ENERGY SCIENCES COALITION

Energy Sciences Coalition Statement to the
Secretary of Energy Advisory Board
On the Critical Role the Department of Energy Office of Science Plays in Responding to the Climate Challenge and Clean Energy Transition

January 18, 2022

Dear Members of the Secretary of Energy Advisory Board (SEAB):

On behalf of the more than 100 member organizations of the Energy Sciences Coalition (ESC), we thank you for your public service. As you prepare policy and funding recommendations for the Secretary of Energy related to combatting climate change and achieving net zero emissions by 2050, **ESC urges you to give the Office of Science a leading role within the Department of Energy (DOE) in advancing ambitious climate and clean energy goals**.

The DOE Office of Science is a critical part of the nation's innovation ecosystem and is the nation's largest funder of the physical sciences. Among its core mission objectives is conducting fundamental science to deliver solutions and technologies to address climate change, clean energy, and environmental sustainability. **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 continued, robust 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. We encourage you to bring the programs, capabilities, and expertise of the Office of Science to bear in all these areas, including DOE's Energy Earthshots in hydrogen, long duration energy storage, and carbon removal.

The DOE Office of Science is unique among federal science agencies, supporting the network of 17 DOE national laboratories—the crown jewels of the nation's research and innovation ecosystem— and directly stewarding ten of them. Over 300 universities and other research institutions across all 50 states are also supported by over $1 billion in Office of Science research funding annually. One of the greatest strengths of the national laboratories and their partnerships with academia and industry is science at scale, which will be required to find solutions to climate change and help deploy clean energy technologies and ensure environmental sustainability and equity.

The DOE Office of Science has a long history of combining the talent and capabilities of the national laboratories' unique science facilities, the country's research universities, and industry to bring together multi-disciplinary teams to tackle fundamental science, energy, environmental, and national security grand challenges. The most recent examples are the bioenergy research centers, national quantum

information science research centers and the nation's response to COVID-19. The DOE Office of Science already supports the country's leading scientists at national laboratories and research universities to address climate change. For example, researchers are developing predictive models of climate change as well changing interactions among climate, water, and energy to help decision makers understand impacts on ecosystems and human well-being and develop strategies to mitigate or adapt to change. Fundamental, use-inspired research in novel materials at the national labs in collaboration with industry and academia is speeding the delivery of solutions at scale and scope for carbon capture and long duration, grid-scale energy storage.

The DOE Office of Science is also the nation's steward of the most sophisticated, world-class scientific user facilities used by research universities, industry and most federal agencies to advance their scientific and technology goals and objectives. Conceived of, built and managed by Office of Science national laboratories and universities across the country these 28 large scale and world leading include particle accelerators, experimental reactors, X-ray synchrotron and free-electron laser light sources, leadership-class supercomputers and other high-precision instruments – tools that provide unprecedented access to molecular, microbial, atomic, and subatomic structures and chemistry. Annually, more than 36,000 researchers from academia, industry and federal agencies use these facilities to support their pursuits in science and engineering. Other federal agencies involved in addressing climate change rely on access to these facilities, including the National Aeronautics and Space Administration, the National Oceanic and Atmospheric Administration, the National Science Foundation, and the Environmental Protection Agency. As an example related to climate, DOE has operated the Atmospheric Radiation Measurement (ARM) user facility for over 30 years, the country's leading ground-based measurements tools, especially for clouds and aerosols, located in different geographic regions around the world. ARM data has been critical in expanding scientific understanding of atmospheric processes and improving global-scale weather and climate models.

Equally important, the Office of Science prepares the next generation of American scientific and engineering talent. To be world leaders in addressing climate change and transitioning the economy to clean energy requires additional investments in STEM workforce and education programs. Through competitively awarded grants, Office of Science supports approximately 22,000 Ph.D. scientists, engineers, graduate students, undergraduates and technical personnel at more than 300 institutions across all 50 states and the District of Columbia. DOE-funded research and education programs strengthen our nation's scientific knowledge base and prepare the next generation of scientists and engineers by providing hands-on experience for students. ESC urges you support expanding successful education programs, such as the Office of Science Graduate Fellowship Program, to support the best and brightest students from multidisciplinary areas of research in pursuing their advanced degrees. ESC also urges the creation of new workforce development programs to increase diversity, equity, and inclusion of STEM professionals working in DOE mission-relevant disciplines, and significantly broaden recruitment pools to leverage existing domestic talent.

The DOE Office of Science plays a pivotal and leading role in addressing this country's climate, energy, national security, and environmental challenges. ESC again urges you to prioritize and fully leverage DOE Office of Science capabilities and expertise to address these challenges.

Sincerely,

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APPENDIX I. 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
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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
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Coalition for Academic Scientific Computation (CASC)
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