



**FULL COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY  
HEARING CHARTER**

*“An Update on the Department of Energy’s Science and Technology Priorities”*

**Thursday, September 14, 2023  
10:00 a.m.  
2318 Rayburn House Office Building**

**Purpose**

The purpose of this hearing is to examine the U.S. Department of Energy (DOE)’s goals and priorities for its civilian research, development, demonstration, and commercial application programs. This hearing will also explore DOE’s role in meeting national challenges, such as strengthening U.S. competitiveness in emerging technologies and making American energy cleaner, more reliable, and more affordable through innovation.

**Witnesses**

- **The Honorable Jennifer Granholm**, Secretary of Energy, U.S. Department of Energy

**Overarching Questions**

- What specific role does or should DOE play in addressing national research challenges? How does DOE partner with industry, academia, and other federal agencies to accelerate the advancement of clean energy pathways and other key emerging technologies?
- What research infrastructure investments are necessary for DOE to maintain its global competitiveness? Of these - what facilities or investments should be prioritized?
- What is the overall status of DOE’s implementation of the Infrastructure Investment and Jobs Act (IIJA), the Inflation Reduction Act (IRA), and the CHIPS and Science Act?
- With the rapid expansion of DOE programs through IIJA and IRA appropriations in the coming fiscal years, how is DOE ensuring adequate oversight and coordination of these new and existing programs?
- What protections does DOE have in place to prevent federal research dollars from benefiting U.S. competitors?

## **BACKGROUND**

### Overview of the U.S. Department of Energy and Science Committee Jurisdiction

The mission of the U.S. Department of Energy (DOE) is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.<sup>1</sup> In service of its mission, DOE employs over 14,000 federal employees, oversees 95,000 contractors, and operates 17 world-leading national laboratories which steward cutting-edge research across the scientific disciplines. DOE is a leader in energy technology innovation and the largest federal sponsor of basic research in the physical sciences, and it plays a central role in the U.S. research ecosystem.

The House Committee on Science, Space, and Technology has jurisdiction over DOE's civilian research, development, demonstration, and commercial application programs. In total, the Committee oversees and authorizes over \$15 billion in DOE activities, approximately one third of the Department's annual budget. DOE activities and programs under the Committee's jurisdiction include but are not limited to: DOE's national laboratory system; fundamental science research; grid modernization and cybersecurity activities; fossil, nuclear, renewable, and other advanced energy technologies; waste and environmental management research; international research projects; alternative fuels; critical minerals research; industrial process improvements; pipeline research, development, and demonstration projects; and relevant oversight.

The Honorable Jennifer Granholm has served as the Department's 16<sup>th</sup> Secretary of Energy since February 25, 2021. Secretary Granholm previously testified before the Science Committee on May 27, 2021.<sup>2</sup>

### The DOE Office of Science

Accounting for approximately half of the Science Committee's DOE jurisdiction, the Department's Office of Science (SC) is the lead federal supporter of scientific research for energy applications and the nation's largest supporter of research in the physical sciences. The SC portfolio has two key focuses: direct support of scientific research and support of the development, construction, and operation of unique user facilities. SC carries out these missions through six distinct program offices: Advanced Scientific Computing Research (ASCR), Basic Energy Sciences (BES), Biological and Environmental Research (BER), Fusion Energy Sciences (FES), High Energy Physics (HEP), and Nuclear Physics (NP). It also supports education programs through its Workforce Development for Teachers and Scientists office and science laboratories infrastructure projects for research facilities. In carrying out these activities, the Office of Science stewards 10 of the 17 DOE laboratories.

The President's FY 2024 Budget Request includes \$8.8 billion for the Office of Science, an increase of 9% from enacted levels. Within this total, support for SC program growth varies: the request includes larger increases for FES (32%), and isotope R&D and production (58%) and flat funding for NP (1%) and BER (3%).<sup>3</sup> The House Energy and Water Appropriations bill includes \$8.1 billion

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<sup>1</sup> "Mission." *Energy.Gov*, 3 Aug. 2011, [www.energy.gov/mission](http://www.energy.gov/mission).

<sup>2</sup> House of Representatives, Congress. Serial No. 117-18 (House Hearing) - Overview of the Science and Energy Research Enterprise of the U.S. Department of Energy., <https://www.govinfo.gov/app/details/CHRG-117hhr44539/CHRG-117hhr44539>

<sup>3</sup> Department of Energy. "FY 2024 Budget in Brief." 13 March 2023, <https://www.energy.gov/sites/default/files/2023-06/doe-fy2024-budget-in-brief-v5.pdf>

for the Office of Science while the Senate Energy and Water Appropriations bill includes \$8.4 billion for this office.

### **Advanced Scientific Computing Research (ASCR)**

ASCR’s mission is “to discover, develop, and deploy computational and networking capabilities to analyze, model, and simulate complex phenomena important to the Department of Energy.”<sup>4</sup> Home to the Exascale Computing Project (ECP), ASCR conducts the federal government’s most cutting-edge computational and networking research and manages the nations’ most advanced computing systems, including Frontier at Oak Ridge National Laboratory and Aurora at Argonne National Laboratory.

### **Basic Energy Sciences (BES)**

BES “supports fundamental research to understand, predict, and ultimately control matter and energy at the electronic, atomic and molecular levels in order to provide the foundations for new energy technologies and to support DOE missions in energy, environment, and national security.”<sup>5</sup> BES carries out a broad range of fundamental research in areas from material science to geosciences and chemistry. Each year, thousands of scientists and engineers visit BES’ unique user facilities, like the Nanoscale Science Research Centers, the synchrotron radiation light sources, and neutron-scattering tools.

### **Biological and Environmental Research (BER)**

BER program activities focus on improving our understanding of multi-scale biological, biochemical, and physical processes that occur, from large-scale earth systems to molecular characterization.<sup>6</sup> BER works closely with ASCR to develop and improve earth system models. BER stewards unique scientific user facilities like the Environmental Molecular Sciences Laboratory (EMSL) located at Pacific Northwest National Laboratory, the Atmospheric Radiation Measurement (ARM) facility, and the Joint Genome Institute (JGI).

### **Fusion Energy Sciences (FES)**

The goal of FES is to expand our knowledge of matter at high densities and temperatures and expedite our ability to harness fusion power.<sup>7</sup> FES maintains three main fusion facilities: the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory, the National Spherical Torus Experiment – Upgrade (NSTX-U) at Princeton Plasma Physics Laboratory (PPPL), and DIII-D at General Atomics. FES manages U.S. participation in the International Thermonuclear Experimental Reactor (ITER) project, which is the leading international effort to advance fusion research. In addition, FES supports the advancement of the burgeoning U.S. fusion industry through initiatives like the Milestone Based Fusion Development Program and Gateway for Accelerated Innovation in Nuclear (GAIN).<sup>8</sup>

### **High Energy Physics (HEP)**

HEP researchers aim to advance our ability to answer fundamental questions relating to the universe, the interactions between energy and matter, and the nature of space and time. HEP supports theoretical and experimental research in fundamental accelerator science and technology and particle

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<sup>4</sup> “ASCR About.” *U.S. Department of Energy*, 15 Jan. 2021, [science.osti.gov/ascr/About](https://science.osti.gov/ascr/About).

<sup>5</sup> “Basic Energy Sciences (BES).” *U.S. Department of Energy*, 1 Mar. 2023, [science.osti.gov/bes](https://science.osti.gov/bes).

<sup>6</sup> “Biological and Environmental Research (BER).” *U.S. Department of Energy*, 1 Mar. 2023, [science.osti.gov/ber](https://science.osti.gov/ber).

<sup>7</sup> “Fusion Energy Sciences (FES).” *U.S. Department of Energy*, 11 July 2023, [science.osti.gov/fes](https://science.osti.gov/fes).

<sup>8</sup> “Fusion Energy Sciences (FES).” *U.S. Department of Energy*, 11 July 2023, [science.osti.gov/fes](https://science.osti.gov/fes).

physics.<sup>9</sup> HEP has two main user facilities: the Fermilab Accelerator Complex and the Facility for Advanced Accelerator Experimental Tests II (FACET-II). These particle accelerators provide researchers and scientists with the ability to conduct groundbreaking experiments at high energy frequencies. Through HEP funding, Fermilab is in the process of building the Long Baseline Neutrino Facility/Deep Underground Neutrino Experiment (LBNF/DUNE) and the Proton Improvement Plan II (PIP-II), which expands our capabilities in neutrino science. HEP collaborates with international partners such as the European Organization for Nuclear Research, known as CERN, who maintain the Large Hadron Collider (LHC), which was responsible for the discovery of the Higgs Boson.<sup>10</sup>

### **Nuclear Physics (NP)**

NP seeks to expand our knowledge of all forms of nuclear matter; NP's research is fundamental to answering larger questions such as our understanding of the universe and its inner workings.<sup>11</sup> The program supports theoretical and experimental research using particle accelerators and advanced technologies. Researchers and scientists conduct fundamental basic research into nuclear physics at world leading facilities such as the Facility for Rare Isotope Beams (FRIB), the Relativistic Heavy Ion Collider (RHIC), the Continuous Electron Beam Accelerator Facility (CEBAF), and the Argonne Tandem Linear Accelerator System (ATLAS), and the LHC. DOE's Brookhaven National Laboratory is in the process of constructing the Electron-Ion Collider (EIC), which will allow scientists to x-ray a proton and further our understanding of the interactions between quarks and gluons.

### DOE's Applied Energy Offices

Within the Committee's jurisdiction, DOE also supports a wide range of energy R&D activities through applied energy offices like its Office of Energy Efficiency and Renewable Energy (EERE), Office of Nuclear Energy (NE), Office of Fossil Energy and Carbon Management (FECM), Office of Electricity (OE), Office of Cybersecurity Energy Security and Emergency Response (CESER), and Office of Clean Energy Demonstrations (OCED). In FY 2023, NE was funded at \$1.8 billion, EERE at \$3.5 billion, FECM at \$890 million, OE at \$350 million, CESER at \$200 million, and OCED at \$ 89 million.<sup>12</sup> The President's FY24 Budget Request includes cuts for NE (-12%) and OE (-15%), increases for CESER (23%), EERE (11%), and FECM (2%) and substantial growth for OCED (142%). House Energy and Water provided funding amounts for each of these offices with NE (\$1.78 billion), EERE (\$2.99 billion), FECM (\$858 million), OE (\$316 million), CESER (\$200 million) and OCED (\$35 million). Senate Energy and Water provides funding amounts for each of these offices with NE (\$1.55 billion), EERE (\$3.69 billion), FECM (\$892 million), OE (\$290 million), CESER (\$200 million) and OCED (\$89 million).

The Science Committee also has jurisdiction over DOE's Advanced Research Projects Agency – Energy (ARPA-E) (funded at \$470 million in FY23, FY24 request includes a 38% increase for this office, House Energy and Water includes \$470 million for this office, Senate Energy and Water includes \$450 million for this office), its Office of Technology Transitions (OTT) (funded at \$22

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<sup>9</sup> "High Energy Physics (HEP)." *U.S. Department of Energy*, 1 Mar. 2023, [science.osti.gov/hep](https://science.osti.gov/hep).

<sup>10</sup> "July 4, 2012: Discovery of a Particle 'Consistent' with Higgs Boson." *U.S. Department of Energy*, 4 July 2012, [www.energy.gov/management/july-4-2012-discovery-particle-consistent-higgs-boson](https://www.energy.gov/management/july-4-2012-discovery-particle-consistent-higgs-boson).

<sup>11</sup> "Nuclear Physics (NP)." *U.S. Department of Energy*, 1 Mar. 2023, [science.osti.gov/np](https://science.osti.gov/np).

<sup>12</sup> Department of Energy. Fiscal Year 2024 Budget Request: Science. Volume 5, March 13, 2023. <https://www.energy.gov/sites/default/files/2023-03/doe-fy-2024-budget-vol-5-science-v3.pdf>

million in FY23, FY24 request includes a 156% increase for this office, House Energy and Water includes \$22.1 million for this office, Senate Energy and Water includes \$20 million for this office), and its Title 17 Loan program (funded at \$66.2 million in FY23, FY24 request includes a 6% increase for this office, House Energy and Water includes \$70 million for this office, Senate Energy and Water includes \$70 million for this office).

### **Energy Efficiency & Renewable Energy (EERE)**

EERE prioritizes research, development, demonstration, and deployment of technologies which greatly reduce carbon emissions and decarbonize the economy.<sup>13</sup> Specifically, EERE supports the advancement of R&D in biofuels, hydrogen, fuel cell technology, solar, wind, water, geothermal, building technologies, and advanced manufacturing. Its national laboratory, the National Renewable Energy Laboratory (NREL), conducts this research in partnership with industry and other national laboratories. NREL serves as a testbed for researchers and develops best practices and standards for new technologies.

### **Fossil Energy and Carbon Management (FECM)**

FECM seeks to reduce the carbon emissions of fossil fuels and their environmental impact.<sup>14</sup> FECM supports research, development, and demonstration projects in point source carbon capture, hydrogen with carbon management, carbon transportation and storage, carbon dioxide removal, methane mitigation, and critical minerals. FECM's National Energy Technology Laboratory (NETL), located in Morgantown, WV, Pittsburgh, PA, and Albany, OR, leads the world in cutting-edge applied fossil research. It has been widely successful in advancing research and technology, which led to the Shale Revolution.

### **Electricity (OE)**

OE supports the reliability and resiliency of our national energy infrastructure through the research and development of new technologies.<sup>15</sup> The office focuses on three divisions: grid systems and components, grid controls and communications, and energy storage. Specifically, OE administers programs relating to transmission reliability, grid modeling, transformer resilience, and energy storage. These programs prioritize investments in both the software and hardware components of our electricity system. OE partners with both industry and the national laboratories to accelerate this modernization as well.

### **Nuclear Energy (NE)**

NE supports DOE's mission in nuclear science and technology.<sup>16</sup> Its goal is to support the existing U.S. nuclear fleet as well as develop next generation nuclear reactors and fuels. NE leads and assists with several DOE initiatives including the Advanced Reactor Demonstration Program, Nuclear Energy University Program, High-Assay Low-Enriched Uranium (HALEU) Availability Program, Space Power Systems, and Fuel Cycle Technologies. These programs are critical to accelerating the deployment of new reactors and developing the next generation workforce. Idaho National Laboratory (INL) is the sole national laboratory within NE; INL serves as a testbed for researchers and companies who take advantage of its leading facilities such as the Advanced Test Reactor (ATR).

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<sup>13</sup> "About the Office of Energy Efficiency and Renewable Energy." *Energy.Gov*, 8 June 2011, [www.energy.gov/eere/about-office-energy-efficiency-and-renewable-energy](http://www.energy.gov/eere/about-office-energy-efficiency-and-renewable-energy).

<sup>14</sup> "About Us Office of Fossil Energy and Carbon Management." *Energy.Gov*, 29 May 2020, [www.energy.gov/fecm/about-us](http://www.energy.gov/fecm/about-us).

<sup>15</sup> "About the Office of Electricity." *Energy.Gov*, 4 Aug. 2011, [www.energy.gov/oe/about-office-electricity](http://www.energy.gov/oe/about-office-electricity).

<sup>16</sup> "About Us Office of Nuclear Energy." *Energy.Gov*, 6 Mar. 2014, [www.energy.gov/ne/about-us](http://www.energy.gov/ne/about-us).

## **Cybersecurity, Energy Security, and Emergency Response (CESER)**

CESER is tasked with advancing DOE mission priorities related to the research and development of tools to protect U.S. critical energy infrastructure from both cyber and physical threats. CESER partners extensively with industry stakeholders like the Electricity Subsector Coordinating Council (ESCC), the Electricity Information Sharing and Analysis Center (E-ISAC), the Oil and Natural Gas Subsector Coordinating Council, and other federal agencies like the Department of Defense, and the National Institute for Standards and Technology. Its activities include R&D into advanced cybersecurity solutions, acceleration of information sharing to enhance situational awareness, and technical assistance in the development and adoption of best practices.<sup>17</sup>

## **Loan Program Office (LPO)**

LPO provides financing to large scale energy infrastructure projects within the United States.<sup>18</sup> It was created in 2005 to assist new technologies to cross “the valley of death,” where private capital is reluctant to fund. Its main program, Title 17 Clean Energy Financing, supports energy projects over a variety of areas such as CCUS, hydrogen fuel cell, renewables, and energy storage projects. The Inflation Reduction Act increased this office’s loan authority from \$40 billion to \$400 billion.

## **Advanced Research Projects Agency – Energy (ARPA-E)**

Established in 2007, ARPA-E invests in high-risk, high-reward technologies, which the private sector is reluctant to fund.<sup>19</sup> These technologies include fusion energy, batteries, energy storage, enhanced geothermal systems, etc. ARPA-E is modeled after the Defense Advanced Research Projects Agency (DARPA), which employs public-private partnerships to accelerate transformational research projects. By investing over \$3.58 billion in more than 1,500 projects, ARPE-E projects have formed 149 companies, attracted over \$10 billion in outside investment, and issued over 1,000 patents.<sup>20</sup>

## Key Legislation

### **The Infrastructure Investment and Jobs Act (IIJA) and the Inflation Reduction Act (IRA)**

Outside of the annual appropriations process, the IIJA and the IRA have provided DOE with a total of \$45 billion in additional appropriations for program funding, infrastructure investments, and loan guarantees, as well as DOE’s expanded loan authority within the Science Committee’s jurisdiction. This is approximately three times DOE’s annual appropriations level for Science Committee activities.

The IIJA, which was enacted on November 15, 2021, appropriated more than \$62 billion to the Department of Energy in the coming fiscal years and created 60 new programs, including the Office of Clean Energy Demonstrations (OCED). Approximately \$39 billion of these appropriated funds fall under the Science Committee’s jurisdiction along with a corresponding \$39 billion in program authorizations. The IIJA provides the Department with substantial appropriations for applied energy R&D activities, including, but not limited to, clean hydrogen initiatives, carbon capture utilization, and storage (CCUS) R&D, grid security and resiliency programs, and battery R&D. In addition, the

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<sup>17</sup> “Cybersecurity.” *Energy.Gov*, 16 Dec. 2016, [www.energy.gov/ceser/cybersecurity](http://www.energy.gov/ceser/cybersecurity).

<sup>18</sup> “About Us Loan Programs Office.” *Energy.Gov*, 20 June 2015, [www.energy.gov/lpo/about-us](http://www.energy.gov/lpo/about-us).

<sup>19</sup> “About .” *Arpa-e*, 21 Feb. 2013, [arpa-e.energy.gov/about](http://arpa-e.energy.gov/about).

<sup>20</sup> “Our Impact.” *Arpa-e*, July 2023, [arpa-e.energy.gov/about/our-impact](http://arpa-e.energy.gov/about/our-impact).

IJA authorized appropriations for various programs first authorized in the Energy Act of 2020, including the Advanced Reactor Demonstration Program and the Energy Storage Demonstration and Pilot Grant Program.<sup>21</sup>

Since its passage almost two years ago, DOE has awarded billions to companies, consortiums, non-profits, and universities through programs such as the Civil Nuclear Credit Program, Clean Energy Demonstration Program on current and former mine land, Carbon Storage Validation and Testing program, the Electric Drive Vehicle Battery Recycling and Second Life Applications Program, and the Battery Material Processing and Battery Manufacturing and Recycling Grants. Recently, the Department announced that it selected two commercial-scale direct air capture facilities to receive up to \$1.2 billion for its Regional Direct Air Capture Hubs Program.<sup>22</sup> DOE has yet to award funding for the \$8 billion Regional Clean Hydrogen Hubs. DOE received final applications in the Spring and will announce its selections this Fall.

The IRA, which was enacted on August 16, 2022, appropriated \$35 billion to the Department of Energy in the coming fiscal years. Approximately \$6.3 billion of these funds fall under the Science Committee's jurisdiction. The IRA created 15 new DOE programs and provided funding for five existing DOE programs such as the Office of Nuclear Energy's High-Assay Low-Enriched Uranium (HALEU) Availability Program and the Title 17 Loan Program Office.<sup>23</sup>

Despite the IRA's primary focus on DOE's applied R&D programs, it also includes \$1.5 billion for science laboratory infrastructure improvements at the DOE National Laboratories. As of last year, these funds have already been distributed to 52 projects and facilities.<sup>24</sup> The remaining funds within the House Science Committee's jurisdiction has yet to be distributed for the Availability of HALEU. In June, DOE solicited feedback for two draft requests for proposals, which would acquire HALEU through enrichment and deconversion services; DOE has yet to release funding opportunity announcements for these activities.<sup>25</sup>

### **The CHIPS and Science Act of 2022**

The CHIPS and Science Act, which was enacted on August 9, 2022, authorized over \$67 billion for DOE research and development programs within the Science Committee's jurisdiction, including \$49.8 billion for SC.<sup>26</sup> Specifically, in Title I of Division B, this law provides the first ever comprehensive authorization of SC, prioritizing fundamental research in basic energy sciences, biological and environmental sciences, advanced scientific computing, fusion energy sciences, high energy physics, isotopes, and nuclear physics. It also includes appropriate funding profiles for large

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<sup>21</sup> "H.R.3684 - 117th Congress (2021-2022): Infrastructure Investment and Jobs Act." *Congress.gov*, Library of Congress, 15 November 2021, <https://www.congress.gov/bill/117th-congress/house-bill/3684>.

<sup>22</sup> "Biden-Harris Administration Announces up to \$1.2 Billion for Nation's First Direct Air Capture Demonstrations in Texas and Louisiana." *Energy.Gov*, 11 Aug. 2023, [www.energy.gov/articles/biden-harris-administration-announces-12-billion-nations-first-direct-air-capture](http://www.energy.gov/articles/biden-harris-administration-announces-12-billion-nations-first-direct-air-capture).

<sup>23</sup> "H.R.5376 - 117th Congress (2021-2022): Inflation Reduction Act of 2022." *Congress.gov*, Library of Congress, 16 August 2022, <https://www.congress.gov/bill/117th-congress/house-bill/5376>.

<sup>24</sup> Thomas, Will. "DOE Projects Putting Inflation Reduction Act Funds to Work." *American Institute of Physics*, American Institute of Physics, 1 Dec. 2022, <https://www.aip.org/fyi/2022/doe-projects-putting-inflation-reduction-act-funds-work>.

<sup>25</sup> "U.S. Department of Energy to Acquire High-Assay Low-Enriched Uranium Material." *Energy.Gov*, 5 June 2023, [www.energy.gov/ne/articles/us-department-energy-acquire-high-assay-low-enriched-uranium-material](http://www.energy.gov/ne/articles/us-department-energy-acquire-high-assay-low-enriched-uranium-material).

<sup>26</sup> "H.R.4346 - 117th Congress (2021-2022): Chips and Science Act." *Congress.gov*, Library of Congress, 9 August 2022, <https://www.congress.gov/bill/117th-congress/house-bill/4346>.

scale research experiments such as the Deep Underground Neutrino Experiment (DUNE) at the Long Baseline Neutrino Facility (LBNF) and ITER as well as the construction of and upgrades to essential SC user facilities and projects.

It is important to note that despite this authorization, the CHIPS and Science Act does not include appropriations for this office. In addition, while SC accounts for nearly 20 percent of DOE's annual funding profile, it received less than 2 percent of DOE's total IIJA and IRA appropriations.

DOE's implementation of the CHIPS and Science Act can be measured by the President's FY24 budget request. This request includes valuable updates, including funding for several construction projects and facility upgrades consistent with the levels authorized in the CHIPS and Science Act – such as LBNF/DUNE.<sup>27</sup> The request also has funding for Microelectronics Science Research Centers consistent with the Micro Act provisions in CHIPS and Science.<sup>28</sup> Many questions about DOE's commitment to implementing this law remain unanswered. For instance, the President's FY24 budget request does not provide CHIPS and Science-level support for the SC topline or for core research funding across major Office of Science programs in areas like materials science, particle physics, nuclear physics, and plasma science. The request also proposes a reduction in funding for quantum information science and technology – a decision that could directly prevent the full implementation of key CHIPS and Science provisions like the Quantum Network Infrastructure Program and the Quantum User Expansion for Science and Technology (QUEST) Program.<sup>29</sup>

The Committee is also particularly interested in receiving a status update on several CHIPS and Science-mandated reports whose submission deadlines have now passed. These reports, like the Quantum Network Infrastructure Research and Development Program Report, Engineered Ecosystems Initiative Report, Energy Efficient Computing Program Report, Broadening Participation for Teachers and Scientists Report, Expanding Opportunities for Highly Skilled Science, Technology, Engineering, and Mathematics (STEM) Professionals Report, and Advanced Computing Program Report, were designed to inform this Committee on the progress the Department is making on these high-priority activities.<sup>30</sup>

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<sup>27</sup> Department of Energy. Fiscal Year 2024 Budget Request: Science. Volume 5, March 13, 2023.

<sup>28</sup> *Id.*

<sup>29</sup> Department of Energy. Fiscal Year 2024 Budget Request: Science. Volume 5, March 13, 2023.

<https://www.energy.gov/sites/default/files/2023-03/doe-fy-2024-budget-vol-5-science-v3.pdf>

<sup>30</sup> "H.R.4346 - 117th Congress (2021-2022): Chips and Science Act." Congress.gov, Library of Congress, 9 August 2022, <https://www.congress.gov/bill/117th-congress/house-bill/4346>.