March 14, 2022

The Energy Sciences Coalition (ESC) thanks Congress for continuing its strong, bipartisan support of the U.S. Department of Energy (DOE) Office of Science in the fiscal year (FY) 2023 omnibus appropriations bill (H.R. 2617). To build on this support, ESC urges Congress to appropriate $9.5 billion in FY 2024 for DOE Office of Science, as authorized under section 10112 of the CHIPS and Science Act (Public Law 117-167). This level of funding is necessary to maintain U.S. competitiveness. Specifically, increased funding is needed to accelerate construction of world-class scientific facilities, support groundbreaking scientific discoveries, advance energy technologies needed for the nation to meet net-zero carbon emissions, develop emerging technologies, and grow a highly skilled and diverse science and technology workforce that is essential for the United States to compete globally.

As the nation’s primary sponsor of physical sciences research, the DOE Office of Science plays a vital role in the American scientific ecosystem—a proven model for success in discovery and innovation. The Office of Science sponsors research programs vital to American prosperity and security at research universities and national laboratories and helps maintain the U.S. pipeline of science and engineering talent. The Office of Science is also unique among federal science agencies, supporting the network of 17 DOE national laboratories—a competitive advantage for the nation’s research and innovation ecosystem—and directly stewarding ten of them. The Office of Science also builds and operates 28 of the most sophisticated, world-class scientific user facilities used by universities, industry and other federal agencies.

Bold new investments in fundamental research are needed to stay ahead of international competition, maintain U.S. competitiveness, and create American jobs of the future in key energy sectors as well as new technology areas such as high-performance computing, artificial intelligence, biotechnology, microelectronics, and quantum information science. In particular, scientific breakthroughs and energy technology innovation are still necessary to decarbonize the U.S. economy and mitigate the worst effects of climate change. Office of Science-supported fundamental research forms the foundation for future energy technologies. The current imperative—energy systems that meet our energy security, economic, and environmental challenges—requires increasing investments in all areas of fundamental research to advance all energy systems, including energy storage, negative emission technologies, advanced nuclear, hydrogen, fusion, renewables such as wind and solar, carbon capture, storage and utilization, and next-generation fuels. The Office of Science is also a leader in advancing emerging technologies and combining more than one to solve the nation’s most pressing challenges.

ESC’s $9.5 billion funding recommendation is needed to:

- grow core research at national laboratories and research universities across all six major Office of Science program areas. This includes investments in the physical sciences, biological sciences,

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ESC also supports funding for the cross-cutting research initiatives and programs within DOE outlined in the CHIPS and Science Act, including:

- **No less than $431 million for Quantum Information Science:** The U.S. remains a world leader in quantum information science but additional resources are needed to expand and launch new programs and support use-inspired research projects that focus on initial applications, especially in sensing and metrology, communications, and computing and simulation, focused on solving grand challenge problems. This funding recommendation includes:
  - $175 million for foundational and use-inspired research and $125 million for the five DOE national quantum centers, consistent with enacted funding levels;
  - $100 million for the quantum networking program authorized in the CHIPS and Science Act to launch and expand quantum internet, networking, and communications testbeds and research efforts consistent with DOE’s “America’s Blueprint for the Quantum Internet” strategy; and
  - $31.5 million for the quantum user expansion for science and technology (QUEST) program as authorized in the CHIPS and Science Act to expand access to researchers to the nation’s leading quantum infrastructure and capabilities. (Section 10104)

- **No less than $200 million for Microelectronics Research and Development:** DOE Office of Science plays a unique role in developing next-generation semiconductors and microelectronics and its efforts would be complementary to other federal agencies, such as the National Science Foundation and the Departments of Defense and Commerce. This funding recommendation includes $100 million for broad-based foundational research and development activities and $100 million to fund up to four Microelectronics Research Science Centers as authorized in the CHIPS and Science Act. (Section 10731)

- **No less than $150 million for a Midscale Instrumentation and Research Equipment Program:** This program would advance the development and deployment of world-class research instrumentation and equipment for user facilities, provide a greater range of platform...
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Technologies for researchers in academia, national labs and industry, and help train the next generation of engineers. (Section 10112)

- **No less than $100 million for the High Intensity Laser Research Initiative:** This initiative would advance research and development of petawatt-scale and of high average power laser technologies to reclaim U.S. leadership and support a user network of academic and National Laboratory high intensity laser facilities. This funding recommendation is consistent with authorization in the *CHIPS and Science Act*. (Section 10112)

To help guide these investments, ESC strongly recommends following the advice of the six DOE Office of Science federal advisory committees on research priorities and infrastructure investments. Since their inception, the Office of Science advisory committees have provided valuable, independent advice on complex scientific and technical issues and they have been essential for engaging the scientific community in open and transparent processes related to user facility planning, assessment, ranking and prioritization. They also help establish consensus across the scientific community on research priorities and goals. Recent examples include the international benchmarking study for materials and chemistry research and associated facilities needed to stay ahead of international competition and the fusion energy and plasma science long-range plan with recommended steps to delivery fusion energy on the grid. ESC recommends that the Biological and Environmental Research Advisory Committee provide recommendations on research priorities for mid-scale, multi-institutional research centers for earth and environmental systems science as authorized in the *CHIPS and Science Act*. (Section 10103)

The United States must maintain its leadership in science, technology and innovation, and the DOE Office of Science plays a pivotal and leading role in addressing this country’s energy, national security, and environmental challenges. For these reasons, we urge Congress to provide $9.5 billion for the Office of Science in FY 2024. We look forward to working with you in advancing the critical missions of this invaluable agency.

Sincerely,

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ESC Membership

American Association for the Advancement of Science
American Association of Physicists in Medicine
American Association of Physics Teachers
American Astronomical Society
American Chemical Society
American Crystallographic Association
American Geophysical Union
American Geosciences Institute
American Institute of Physics
American Mathematical Society
American Nuclear Society
American Physical Society
American Society for Engineering Education
American Society of Agronomy
Acoustical Society of America (ASA)
American Society of Mechanical Engineers
American Society for Microbiology
American Society of Plant Biologists
American Vacuum Society
Arizona State University
Association of American Universities
Association of Public and Land-grant Universities
AVS – The Society for Science and Technology of Materials, Interfaces, and Processing
Battelle
Binghamton University
Biophysical Society
Boston University
Case Western Reserve University
City College of CUNY
Clemson University
Coalition for Academic Scientific Computation (CASC)
Consortium for Ocean Leadership
Columbia University
Computing Research Association
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Cornell University
Cray Inc.
Crop Science Society of America
Duke University
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Federation of American Societies for Experimental Biology
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Miami University of Ohio
Michigan State University
Michigan Technological University
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Northwestern University
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Optica (formerly OSA)
Pace University
Penn State University
Princeton University
Purdue University
Rensselaer Polytechnic Institute
Rutgers, The State University of New Jersey
Society for Industrial and Applied Mathematics
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