of Energy Efficiency and Renewable Energy, the Office of Electricity, and the Office of Nuclear Energy.

The agreement provides not less than \$30,000,000 for Advanced Turbines to carry out research, development, and demonstration to develop near-zero-emission advanced turbine technologies.

The agreement provides up to \$50,000,000 for materials research and development. The

Department is directed to support the development of ceramic matrix composite (CMC) materials in accordance with the CMC Manufacturing Roadmap and section 4005 of the Energy Act of 2020.

The Department is encouraged to continue work on coal and coal biomass to both liquids and solids activities and encourages the Department to focus on research and development to improve cost and efficiency of coal-to-fuels technology implementation and pyrogeneration.

The agreement provides \$1,500,000 to accelerate development and deployment of wireless sensor systems for coal-fired power generation in order to improve generative efficiency, reduce emissions, and lower maintenance costs.

The agreement supports competitively awarded research and development activities, coordinated with the Offices of Nuclear Energy and Energy Efficiency and Renewable Energy, to advance the use of supercritical power cycles.

RESOURCE TECHNOLOGIES AND SUSTAINABILITY

The agreement provides up to \$30,000,000 for the Department to assist in the discovery, identification, and characterization of undocumented orphan oil and gas wells.

Advanced Remediation Technologies.—The agreement provides up to \$20,000,000 for university research and field investigations in the Gulf of Mexico to confirm the nature, regional context, and hydrocarbon system behavior of gas hydrate deposits. The agreement provides not less than \$19,000,000 for Unconventional Field Test Sites. The Department is directed to maintain robust efforts in enhanced recovery technologies.

The agreement provides \$10,000,000 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 \$8,000,000 is available 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 agreement provides up to \$7,000,000 for the Risk Based Data Management System. The agreement supports the continued funding of the Risk Based Data Management System, and in particular, its functions under FracFocus. FracFocus should maintain its autonomy and not be incorporated into any federal agency.

Methane Mitigation Technologies.—The agreement provides \$60,000,000 for Methane Mitigation Technologies, which includes activities previously funded through Emissions Mitigation from Midstream Infrastructure and Emissions Quantification from Natural Gas Infrastructure.

The Department is encouraged to support activities to develop and demonstrate an eas-

ily implementable, maintainable, and low-cost integrated methane monitoring platform. The Department is encouraged to accelerate development and deployment of high-temperature harsh-environment sensors, sensor packaging, and wireless sensor hardware for power generation.

The Department is encouraged to collaborate with external stakeholders in making use of commercial assets to monitor methane emissions from satellites and other methane emissions detection technologies to isolate the source of emissions at the individual facility level and to explore technologies, including in coordination with public-private partnerships, that promote innovative approaches, such as detection technologies in support of reducing methane gas emissions. The agreement provides up to \$5,000,000 for advanced observational technologies, as validated in peer-reviewed publications, to globally identify and mitigate methane and volatile organic compound emissions from existing operations assisting worldwide partners and governments deploy targeted reduction measures.

Natural Gas Decarbonization and Hydrogen Technologies.—The agreement provides up to \$10,000,000 for a demonstration project focused on producing hydrogen from the processing of produced water and mineral substances and transporting hydrogen using existing energy infrastructure.

The agreement provides up to \$10,000,000 for research to develop hydrogen transportation and storage infrastructure, including the safety, mechanical integrity and regulatory impacts of blending hydrogen into existing natural gas pipelines. Comprehensive planning approaches for transitioning segments of natural gas users to increased hydrogen use should be part of the program, including analysis of the infrastructure required to transport hydrogen.

The agreement supports the Department's efforts to utilize natural gas and related infrastructure more effectively for decarbonization solutions, including research to convert natural gas, natural gas liquids and other gas streams to low-carbon, sustainable products, including chemicals and fuels, such as ammonia and hydrogen. Further, the agreement supports comprehensive planning approaches for transitioning segments of the economy using hydrogen and other low-carbon fuels. This planning should include both production, storage, and transportation of these fuels. The Department is encouraged to establish the Center for Sustainable Fuels and Chemicals at the National Energy Technology Lab.

Mineral Sustainability.—The Department is directed to submit to the Committees not later than 180 days after enactment of this Act an assessment of the vulnerabilities to the U.S. energy system from foreign reliance for critical and strategic minerals and the actions the Department is taking to bolster domestic mineral production.

The Department is directed to conduct research and development to develop and assess advanced separation technologies for the extraction and recovery of rare earth elements and other critical materials from coal and coal byproducts. Further, the Department is directed to determine and mitigate any potential environmental or public health impacts that could arise from the recovery of rare earth elements from coal-based resources. The agreement provides up to \$6,000,000 for the Department, in collaboration with the Department of Commerce and U.S. Geological Survey, to pilot a research and development project to enhance the security and stability of the rare earth element supply chain. Research should include approaches to mining of domestic rare earth elements that are critical to U.S. technology development and manufacturing, as well as emphasize environmentally responsible mining practices. The Department is encouraged to partner with universities in these efforts.

The agreement provides up to \$5,000,000 for university-led consortium for research and development of biofilm-based barrier technologies to reduce methane emissions from orphan wells.

The Department is directed 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 byproduct sources. Research should support pilot-scale and experimental activities for near-term applications, which encompass the extraction and recovery of rare earth elements and minerals.

The Department is directed to continue the Carbon Ore, Rare Earths, and Critical Minerals (CORE-CM) Program.

The agreement provides up to \$10,000,000 for utilizing coal as a precursor for high-value added products at the Carbon Fiber Technology Facility.

NETL INFRASTRUCTURE

Within available funds for NETL Infrastructure, the Department is directed to prioritize funds for Joule, site-wide upgrades for safety, and addressing and avoiding deferred maintenance.

The agreement supports the Human Resources Shared Service Center.

ENERGY PROJECTS

The agreement provides \$221,968,652 for the Energy Projects account for Community Project Funding and Congressionally Directed Spending at the Department for the following list of projects.

The Committees remind recipients that statutory cost sharing requirements may apply to these projects.

The Department may use program direction funds from the appropriate program offices to implement these projects.

Community Project Funding and Congressionally Directed Spending of Energy Projects		
Project Name	Recipient	Amount
1.2 MW Floating Solar at the Southern Regional Water Supply Facility	Orange County, FL	\$500,000
115 kW Floating Solar Project at Utilities and Customer Administration Building	Orange County, FL	\$400,000
Accelerating Hydrogen Research in NY to Support Deployment of Clean Energy and Clean Industry	University at Buffalo	\$250,000
Acidic Water Pollution Cleanup and Community Economic Development through Domestic Production of Critical Minerals for National Security	The Pennsylvania State University	\$2,100,000
Advanced Energy Research Equipment	Emery County, UT, San Rafael Energy Research Center	\$1,492,000
Advanced Separation Technologies Research	Virginia Polytechnic Institute and State University	\$1,000,000
Alaska Liquid Natural Gas Pipeline Front-End Engineering and Design (FEED)	Alaska Gasline Development Corporation	\$4,000,000
Albuquerque Public Housing Electrification	Albuquerque Housing Authority	\$1,700,000
Ambler Tank Farm	City of Ambler	\$650,000
Beaver City Hydroelectric Plant Transportation Pipeline Replacement	Beaver City Corporation, UT	\$2,000,000
Belfair Electrical Capacity Infrastructure Project	Mason County Public Utility District No. 3	\$3,000,000
BioGas Turbine Driven Blower	City of Flint	\$1,000,000
Bluefield Battery Prototyping Laboratory - Phase 1	Center for Applied Research & Technology, Inc.	\$328,000
Brandon Senior Citizens Center Solar Project	Brandon Senior Citizens Center	\$7,000
Brewer Recreational Facility Energy Modernization Project	Town of Brewer	\$232,000
Caliente - Advanced Metering Infrastructure	City of Caliente	\$148,000
California State Maritime Academy Academic Microgrid	California State University Maritime Academy	\$1,000,000
Carr Park Resilient Community Solar	City of Medford, MA	\$1,500,000
Center for Wind Energy	University of Texas at Dallas	\$1,600,000
Central Maine Community College - Renewable Energy Project	Central Maine Community College	\$500,000
Chicago Libraries Solar Power Project	City of Chicago	\$1,000,000
City of Kenosha Solar Panels	City of Kenosha	\$3,000,000
City of Madison Truax Apartment Solar Project	City of Madison	\$1,500,000
City of Racine Storage Garage Site	City of Racine	\$1,235,000
City of Santa Clara - Fire Station Microgrid Project	City of Santa Clara	\$500,000
Clark County - Energy Efficiency	Clark County	\$1,000,000
Clean Energy for Facilities Project	City of Northglenn, CO	\$800,000
Clean Energy Wayfinders Program	Hawaii State Energy Office	\$1,000,000
Clean Heat Homes	Vermont Energy Investment Corporation	\$8,500,000
Clearwater Solar Panel Project	City of Clearwater, FL	\$949,500
Combined Heat and Power System for One North Commercialization Hub	Our Katahdin	\$2,500,000
Community Lighthouse Solar and Energy Storage Resilience	Together New Orleans	\$3,800,000

Community Project Funding and Congressionally Directed Spending of Energy Projects		
Project Name	Recipient	Amount
Como Park Zoo and Conservatory Hydro Geothermal Heat Pump	City of Saint Paul, MN	\$2,200,000
Craig Energy Center Feasibility Study	Tri-State Generation and Transmission, Inc.	\$200,000
Critical Mineral Analytical Training Center	University of California Riverside	\$2,000,000
Cyber-PERTT Technology	Louisiana State University	\$1,000,000
Cybersecurity Center for Offshore Wind energy	Old Dominion University	\$1,000,000
Cybersecurity Consortium for Innovation, University of Arkansas Little Rock	University of Arkansas at Little Rock	\$5,000,000
Decatur Police Department Energy Improvement Project	City of Decatur, Georgia	\$500,000
Denver and Arapahoe Disposal Site Renewable Natural Gas	City and County of Denver	\$150,000
District Energy Solar and Geothermal Improvements in Rochester, MN	City of Rochester	\$2,000,000
Edward Fenn Elementary School Solar Project	Gorham Randolph Shelburne Cooperative School Dist.	\$100,000
El Paso County LED Retrofit Energy Efficiency Project	El Paso County	\$445,000
El Paso International Airport Solar Covered Parking Project	City of El Paso, TX	\$1,750,000
Electric Power Testbed to Secure the U.S. Power Grid against Cyber Attacks	University of Tulsa	\$1,500,000
Electric Vehicle Automotive Certification Expansion	Southern Maine Community College	\$750,000
Electric Vehicle Charging Hubs with Energy Storage and Floating Solar	Orlando Utilities Commission, FL	\$3,000,000
Electrifying Homes in Low-Income Areas of Santa Fe	City of Santa Fe	\$250,000
Emergency Shelter Improvements in Madison, Connecticut	Town of Madison	\$1,000,000
Energy Assessments for Low Income Neighborhoods and Disadvantaged Communities	City of Ithaca	\$1,500,000
Energy DELTA Lab - Project Oasis	Energy DELTA Lab	\$1,500,000
Energy Efficiency and Renewable Energy Upgrades	Leahy Center for Lake Champlain, Inc.	\$1,600,000
Energy Efficient Retrofits	The Groden Network	\$250,000
Energy Efficient Upgrades	Providence Performing Arts Center	\$750,000
Energy Improvements for Rhode Island Public Buildings	Rhode Island Office of Energy Resources	\$5,000,000
Energy Improvements of Fire Stations	City of Shawnee, KS	\$126,750
Enhanced Grid Cybersecurity Threat and Vulnerability Management	JEA	\$400,000
Enhanced Treatment and Site Upgrade Campus Solar Project	Union Sanitary District	\$2,150,000
Enhancing the Royal Oak Farmers Market as a Community Resiliency Hub	City of Royal Oak	\$411,000
Euclid Microgrid	Cuyahoga County	\$1,500,000
Forging Oregon's Renewable Energy Source Transition Through Reimagining Education + Energy (FOREST TREE)	Southern Oregon University	\$2,000,000
Fremont Municipal Critical Facility Resilience Battery Systems	East Bay Community Energy	\$1,000,000
Georgia Hydrogen Testing Consortium	Georgia Institute of Technology	\$4,000,000
Geothermal Heating and Cooling System	Aquarium of Niagara	\$694,925
Golden Gate National Recreation Area Solar Energy Production and Storage Project	Golden Gate National Parks Conservancy	\$3,000,000
Green Era Anaerobic Digester	Green Era Educational NFP	\$3,888,000

Community Project Funding and Congressionally Directed Spending of Energy Projects		
Project Name	Recipient	Amount
Green Hydrogen Laboratory Equipment	Colorado School of Mines	\$3,000,000
Ground Mount Solar	Town of Stratford	\$67,000
Hardwood Cross Laminated Timbers for Energy Efficient Modular Homes	West Virginia University	\$1,200,000
Hayward Municipal Critical Facility Resilience Solar and Energy Storage	East Bay Community Energy	\$1,000,000
Historic Colonial Theatre Clean Energy Solar Array	Bethlehem Redevelopment Association	\$51,000
Ho'ahu Energy Cooperative Molokai's community-based renewable energy	Ho'ahu Energy Cooperative Molokai	\$3,000,000
Hydrogen Academic Programs to Enhance the Hydrogen Economy	University of Toledo	\$3,000,000
Hydrogen Electrolyzer Performance Research	Emery County, UT, San Rafael Energy Research Center	\$1,080,000
Hydrogen Infused Active Energy Emission Technology	Louisiana Tech University	\$1,100,000
Hydrokinetic Power System	City of False Pass	\$1,250,000
Largo Public Library Solar Installation Project	City of Largo, FL	\$265,000
Lincoln County Power District - Solar	Lincoln County Power District	\$1,750,000
Liquified Natural Gas Opportunity Study	Greene County Industrial Developments, Inc.	\$500,000
Low- and Moderate-Income Building Electrification	Montgomery County Maryland	\$1,000,000
Lower Willow Creek Micro-Hydro Electric Generation Project	City of Creede	\$425,000
Luzerne County Transportation Authority Solar Panel Installation	Luzerne County Transportation Authority	\$625,000
Marin Clean Energy Storage Program	Marin Clean Energy	\$500,000
Marine Energy Feasibility Study for Remote Alaskan Villages	Alaska Village Electric Cooperative, Inc.	\$1,500,000
Marjorie Post Community Park Solar Panels Project	Town of Oyster Bay, NY	\$1,000,000
Martin Luther King, Jr. Community Center Solar Panels	City of Dallas, TX, Office of Community Care	\$2,000,000
Maywood Community Resilience Center Energy Storage Project	City of Maywood, CA	\$250,000
Mecca and North Shore Electric Infrastructure Resiliency Project	Imperial Irrigation District	\$1,200,000
Medford Irrigation District Community Solar	Medford Irrigation District	\$1,120,000
Memorial Pools Energy Efficiency Retrofits	National September 11 Memorial and Museum	\$700,000
Midstream Critical Manufacturing Industry Cybersecurity Hub	Sul Ross State University	\$2,500,000
Millcreek Battery Project	City of Saint George, UT, Utility Department	\$1,000,000
Milpitas Carbon Neutral Homes Retrofit Program	City of Milpitas, CA	\$3,000,000
Model Regional Operations Center to Enhance the Cyber Security of the U.S. Electricity Sector	Auburn University	\$10,000,000
MultiCare Mary Bridge Hospital Electrical Infrastructure	MultiCare Mary Bridge Children's Hospital	\$5,500,000
Net-Zero Emissions at Public Schools in Manchester, CT	Town of Manchester	\$1,900,000
New Mexico State University Agrivoltaics Research Program	New Mexico State University	\$844,000
New River Feeder Electrical Substation	City of Fallon, NV	\$879,835
Northwestern Michigan College Campus Geothermal Project	Northwestern Michigan College	\$2,700,000
Omaha Public Power District Grid Resiliency and Modernization	Omaha Public Power District	\$7,787,500

Community Project Funding and Congressionally Directed Spending of Energy Projects		
Project Name	Recipient	Amount
Opportunity of Hope for Mental Health Solar Array	Monadnock Family Services	\$397,000
Pinewood Springs Energy Resiliency Microgrid	Poudre Valley Rural Electric Association	\$425,000
Port of Hueneme Comprehensive Climate Action and Adaptation Plan	Port of Hueneme, Oxnard Harbor District, CA	\$375,000
Quincy Solar Farm Project	City of Quincy	\$1,400,000
Regional Clean Electricity Plan for Local Governments in Metro Atlanta	Atlanta Regional Commission	\$750,000
Renewable Energy for Cold Storage Facility	Feeding America Tampa Bay Incorporated	\$2,258,992
Renewable Energy Outdoor Workforce Laboratory	Manchester Community College	\$1,000,000
Resilient Power for Community Health Centers	Clean Energy Group, Inc	\$500,000
Rindge Recreation Light Replacement	Rindge Recreation Department	\$138,000
Riverbank Community Center Microgrid Project	City of Riverbank, CA	\$2,500,000
Roof-Top Solar Array Gorham Public Works Garage	Town of Gorham	\$89,000
Savanna Industrial Park Anaerobic Digester	Jo-Carroll Local Redevelopment Authority	\$4,000,000
Schenectady Community Virtual Power Plant	City of Schenectady, NY	\$1,000,000
Scott Valley Biomass Utilization Project	Northern California Resource Center	\$1,000,000
SmartFlower Solar Installation and Renewable Energy Programming	Girl Scouts of the Colonial Coast	\$15,000
SMUD Neighborhood Electrification Project	Sacramento Municipal Utility District	\$3,000,000
Solar and Smart Grid Modernization at the Solar Energy Park	City of Ellensburg, WA	\$1,500,000
Solar Array for Higher Education	Lake Washington Institute of Technology	\$1,100,000
Solar at Capitol Market	Capitol Market Inc.	\$713,000
Solar Energy and Affordable Housing in Barrington and Keene	NH Community Loan Fund	\$750,000
Solar Energy Demonstration Project for Public Libraries	South Hero Library Foundation	\$57,000
Solar Energy Sustainability Project	Shelter Partnership	\$1,500,000
Solar Panel Installation at Department of Public Works Canopy	Township of Piscataway	\$250,000
Solar Panel Installation at Goucher College	Goucher College	\$750,000
Solar Panel Installations on Town Facilities	Town of Morrisville, NC	\$250,000
Solar Panels at Childcare Center	Children's Community Development Center, Inc.	\$165,000
Solar Workforce Training Lab	IMPACT Community Action	\$650,000
South Coast Air Quality Management District: Zero Emission Fuel Cell Locomotive	South Coast Air Quality Management District	\$500,000
Southeast Texas Data Analytics and Cybersecurity for Energy Supply Chain Resilience Project	Lamar University	\$2,000,000
St. Louis Park Electrify Community Cohort Grant Program	City of St. Louis Park	\$1,000,000
Stamford LED Streetlighting Project	City of Stamford	\$2,000,000
Sustainability Education Center for Education and Workforce Development	City of Anaheim, CA	\$3,000,000
Testbed for Clean Energy and Grid Modernization	New Mexico State University	\$1,600,000
Tompkins County EV ARC	Tompkins County	\$128,000

Community Project Funding and Congressionally Directed Spending of Energy Projects		
Project Name	Recipient	Amount
Town Hall - Energy Efficiency Upgrades	Town of Lincoln	\$125,000
Town of DeWitt Hydrogen Fueling Station	Town of DeWitt	\$280,000
Town of Hamden Administrative Building Energy Efficiency Improvements	Town of Hamden, CT	\$600,000
Town of Wardensville Photovoltaic Solar Field	Town of Wardensville	\$375,000
Transit Station Solar Energy and EV Charging Demonstration Project	SouthWest Transit	\$1,854,150
UCLA SeaChange: Carbon Sequestration Pilot	University of California Los Angeles	\$1,600,000
Unalaska Aging Infrastructure Replacement	City of Unalaska	\$2,500,000
University of Akron Research Foundation Managed Sustainable Electric Powered System for Summit County Multi-Unit Affordable Sustainable Housing	University of Akron Research Foundation	\$1,125,000
University of Nevada, Reno - Lithium Characterization Analysis	University of Nevada, Reno	\$1,600,000
University of Tulsa CO2 Transportation and Storage	University of Tulsa	\$1,250,000
University of Tulsa Produced Water Treatment using Compact Separator System	University of Tulsa	\$1,500,000
University of Tulsa Utilization of Existing Pipelines in Hydrogen Transport	University of Tulsa	\$1,250,000
Water Facilities Hydroelectric and Solar Project	City of Tampa, FL	\$2,000,000
West Virginia Regional Technology Energy Efficiency and Decarbonization Project	West Virginia Regional Technology Park Corporation	\$328,000
Willowbrook Wildlife Center Efficiency Improvements	Forest Preserve District of DuPage County, IL	\$2,000,000
Wilmington Electric Vehicle Direct Current Fast Charging Stations with Renewable Energy	City of Wilmington, IL	\$750,000
YMCA of Greater Nashua Solar Panel Installation	YMCA of Greater Nashua	\$459,000
YWCA Kauai solar-plus-storage resilience project	YWCA Kauai	\$110,000

The agreement includes \$25,000,000 for NSRC Recapitalization and not less than \$25,000,000 for NSLS-II Experimental Tools-II.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

The agreement includes not less than \$405,000,000 for Biological Systems Science and not less than \$425,000,000 for Earth and Environmental Systems Sciences.

The agreement provides up to \$20,000,000 to support low-dose radiation research. The Department is directed to coordinate this work with the Office of Environment, Health, Safety, and Security.

The agreement provides not less than \$110,000,000 for the Bioenergy Research Centers to accelerate research and development needed for advanced fuels and products.

The Department is directed to maintain Genomic Science as a top priority, and the agreement provides not less than \$109,000,000 for Foundational Genomics Research. Further, the agreement includes not less than \$45,000,000 for Biomolecular Characterization and Imaging Science. The agreement provides not less than \$90,000,000 for the Joint Genome Institute.

The Department is directed to support activities to advance Artificial Intelligence for Earth System Processes (AI4ESP) for integrating diverse observations and models, with a focus on water cycles, extreme hydrology in vulnerable watersheds critical for U.S. water resilience in a changing climate, and atmospheric cloud aerosols.

The Department is directed to support activities to develop integrated mountainous hydroclimate modeling and observational capabilities. The Department is directed to leverage activities supported by other federal agencies who are also active in investigating how the 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.

The Department is encouraged to support activities for academia to perform independent evaluations of climate models using existing data sets and peer-reviewed publications of climate-scale processes in order to determine various models' ability to reproduce the actual climate.

The agreement provides \$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, by leveraging national laboratories' assets as well as local infrastructure and expertise at universities and other research institutions. The Department is directed to provide the ten-year research plan to the Committees not later than 30 days after enactment of this Act.

The agreement provides not less than \$36,000,000 to improve the understanding of key cloud, aerosol, precipitation, and radiation processes. The Department is encouraged to coordinate with the Department of Homeland Security to improve modernization and adaptation of capabilities from the National Infrastructure Simulation and Analysis Center to support climate impacts on infrastructure and communities. The Department is encouraged, in cooperation with other agencies as relevant, to implement a pilot program providing instrumentation for observing marine aerosols, greenhouse gases, and other environmental factors as relevant, deployed on commercial or other non-dedicated ocean vessels, and to evaluate a sustained observing network using such platforms. The agreement notes support for the Department's activities to support the previously-directed five-year plan and accompanying scientific assessment led by the Of-

fice of Science and Technology Policy on solar and other climate interventions.

The agreement supports the development and prototyping of fabricated ecosystem testbeds, sensing systems and data capabilities to enable interrogation of biological-environmental interactions across molecular to ecosystem-relevant scales under controlled laboratory conditions and through remote connections to field observatories.

The agreement provides \$2,000,000 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 agreement provides not less than \$120,000,000 for Environmental System Science.

The Department is directed to continue to support the Environmental System Science Focus Areas and enabling infrastructure, such as the SPRUCE manipulation site and management of the AmeriFLUX project.

The Department is directed to give priority to optimizing the operation of Biological and Environmental Research User Facilities. The agreement provides not less than \$65,000,000 for operation of the Environmental and Molecular Sciences Laboratory and supports investment in the microbial molecular phenotyping capability project. The agreement supports activities for the Atmospheric Radiation Measurement (ARM) User Facility.

FUSION ENERGY SCIENCES

The Department is directed to follow and embrace the recommendations of the Fusion Energy Sciences Advisory Committee's "Powering the Future: Fusion and Plasmas" report, and the Committees' endeavor to provide funding that reflects the prioritization developed through the community's consensus process. The Department is directed to include an explanation in future budget requests how the Department is aligning its Fusion Energy Sciences program with the recommendations of the "Powering the Future: Fusion and Plasmas" report.

The agreement provides not less than \$45,000,000 for Theory & Simulation and not less than \$81,000,000 for Burning Plasma Science Long Pulse.

The agreement provides not less than \$104,000,000 for NSTX-U, including NSTX-U Operations and NSTX-U Research.

The agreement provides not less than \$130,000,000 for DIII-D, including DIII-D Operations and DIII-D Research. The Department is encouraged to support activities to enable completion of planned facility enhancements, revitalization of critical equipment, and critical new tools to address critical research needs and secure U.S. leadership in support of ITER and a potential future fusion pilot plant. The Department is encouraged to provide increased research operations and enable broader participation in the DIII-D program by university researchers and graduate students, to fully exploit the world leading capabilities developed at the facility. Further, the Department is encouraged to support training activities at DIII-D for the next generation of fusion scientists.

The agreement includes not less than \$25,000,000 for the Milestone-Based Development Program.

The Department is encouraged to prioritize high-performance computation activities for fusion energy research.

The agreement provides up to \$32,000,000 for the High-Energy-Density Laboratory Plasmas to advance cutting-edge research in extreme states of matter, support and expand the capabilities of the LaserNetUS facilities, and continue investments in new in-

tense, ultrafast laser technologies and facilities needed to implement the recommendations of the Brightest Light Initiative Workshop Report in order to retain U.S. leadership in these fields.

The agreement provides not less than \$14,000,000 for the Materials Plasma Exposure eXperiment.

The agreement provides \$5,000,000 to support research for facility enhancements and new development and test facilities for university-based fusion experiments.

The agreement provides \$242,000,000 for the ITER project. Within available funds for ITER, the agreement provides not less than \$70,000,000 for cash contributions.

The Department is encouraged to develop and support a national team for ITER research, operations, and commissioning, which is required to take full advantage of ITER when it is completed.

The agreement includes no direction regarding the FY22 required ITER information.

HIGH ENERGY PHYSICS

The agreement provides not less than \$35,000,000 for the Sanford Underground Research Facility. The agreement includes up to \$10,000,000 for the Cosmic Microwave Background-Stage 4.

The Department is encouraged to fund facility operations at levels for optimal operations. The Department is encouraged to fund facility operations and MIEs at optimal levels.

NUCLEAR PHYSICS

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

The agreement provides not less than \$20,000,000 for other project costs for the Electron Ion Collider.

ISOTOPE R&D AND PRODUCTION

The agreement provides up to \$4,000,000 to increase their inventory of Sr-90 in light of the nation's growing demand for Sr-90 for multiple applications.

WORKFORCE DEVELOPMENT FOR TEACHERS AND SCIENTISTS

The Department is encouraged to continue to work with 2-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.

NUCLEAR WASTE DISPOSAL

The agreement provides \$10,205,000 for Nuclear Waste Disposal for Nuclear Waste Fund (NWF) oversight activities, which is derived from the NWF.

The Department is directed to provide to the Committees not later than 90 days after enactment of this Act a briefing on anticipated future-year requirements for NWF oversight activities.

TECHNOLOGY TRANSITIONS

The agreement provides \$22,098,000 for Technology Transitions.

The agreement provides not less than \$5,000,000 to support the Energy Program for Innovation Clusters Program.

The Department is directed to provide the Committees not later than 180 days after enactment of this Act a report outlining the office's five-year roadmap to achieving its goal of commercializing the Department's technology.

CLEAN ENERGY DEMONSTRATIONS

The agreement provides \$89,000,000 for Clean Energy Demonstrations.

The agreement notes support for the Department's activities to build capacity to implement large-scale funding opportunities

as well as prepare for long-term operation of the office. The Office of Clean Energy Demonstrations (OCED) represents an opportunity for the Department to provide dedicated expertise and focus to successfully implement large-scale, pre-commercial clean energy technology demonstrations. The Department is encouraged to prioritize technology demonstrations for the highest emitting sectors.

The agreement notes support for the Department's efforts to demonstrate the technical and economic viability of carrying out alternative energy projects on current and former mine land compatible in a manner with existing operations.

The Department is directed to continue to provide the Committees quarterly briefings on efforts to conduct administrative and project management activities for technology demonstrations.

The Department is directed to conduct OCED activities on a competitive basis and include cost-share requirements pursuant to section 988 of the Energy Policy Act of 2005. The Department is encouraged to conduct these activities through technology neutral solicitations focused on crosscutting energy challenges. It is expected that the Department avoid the practice of making awards dependent on funding from future years' appropriations.

ADVANCED RESEARCH PROJECTS AGENCY— ENERGY

The agreement provides \$470,000,000 for the Advanced Research Projects Agency—Energy.

The budget request proposes to expand ARPA-E's scope to focus on climate innovations, adaptation, and resilience. The agreement notes that ARPA-E already has the ability to fund this work through section 5012 of the America COMPETES Act. This includes climate-related innovations, and further, the agreement notes that ARPA-E already funds such activities.

TITLE 17 INNOVATIVE TECHNOLOGY LOAN GUARANTEE PROGRAM

The agreement provides a net appropriation of \$31,206,000 in administrative expenses for the Title 17 Innovative Technology Loan Guarantee Program.

As provided in 42 U.S.C. 16511, the Secretary may make guarantees under this section only for projects that avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases and employ new or significantly improved technologies as compared to commercial technologies in service in the United States upon issuance of the loan guarantee.

ADVANCED TECHNOLOGY VEHICLES MANUFACTURING LOAN PROGRAM

The agreement provides \$9,800,000 for the Advanced Technology Vehicles Manufacturing Loan Program.

TRIBAL ENERGY LOAN GUARANTEE PROGRAM

The agreement provides \$4,000,000 for the Tribal Energy Loan Guarantee Program.

INDIAN ENERGY POLICY AND PROGRAMS

The agreement provides \$75,000,000 for Indian Energy Policy and Programs.

The agreement provides up to \$45,000,000 to advance technical assistance, demonstration, and deployment of clean energy for households and communities in tribal nations to improve reliability, resilience, and alleviate energy poverty.

The agreement provides up to \$8,000,000 for coordinated research, development, deployment, and training related to advanced microgrid-enabling technologies, with a focus on underserved and Indigenous communities in remote and islanded areas.

The Department is encouraged to use its cost share waiver authority under section

2602 of the Energy Policy Act of 1992, as modified by section 8013 of the Energy Act of 2020, when appropriate.

The Department is encouraged to partner with organizations with specialized experience addressing local energy challenges, including community-based organizations and institutions of higher education, with a priority for minority-serving institutions.

The agreement notes support for the Office of Indian Energy's efforts to utilize local Subject Matter Experts to assist Indian Tribes and Alaska Native Villages in development energy projects and providing support for energy planning.

The Department is encouraged to design funding opportunity announcements that do not exclude tribes based on local land ownership structures, consistent with expanded authority under section 2602 of the Energy Policy Act of 1992, as modified by section 8013 of the Energy Act of 2020.

DEPARTMENTAL ADMINISTRATION

The agreement provides \$283,000,000 for Departmental Administration.

Control Points.—The agreement includes eight reprogramming control points in this account to provide flexibility in the management of support functions. The Other Departmental Administration activities include Management, Project Management Oversight and Assessments, Chief Human Capital Officer, Office of Small and Disadvantaged Business Utilization, General Counsel, Office of Policy, and Public Affairs. The Department is directed to continue to submit a budget request that proposes a separate funding level for each of these activities.

Chief Information Officer.—The agreement provides not less than \$125,000,000 for cybersecurity and cyber modernization across the Department. The agreement provides up to \$10,000,000 for the IM Office of Architecture, Engineering, Technology, and Innovation to expand low-code application development across the Department and establish a Low-Code Platform Factory that improves the efficiency of custom application development, improves cybersecurity posture, reduces operation and maintenance costs associated with legacy applications, and empowers Department personnel who are closest to problems to create solutions, selecting low-code application development options that are most appropriate for each mission need pursuant to IM's market research.

International Affairs.—The agreement provides \$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.

Other Departmental Administration.—The agreement provides not less than \$35,000,000 for the Chief Human Capital Officer, not less than \$13,500,000 for Project Management Oversight and Assessments, and not less than \$20,000,000 for the Office of Policy.

U.S. Energy and Employment Report.—The Department is directed to continue to complete an annual 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 relating 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.

The agreement is supportive of the work on the CIO Business Operations Support Services (CBOSS) program, and the Department is directed to provide regular updates on any developments regarding this effort.

The Arctic Energy Office is encouraged to explore the feasibility, scalability, and po-

tential commercialization of utilizing data server waste heat from immersion cooling technologies as a heat source for integration with other renewable energy resources for heat pump district heating purposes.

OFFICE OF THE INSPECTOR GENERAL

The agreement provides \$86,000,000 for the Office of the Inspector General.

The Inspector General is directed to continue providing quarterly briefings to the Committees on implementation of the independent audit strategy.

ATOMIC ENERGY DEFENSE ACTIVITIES

NATIONAL NUCLEAR SECURITY ADMINISTRATION

The agreement provides \$22,162,564,000 for the National Nuclear Security Administration (NNSA). The agreement 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. The agreement supports continuing important efforts to secure and permanently eliminate remaining stockpiles of nuclear and radiological materials both here and abroad to reduce the global danger from the proliferation of weapons of mass destruction. The agreement also supports Naval Reactors and the important role they play in enabling the Navy's nuclear fleet.

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 agreement commends the NNSA for considerable progress made to recruit and retain this unique workforce but reminds NNSA to remain within authorized staffing levels in the coming fiscal year.

The agreement notes concern with NNSA's lack of transparency and inability to proactively communicate with the Committees. NNSA is directed to provide to the Committees not later than 30 days after enactment of this Act a briefing on its plan for improved communication and outreach with the Committees.

NNSA Reorganization.—The agreement notes concern that NNSA has not clearly defined a compelling rationale that justifies its May 2022 announced reorganization. Reorganizations are often disruptive to work and difficult on the workforce, which in turn can decrease overall performance and productivity. Further, NNSA's high-level goals for the reorganization are unspecific, and NNSA may find it difficult to determine whether the reorganization is successful. NNSA should take additional action while it continues to implement its July 2022 reorganization.

Therefore, NNSA is directed to establish not later than 90 days after enactment of this Act specific goals and performance measures for its July 2022 reorganization. NNSA is further directed to report to the Committees not later than one year after enactment of this Act and annually thereafter for five years on its progress to meeting the specific goals for the July 2022 reorganization using the established performance measures.

Enhanced Mission Delivery Initiative.—The agreement recognizes the unique challenges associated with the operations of the nuclear security enterprise. Given its current workload, recruiting and retention concerns, and the importance of the relationship between the federal personnel and the M&O contractors, NNSA action on recommendations in its recent Enhanced Mission Delivery Initiative (EMDI) may be prudent. Prior to NNSA's implementation of any EMDI recommendations, the Comptroller General of the United States is directed to evaluate the

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
ENERGY PROGRAMS					
ENERGY EFFICIENCY AND RENEWABLE ENERGY					
Sustainable Transportation:					
Vehicle Technologies.....	420,000	602,731	455,000	+35,000	-147,731
Bioenergy Technologies.....	262,000	340,000	280,000	+18,000	-60,000
Hydrogen and Fuel Cell Technologies.....	157,500	186,000	170,000	+12,500	-16,000
Subtotal, Sustainable Transportation.....	839,500	1,128,731	905,000	+65,500	-223,731
Renewable Energy:					
Solar Energy Technologies.....	290,000	534,575	318,000	+28,000	-216,575
Wind Energy Technologies.....	114,000	345,390	132,000	+18,000	-213,390
Water Power Technologies.....	162,000	190,500	179,000	+17,000	-11,500
Geothermal Technologies.....	109,500	202,000	118,000	+8,500	-84,000
Renewable Energy Grid Integration.....	40,000	57,730	45,000	+5,000	-12,730
Subtotal, Renewable Energy.....	715,500	1,330,195	792,000	+76,500	-538,195
Energy Efficiency:					
Advanced Manufacturing.....	416,000	582,500	450,000	+34,000	-132,500
Building Technologies.....	307,500	392,000	332,000	+24,500	-60,000
Federal Energy Management Program.....	40,000	---	---	-40,000	---

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
Weatherization and Intergovernmental Program:					
Weatherization:					
Weatherization Assistance Program.....	313,000	---	---	-313,000	---
Training and Technical Assistance.....	6,000	---	---	-6,000	---
Weatherization Readiness Fund.....	15,000	---	---	-15,000	---
Subtotal, Weatherization.....	334,000	---	---	-334,000	---
State Energy Program.....	63,000	---	---	-63,000	---
Local Government Energy Program.....	10,000	---	---	-10,000	---
Energy Future Grants.....	20,000	---	---	-20,000	---
Subtotal, Weatherization and Intergovernmental Program.....	427,000	---	---	-427,000	---
Subtotal, Energy Efficiency.....	1,190,500	974,500	782,000	-408,500	-192,500
State and Community Energy Programs:					
Weatherization:					
Weatherization Assistance Program.....	---	---	326,000	+326,000	+326,000
Training and Technical Assistance.....	---	---	10,000	+10,000	+10,000
Weatherization Readiness Fund.....	---	---	30,000	+30,000	+30,000
Subtotal, Weatherization.....	---	---	366,000	+366,000	+366,000

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
State Energy Program.....	---	---	66,000	+66,000	+66,000
Local Government Energy Program.....	---	---	12,000	+12,000	+12,000
Energy Future Grants.....	---	---	27,000	+27,000	+27,000
Subtotal, State and Community Energy Programs...	---	---	471,000	+471,000	+471,000
Manufacturing and Energy Supply Chains:					
Facility and Workforce Assistance.....	---	---	16,000	+16,000	+16,000
Energy Sector Industrial Base Technical Assistance	---	---	2,000	+2,000	+2,000
Subtotal, Manufacturing and Energy Supply Chains	---	---	18,000	+18,000	+18,000
Federal Energy Management Program:					
Federal Energy Management.....	---	---	29,000	+29,000	+29,000
Federal Energy Efficiency Fund.....	---	---	14,000	+14,000	+14,000
Subtotal, Federal Energy Management Program.....	---	---	43,000	+43,000	+43,000
Corporate Support:					
Facilities and Infrastructure:					
National Renewable Energy Laboratory (NREL).....	140,000	210,100	160,000	+20,000	-50,100
21-EE-001, Energy Materials Processing at Scale (EMAPS).....	8,000	60,000	45,000	+37,000	-15,000
23-TBD, South Table Mountain (STM) Carbon Free District Heating/Cooling.....	---	31,500	---	---	-31,500
Subtotal, Facilities and Infrastructure.....	148,000	301,600	205,000	+57,000	-96,600
Program Direction	209,453	224,474	223,000	+13,547	-1,474

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
Strategic Programs.....	20,000	59,385	21,000	+1,000	-38,385
Subtotal, Corporate Support.....	377,453	585,459	449,000	+71,547	-136,459
Subtotal, Energy Efficiency and Renewable Energy..	3,122,953	4,018,885	3,460,000	+337,047	-558,885
Congressionally Directed Spending.....	77,047	---	---	-77,047	---
TOTAL, ENERGY EFFICENCY AND RENEWABLE ENERGY.....	3,200,000	4,018,885	3,460,000	+260,000	-558,885
STATE AND COMMUNITY ENERGY PROGRAMS					
Weatherization:					
Weatherization Assistance Program.....	---	362,170	---	---	-362,170
Training and Technical Assistance.....	---	10,000	---	---	-10,000
Weatherization Readiness Fund.....	---	30,000	---	---	-30,000
LIHEAP Advantage Pilot.....	---	100,000	---	---	-100,000
Subtotal, Weatherization.....	---	502,170	---	---	-502,170

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
State Energy Program.....	---	70,000	---	---	-70,000
Local Government Energy Program.....	---	25,000	---	---	-25,000
Energy Future Grants.....	---	105,000	---	---	-105,000
Program Direction.....	---	24,727	---	---	-24,727
TOTAL, STATE AND COMMUNITY ENERGY PROGRAMS.....	---	726,897	---	---	-726,897
MANUFACTURING AND ENERGY SUPPLY CHAINS					
Facility and Workforce Assistance.....	---	18,000	---	---	-18,000
Energy Sector Industrial Base Technical Assistance....	---	3,000	---	---	-3,000
Program Direction.....	---	6,424	---	---	-6,424
TOTAL, MANUFACTURING AND ENERGY SUPPLY CHAINS.....	---	27,424	---	---	-27,424
FEDERAL ENERGY MANAGEMENT PROGRAM					
Federal Energy Management.....	---	38,150	---	---	-38,150
Federal Energy Efficiency Fund.....	---	60,000	---	---	-60,000
Net-Zero Laboratory Initiative.....	---	57,000	---	---	-57,000
Program Direction.....	---	14,511	---	---	-14,511
TOTAL, FEDERAL ENERGY MANAGEMENT PROGRAM.....	---	169,661	---	---	-169,661

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE					
Risk Management Technology and Tools.....	129,804	125,000	125,000	-4,804	---
Response and Restoration.....	18,000	24,000	23,000	+5,000	-1,000
Preparedness, Policy, and Risk Analysis.....	19,000	28,000	26,857	+7,857	-1,143
Program Direction.....	16,000	25,143	25,143	+9,143	---
Congressionally Directed Spending.....	3,000	---	---	-3,000	---
TOTAL, CYBERSECURITY, ENERGY SECURITY, AND EMERGENCY RESPONSE.....	185,804	202,143	200,000	+14,196	-2,143
ELECTRICITY					
Grid Controls and Communications:					
Transmission Reliability and Resilience.....	26,000	37,300	34,000	+8,000	-3,300
Energy Delivery Grid Operations Technology.....	23,000	39,000	31,000	+8,000	-8,000
Resilient Distribution Systems.....	55,000	50,000	55,000	---	+5,000
Cyber Resilient and Secure Utility Communications Networks.....	11,150	20,000	15,000	+3,850	-5,000
Subtotal, Grid Controls and Communications.....	115,150	146,300	135,000	+19,850	-11,300

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request

Grid Hardware, Components, and Systems:					
Energy Storage:					
Research.....	73,000	81,000	95,000	+22,000	+14,000
Construction: 20-0E-100 Grid Storage Launchpad....	47,000	---	---	-47,000	---
Subtotal, Energy Storage.....	120,000	81,000	95,000	-25,000	+14,000

Transformer Resilience and Advanced Components.....	11,000	22,500	27,500	+16,500	+5,000
Applied Grid Transformation Solutions.....	---	30,000	10,000	+10,000	-20,000
Subtotal, Grid Hardware, Components, and Systems	131,000	133,500	132,500	+1,500	-1,000

Grid Deployment:					
Grid Planning and Development.....	---	---	16,000	+16,000	+16,000
Grid Technical Assistance.....	---	---	25,000	+25,000	+25,000
Wholesale Electricity Market Technical Assistance and Grants.....	---	---	16,500	+16,500	+16,500
Interregional and Offshore Transmission Planning....	---	---	2,000	+2,000	+2,000
Subtotal, Grid Deployment.....	---	---	59,500	+59,500	+59,500

Transmission Permitting and Technical Assistance.....	8,000	---	---	-8,000	---
Program Direction.....	20,000	17,586	23,000	+3,000	+5,414
Congressionally Directed Spending.....	2,850	---	---	-2,850	---
TOTAL, ELECTRICITY.....	277,000	297,386	350,000	+73,000	+52,614
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(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
GRID DEPLOYMENT OFFICE					
Grid Planning and Development.....	---	16,200	---	---	-16,200
Grid Technical Assistance.....	---	29,500	---	---	-29,500
Wholesale Electricity Market Technical Assistance and Grants.....	---	19,000	---	---	-19,000
Interregional and Offshore Transmission Planning.....	---	20,000	---	---	-20,000
Program Direction.....	---	5,521	---	---	-5,521
Acquiring and Condemning Property.....	---	150,000	---	---	-150,000
TOTAL, GRID DEPLOYMENT OFFICE.....	---	240,221	---	---	-240,221
NUCLEAR ENERGY					
Integrated University Program.....	6,000	---	---	-6,000	---
Nuclear Energy Enabling Technologies:					
Crosscutting Technology Development.....	29,000	35,250	32,000	+3,000	-3,250
Joint Modeling and Simulation Program.....	30,000	28,327	28,500	-1,500	+173
Nuclear Science User Facilities.....	33,000	39,160	35,000	+2,000	-4,160
Transformational Challenge Reactor.....	25,000	---	---	-25,000	---
Subtotal, Nuclear Energy Enabling Technologies..	117,000	102,737	95,500	-21,500	-7,237

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request

Fuel Cycle Research and Development:					
Front End Fuel Cycle:					
Mining, Conversion, and Transportation.....	2,000	1,500	2,000	---	+500
Advanced Nuclear Fuel Availability.....	45,000	95,000	---	-45,000	-95,000
Subtotal, Front End Fuel Cycle.....	47,000	96,500	2,000	-45,000	-94,500
Material Recovery and Waste Form Development.....	30,000	38,000	45,000	+15,000	+7,000
Advanced Fuels:					
Accident Tolerant Fuels.....	115,000	113,900	114,000	-1,000	+100
Triso Fuel and Graphite Qualification.....	37,000	27,000	32,000	-5,000	+5,000
Subtotal, Advanced Fuels.....	152,000	140,900	146,000	-6,000	+5,100
Fuel Cycle Laboratory R&D.....	23,150	46,500	29,000	+5,850	-17,500
Used Nuclear Fuel Disposition R&D.....	50,000	46,875	47,000	-3,000	+125
Integrated Waste Management System.....	18,000	53,000	53,000	+35,000	---
Subtotal, Fuel Cycle Research and Development...	320,150	421,775	322,000	+1,850	-99,775

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request

Reactor Concepts RD&D:					
Advanced Small Modular Reactor RD&D.....	150,000	40,000	165,000	+15,000	+125,000
Light Water Reactor Sustainability.....	48,000	45,000	45,000	-3,000	---
Advanced Reactor Technologies.....	59,000	50,000	49,000	-10,000	-1,000
Subtotal, Reactor Concepts RD&D.....	257,000	135,000	259,000	+2,000	+124,000

Versatile Test Reactor Project:					
Other Project Costs.....	---	45,000	---	---	-45,000
Subtotal, Versatile Test Reactor Project.....	---	45,000	---	---	-45,000

Advanced Reactors Demonstration Program:					
National Reactor Innovation Center.....	55,000	75,000	50,000	-5,000	-25,000
23-E-200 Laboratory for Operations and Testing in the United States.....	---	---	20,000	+20,000	+20,000
Demonstration 1.....	30,000	---	---	-30,000	---
Demonstration 2.....	30,000	---	---	-30,000	---
Risk Reduction for Future Demonstrations.....	115,000	140,238	---	-115,000	-140,238
Regulatory Development.....	15,000	10,250	10,250	-4,750	---
Advanced Reactors Safeguards.....	5,000	4,750	4,750	-250	---
Subtotal, Advanced Reactors Demonstration Program.....	250,000	230,238	85,000	-165,000	-145,238

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
Infrastructure:					
ORNL Nuclear Facilities O&M.....	20,000	---	20,000	---	+20,000
INL Facilities Operations and Maintenance.....	295,000	326,924	318,924	+23,924	-8,000
Research Reactor Infrastructure	15,000	---	---	-15,000	---
Construction:					
16-E-200 Sample Preparation Laboratory, INL.....	41,850	7,300	7,300	-34,550	---
Subtotal, Infrastructure.....	371,850	334,224	346,224	-25,626	+12,000
Idaho Sitewide Safeguards and Security.....	149,800	156,600	150,000	+200	-6,600
International Nuclear Energy Cooperation.....	3,000	3,000	---	-3,000	-3,000
Program Direction.....	80,000	85,457	85,000	+5,000	-457
NEUP, SBIR/STTR, and TCF.....	100,000	---	130,276	+30,276	+130,276
Directed R&D and University Programs.....	---	161,029	---	---	-161,029
TOTAL, NUCLEAR ENERGY.....	1,654,800	1,675,060	1,473,000	-181,800	-202,060

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
FOSSIL ENERGY AND CARBON MANAGEMENT					
Carbon Management Technologies:					
Carbon Capture.....	99,000	162,905	135,000	+36,000	-27,905
Carbon Dioxide Removal.....	49,000	65,000	70,000	+21,000	+5,000
Carbon Utilization.....	29,000	50,000	50,000	+21,000	---
Carbon Transport and Storage.....	97,000	122,000	110,000	+13,000	-12,000
Advanced Energy and Hydrogen Systems.....	94,000	---	---	-94,000	---
Hydrogen with Carbon Management.....	---	74,000	95,000	+95,000	+21,000
Policy and Analysis.....	---	4,000	---	---	-4,000
Justice and Engagement.....	---	1,000	---	---	-1,000
Crosscutting Research.....	33,000	---	---	-33,000	---
STEP (Supercritical CO2).....	15,000	---	---	-15,000	---
Subtotal, Carbon Management Technologies.....	416,000	478,905	460,000	+44,000	-18,905
Resource Technologies and Sustainability.....	110,000	---	---	-110,000	---
Advanced Remediation Technologies.....	---	12,964	55,000	+55,000	+42,036
Methane Mitigation Technologies.....	---	100,000	60,000	+60,000	-40,000
Natural Gas Decarbonization and Hydrogen Technologies.....	---	26,000	26,000	+26,000	---
Mineral Sustainability.....	53,000	44,000	54,000	+1,000	+10,000
Subtotal, Resource Technologies and Sustainability	163,000	182,964	195,000	+32,000	+12,036

(Amounts in thousands)

	FY 2022 Enacted	FY 2023 Request	Final Bill	Final Bill vs Enacted	Final Bill vs Request
Energy Asset Transformation.....	---	6,000	6,000	+6,000	---
Program Direction.....	66,800	70,291	70,000	+3,200	-291
Special Recruitment Programs.....	1,001	1,000	1,000	-1	---
University Training and Research.....	---	13,000	13,000	+13,000	---
NETL Research and Operations.....	83,000	83,000	87,000	+4,000	+4,000
NETL Infrastructure.....	75,000	55,000	55,000	-20,000	---
NETL Interagency Working Group.....	---	3,000	3,000	+3,000	---
Congressionally Directed Spending.....	20,199	---	---	-20,199	---
TOTAL, FOSSIL ENERGY AND CARBON MANAGEMENT	825,000	893,160	890,000	+65,000	-3,160
ENERGY PROJECTS	---	---	221,969	+221,969	+221,969
NAVAL PETROLEUM AND OIL SHALE RESERVES.....	13,650	13,004	13,004	-646	---
STRATEGIC PETROLEUM RESERVE					
Strategic Petroleum Reserve	219,000	214,175	207,175	-11,825	-7,000

1844

1

TITLE III

2

DEPARTMENT OF ENERGY

3

ENERGY PROGRAMS

4

NUCLEAR ENERGY

5

For an additional amount for “Nuclear Energy”,

6

\$300,000,000, to remain available until expended: *Pro-*

7

vided, That of the amount provided under this heading

8

in this Act, \$100,000,000 shall be for Advanced Nuclear

9

Fuel Availability: *Provided further*, That of the amount

10

provided under this heading in this Act, \$60,000,000 shall

11

be to carry out the demonstrations of the Advanced Reac-

12

tor Demonstration Program: *Provided further*, That of the

13

amount provided under this heading in this Act,

14

\$20,000,000 shall be to carry about activities for the Na-

15

tional Reactor Innovation Center: *Provided further*, That

16

of the amount provided under this heading in this Act,

17

\$120,000,000 shall be to carry about activities for the

18

Risk Reduction for Future Demonstrations.

19

ATOMIC ENERGY DEFENSE ACTIVITIES

20

NATIONAL NUCLEAR SECURITY

21

ADMINISTRATION

22

DEFENSE NUCLEAR NONPROLIFERATION

23

For an additional amount for “Defense Nuclear Non-

24

proliferation”, \$126,300,000, to remain available until ex-