# Draft Einstein America Act

**Section 1. Short Title.** This Act may be cited as the "Enabling Innovation for Science, Technology, and Energy in America Act of 2013."

## TITLE I—OFFICE OF SCIENCE

**Section 101. Mission**.—Section 7139 of title 42, United States Code, is amended by adding at the end the following:

"(c) The mission of the Office of Science shall be the delivery of scientific discoveries, capabilities, and major scientific tools to transform the understanding of nature and to advance the energy, economic, and national security of the United States. In support of this mission, the Director shall carry out programs on basic energy sciences, biological and environmental research, advanced scientific computing research, fusion energy sciences, high energy physics, and nuclear physics through activities focused on--

(1) Science for Discovery to unravel nature's mysteries through the study of subatomic particles, atoms, and molecules that make up the materials of our everyday world to DNA, proteins, cells, and entire biological systems;

(2) Science for National Need by--

(A) advancing a clean energy agenda through research on energy production, storage, transmission, efficiency, and use; and

(B) advancing our understanding of the Earth's climate through research in atmospheric and environmental sciences; and

(3) National Scientific User Facilities to deliver the 21st century tools of science, engineering, and technology and provide the Nation's researchers with the most advanced tools of modern science including accelerators, colliders, supercomputers, light sources and neutron sources, and facilities for studying the nanoworld.

**Section 102. Basic Energy Sciences.**

(a) Program – The Director shall carry out a program in basic energy sciences, including materials sciences and engineering, chemical sciences, physical biosciences, and geosciences, for the purpose of providing the scientific foundations for new energy technologies.

(b) Mission - The mission of the Program shall be to support 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 Department missions in energy, environment, and national security.

(c) Basic Energy Sciences User Facilities- The Director shall carry out a program for the development, construction, operation, and maintenance of national user facilities to support the program under this section. As practicable, these facilities shall serve the needs of the Department, industry, the academic community, and other relevant entities to create and examine new materials and chemical processes for the purposes of advancing new energy technologies and improving the competitiveness of the United States. These facilities shall include--

(1) x-ray light sources;
(2) neutron sources;
(3) electron beam microcharacterization centers;
(4) nanoscale science research centers; and
(5) other facilities the Director considers appropriate, consistent with section 101(c).

(d) Light Source Leadership Initiative – In support of the program authorized in subsection (c) of this section, the Director shall establish an initiative to sustain and advance global leadership of light source user facilities.

(1) Not later than 9 months after enactment of this act, and biennially thereafter, the Director shall prepare, in consultation with relevant stakeholders, and submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a light source leadership strategy that—
   (A) identifies, prioritizes, and describes plans for the development, construction, and operation of light sources over the next decade;
   (B) describes plans for optimizing management and use of existing light source facilities; and
   (C) assesses the international outlook for light source user facilities and describes plans for U.S. cooperation in such projects.
(2) Within 45 days of submission of the plan described in paragraph (1), the Basic Energy Sciences Advisory Committee shall provide the Director and the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural resources of the Senate feedback on and recommendations for improving the plan.
(3) The Director shall transmit annually to Congress a proposed budget corresponding to the activities identified in the plan.

(e) Accelerator Research and Development - The Director shall carry out research and development on advanced accelerator technologies relevant to the development of Basic Energy Sciences user facilities, in consultation with the Office of Science's High Energy Physics and Nuclear Physics programs.

**Section 103. Advanced Scientific Computing Research**.

(a) Program – The Director shall carry out a research, development, demonstration, and commercial application program to advance computational and networking capabilities to analyze, model, simulate, and predict complex phenomena relevant to the development of new energy technologies and the competitiveness of the United States.
(b) In General - The Office of Advanced Scientific Computing Research should develop and maintain world-class computing and network facilities for science and deliver critical research in applied mathematics, computer science, and advanced networking to support the Department's missions.
(c) Short title. This subsection may be cited as the `American Super Computing Leadership Act'.
(d) Definitions.

Section 2 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541) is amended by striking paragraphs (1) through (5) and inserting the following:

"`(1) CO-DESIGN- The term `co-design' means the joint development of application algorithms, models, and codes with computer technology architectures and operating systems to maximize effective use of high-end computing systems.
`(2) DEPARTMENT- The term `Department' means the Department of Energy.
`(3) EXASCALE- The term `exascale' means computing system performance at or near 10 to the 18th power floating point operations per second.
`(4) HIGH-END COMPUTING SYSTEM- The term `high-end computing system' means a computing system with performance that substantially exceeds that of systems that are commonly available for advanced scientific and engineering applications.
`(5) INSTITUTION OF HIGHER EDUCATION- The term `institution of higher education' has the meaning given the term in section 101(a) of the Higher Education Act of 1965 (20 U.S.C. 1001(a)).
`(6) NATIONAL LABORATORY- The term `National Laboratory' means any one of the seventeen laboratories owned by the Department.
`(7) SECRETARY- The term `Secretary' means the Secretary of Energy.
`(8) SOFTWARE TECHNOLOGY- The term `software technology' includes optimal algorithms, programming

environments, tools, languages, and operating systems for high-end computing systems.'.

(e) DEPARTMENT OF ENERGY HIGH-END COMPUTING RESEARCH AND DEVELOPMENT PROGRAM.

Section 3 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5542) is amended--

(1) in subsection (a)--

(A) in paragraph (1), by striking `program' and inserting `coordinated program across the Department';

(B) by striking `and' at the end of paragraph (1);

(C) by striking the period at the end of paragraph (2) and inserting `; and'; and

(D) by adding at the end the following new paragraph:

"(3) partner with universities, National Laboratories, and industry to ensure the broadest possible application of the technology developed in this program to other challenges in science, engineering, medicine, and industry.";

(2) in subsection (b)(2), by striking `vector' and all that follows through `architectures' and inserting `computer technologies that show promise of substantial reductions in power requirements and substantial gains in parallelism of multicore processors, concurrency, memory and storage, bandwidth, and reliability';

(3) by striking subsection (b)(3) and inserting the following paragraph:

"(3) In concert with architecture development efforts, conduct research in applied mathematics, computer science, and software development, including: research on operating systems, programming environments, and languages to support advanced architectures; and research on mathematical modeling and computational algorithms that enable simulation and data analysis of large-scale scientific problems and design of engineered systems on advanced architectures;"; and

(4) by striking subsection (d) and inserting the following:

`(d) Exascale Computing Program-

`(1) IN GENERAL- The Secretary shall conduct a coordinated research program to develop exascale computing systems to advance the missions of the Department.

`(2) EXECUTION- The Secretary shall, through competitive merit review, establish at least one National Laboratory-industry-university partnership to conduct integrated research, development, and engineering of multiple exascale architectures, and--

`(A) conduct mission-related co-design activities in developing such exascale platforms;

`(B) develop those advancements in hardware and software technology required to fully realize the potential of an exascale production system in addressing Department target applications and solving scientific problems involving predictive modeling and simulation and large-scale data analytics and management; and

`(C) explore the use of exascale computing technologies to advance a broad range of science and engineering.

`(3) ADMINISTRATION- In carrying out this program, the Secretary shall--

`(A) provide, on a competitive, merit-reviewed basis, access for researchers in United States industry, institutions of higher education, National Laboratories, and other Federal agencies to these exascale systems, as appropriate; and

`(B) conduct outreach programs to increase the readiness for the use of such platforms by domestic industries, including manufacturers.

`(4) REPORTS-

`(A) INTEGRATED STRATEGY AND PROGRAM MANAGEMENT PLAN- The Secretary shall submit to Congress, not later than 90 days after the date of enactment of the American Super Computing Leadership Act, a report outlining an integrated strategy and program management plan, including target dates for prototypical and production exascale platforms, interim milestones to reaching these targets, functional requirements, roles and responsibilities of National Laboratories and industry, acquisition strategy, and estimated resources required, to achieve this exascale system capability. The report shall include the Secretary's plan for Departmental organization to manage and execute the Exascale Computing Program, including definition of the roles and responsibilities within the Department to ensure an integrated program across the Department. The

report shall also include a plan for ensuring balance and prioritizing across ASCR subprograms in a flat or slow-growth budget environment.

`(B) STATUS REPORTS- At the time of the budget submission of the Department for each fiscal year, the Secretary shall submit a report to Congress that describes the status of milestones and costs in achieving the objectives of the exascale computing program.

`(C) EXASCALE MERIT REPORT- At least 18 months prior to the initiation of construction or installation of any exascale-class computing facility, the Secretary shall transmit a plan to the Congress detailing--

`(i) the proposed facility's cost projections and capabilities to significantly accelerate the development of new energy technologies;

`(ii) technical risks and challenges that must be overcome to achieve successful completion and operation of the facility; and

`(iii) an independent assessment of the scientific and technological advances expected from such a facility relative to those expected from a comparable investment in expanded research and applications at terascale-class and petascale-class computing facilities, including an evaluation of where investments should be made in the system software and algorithms to enable these advances.'.

**Section 104. High Energy Physics.**

(a) Program – The Director shall carry out a research program on the elementary constituents of matter and energy and the nature of space and time.

(b) Underground science stewardship.

(1) Purpose - The Director shall create, preserve, and maintain U.S. facilities essential to underground scientific research supported by the Department.

(2) Report - Not later than 120 days after the date of enactment of this Act and biennially thereafter, the Director shall submit to the Committee on Science, Space and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report on the activities to steward national leadership in underground science, including—

(A) Methods for coordination between the Office of High Energy Physics and the Office of Nuclear Physics.
(B) Demonstration of engagement with other relevant federal agencies including the National Science Foundation.
(C) Plans for sustaining and advancing U.S. leadership in underground science, particularly as they relate to development of scientific user facilities to explore the frontiers of particle physics and science in general.
(D) Identification of priorities in the area of underground science, taking into consideration previous Department of Energy and the National Research Council reports.

(3) Department of Energy grants in support of underground science - The Director shall carry out a competitive grant program to award scientists and engineers at institutions of higher education, nonprofit institutions, and national laboratories to conduct research in underground science and engineering.

**Section 105. Biological and Environmental Research.**

(a) Program – The Director shall carry out a program of research, development, and demonstration in the areas of biological systems science and climate and environmental science to support the energy and environmental missions of the Department.
(b) In General - In carrying out this section, the Director shall prioritize fundamental research on biological systems and genomics science with potential to enable technological solutions to challenges in areas such as energy, human health, manufacturing and other national priorities.
(c) Duplication - Not later than 15 months after enactment of this Act, the Comptroller General shall submit a report to Congress assessing the extent of fragmentation, overlap, and duplication between the climate science-related initiatives of the Biological and Environmental Research Office, and those of other federal agencies.
(d) Low Dose Radiation Research Program - The Director shall carry out a research program on low dose radiation. The purpose of the program is to enhance the scientific understanding of and reduce uncertainties associated with the effects of exposure to low dose radiation in order to inform improved risk management methods.
(1) Within 60 days of enactment of this Act, the Director shall enter into an agreement with the National Academies to conduct a study assessing the current status and development of a long-term strategy for low dose radiation research. The study should be conducted in coordination with federal agencies that perform ionizing radiation-effects research related to human health.
(2) The study performed under paragraph (1) shall:
(A) Identify current scientific challenges for understanding the long-term effects of ionizing radiation on disease causation in humans;

(B) assess the status of current low dose radiation research in the United States and internationally;
(C) formulate overall scientific goals for the future of low-dose radiation research in the US;
(D) recommend a long-term strategic and prioritized research agenda to address scientific research goals for overcoming the identified scientific challenges in coordination with other research efforts ;
(E) define the essential components of a research program that would address this research agenda within the universities and the national labs; and
(F) assess the cost-benefit effectiveness of such a program.

(3) Within 90 days of the completion of the assessment performed under paragraph (c) the Secretary shall deliver to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate, a five year research plan that responds to the assessment's findings and recommendations and identifies and prioritizes research needs.

**Section 106. Fusion Energy.**

(a) Program– The Director shall carry out a fusion energy sciences research program to expand the fundamental understanding of matter at very high temperatures and densities and to build the scientific foundation necessary to enable fusion power.

(b) Plan - Within thirty days of enactment of this Act, the Secretary shall charge and direct the Department's Fusion Energy Science Advisory Committee to prepare a draft plan for carrying out the program set forth in subsection (a). The Committee shall seek public comment on its proposed draft plan prior to submitting it to the Department. Within 18 months of the enactment of this Act, and after reviewing the draft plan prepared by the Committee, the Secretary shall submit a final plan to Committee on Science, Space and Technology in the House of Representatives and the Committee on Energy and Natural Resources in the Senate. In developing a final plan, the Secretary should consult other experts in fusion science and technology, engineering and operations, and other relevant fields.

(1) REQUIREMENTS OF PLAN – The plan described in subsection (b) shall include the following:

(A) An outline of the tasks required to resolve the remaining fusion energy scientific, engineering, and materials challenges, including a schedule for accomplishing these tasks. The outline shall specify how existing domestic experimental capabilities will contribute to this effort, and what additional capabilities, including facilities for materials, plasma

confinement, and fusion technologies, and advances in large scale computer simulations, will be needed within the United States;

(B) A path to develop conceptual designs and plans, costs, and schedules for building a demonstration power plant. These plans should address future customer considerations in terms of operability, reliability, and maintainability, and consider multiple budget scenarios;

(C) Involvement of any partners or collaborators, including consideration of how such partnerships or collaborations might be leveraged to decrease costs and or accelerate the schedule while enhancing U.S. leadership in fusion science and technology;

(2) National Academies Review – Not later than 18 months after the date of enactment of this Act, the Secretary shall enter into an arrangement with the National Academy of Sciences to review the plan outlined in subsection (b).

(3) Report to Congress – Within 90 days following the National Academy of Sciences Review Report, and based on the findings and recommendations from both the plan described in subsection (b) and the Academy review, the Secretary shall provide the Committee on Science, Space and Technology in the House of Representatives and the Committee on Energy and Natural Resources in the Senate with a ten-year cost estimate for the Office of Fusion Energy Sciences to implement the program described in subsection (a).

**Section 107. Nuclear Physics.**

(a) Program- The Director shall carry out a program of experimental and theoretical research, and support associated facilities, to discover, explore and understand all forms of nuclear matter.

(b) Isotope Development and Production for Research Applications- The Director shall carry out a program for the production of isotopes, including the development of techniques to produce isotopes, that the Secretary determines are needed for research or other purposes. In making this determination, the Secretary shall—

(1) ensure, consistent with Federal Register notice 30 Fed. Reg. 3247 1965, isotope production activities do not compete with private industry unless critical national interests necessitate the federal government's involvement; and

(2) consider any relevant recommendations made by Federal advisory committees, the National Academies, and interagency working groups in which the Department participates.

**Section 108. Transparency.**

(a) Cost Share - The Secretary shall make public all cost-share waivers granted under Section 988 of the Energy Policy Act of 2005 within 90 days of the waiver being issued. The information shall include –
    (1) Name of entity receiving the waiver;
    (2) justification for the reduction;
    (3) the final cost share percentage;
    (4) the amount of total cost share;
    (5) date; and
    (6) description of the supported project.

(b) Technology Transfer Agreements – The Secretary shall make public on an annual basis basic, non-proprietary information related to technology transfer agreements entered into by each National Laboratory with non-government entities, including –
    (1) Work for Others Agreements,
    (2) Cooperative Research and Development Agreements,
    (3) Agreements for Commercializing Technology.

(c) Financial Awards – The Secretary shall make public all grants, agreements and other financial support for all research, development, demonstration and commercial application activities within 90 days of an agreement. The information shall include –
    (1) Name of project recipient, including all project partners;
    (2) amount of award;
    (3) project description; and
    (4) expected timeframe of completion.

(d) Exemption – None of the information in this section shall conflict with specific exemptions listed in 5 USC 552 (b).

**Section 109. External Regulations.**

(a) The Secretary shall coordinate with the Occupational Safety and Health Administration and Nuclear Regulatory Commission to provide for the efficient external regulation of nuclear safety and occupational and health responsibilities at any nonmilitary energy laboratory owned or operated by the Department.

(b) Within one year of enactment of this act, the Secretary shall enter into a memorandum of understanding with the Nuclear Regulatory Commission establishing decommissioning procedures and requirements for nonmilitary energy laboratories owned or operated by the Department.

(c) Within one year of enactment of this act, the Nuclear Regulatory Commission and the Occupational Safety and Health Administration shall enter into and transmit to the Congress a memorandum of understanding to govern the exercise of their respective authorities over nuclear safety and occupational safety and health of nonmilitary energy laboratories owned or operated by the Department.

(d) Within 18 months of enactment of this act, the Secretary shall transmit to the Congress a plan for the termination of the Departments regulatory and enforcement responsibilities for nonmilitary energy laboratories owned or operated by the Department.

**Section 110. Technology Transfer.**

(a) The Secretary shall delegate to Directors of the National Laboratories signature authority for technology transfer agreements with a total cost under $500,000, including both National Laboratory contributions and project recipient cost share. The agreements include –
    (1) Cooperative Research and Development Agreements,
    (2) Non-federal Work for Others Agreements,
    (3) Agreements for Commercializing Technology.

**Sec. 111. National Energy Technology Laboratory.**

(a) Within 60 days of enactment of this Act, the Undersecretary shall enter into contract with National Academy of Public Administration to conduct a study assessing the management and operations of the National Energy Technology Laboratory.
(b) The assessment performed under subsection (a) shall:
    (1) evaluate the current status of laboratory management;
    (2) assess the cost-benefit associated with operating the laboratory as a government-owned, government-operated model compared to a government-owned, contractor--operated model; and
    (3) identify challenges of transitioning the laboratory to a government-owned, contractor-operated model.

(c) Within 90 days of the completion of the assessment performed under subsection (a) the Secretary shall deliver to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate, a response to the findings and recommendations of the report and identify a strategy to transition the laboratory to a government-owned, contractor-operated facility.

**Section 112. Definitions.**

In this Act:

    (1) Department – The term "Department" means the Department of Energy.
    (2) Director – The term "Director" means the Director of the Office of Science.
    (3) Office of Science – The term "Office of Science" means the Department of Energy Office of Science.
    (4) Secretary – The term "Secretary" means the Secretary of Energy.
    (5) Under Secretary – The term "Under Secretary" means the Under Secretary for Science.

(6) National Laboratories – The term "National Laboratories" means Department of Energy nonmilitary national laboratories, including –

(i) Ames Laboratory,
(ii) Argonne National Laboratory,
(iii) Brookhaven National Laboratory,
(iv) Fermi National Accelerator Laboratory,
(v) Idaho National Laboratory,
(vi) Lawrence Berkeley National Laboratory,
(vii) National Energy Technology Laboratory,
(viii) National Renewable Energy Laboratory,
(ix) Oak Ridge National Laboratory,
(x) Pacific Northwest National Laboratory,
(xi) Princeton Plasma Physics Laboratory,
(xii) Savannah River National Laboratory,
(xiii) Stanford Linear Accelerator Center,
(xiv) Thomas Jefferson National Accelerator Facility.

**Section 113. Authorization of Appropriations.**

(a) Out of funds appropriated for Department of Energy civilian research, development, demonstration and commercial application activities, there are authorized to be appropriated to the Secretary for the activities of the Office of Science –

(1) $4,700,000,000 for fiscal year 2014, of which –
   (A) $1,630,000,000 shall be for Basic Energy Sciences activities under section 102;
   (B) $440,000,000 shall be for Advanced Scientific Computing Research activities under section 103;
   (C) $780,000,000 shall be for High Energy Physics activities under section 104;

(2) $4,747,000,000 for fiscal year 2015, of which –
   (A) $1,654,000,000 shall be for Basic Energy Sciences activities under section 102;
   (B) $446,000,000 shall be for Advanced Scientific Computing Research activities under section 103;
   (C) $791,000,000 shall be for High Energy Physics activities under section 104

**SEC. 114. BUDGET CONTROL.**

The amounts authorized to be appropriated to the Administration for fiscal years 2014 and 2015 are consistent with the Budget Control Act of 2011 (Public Law 112-25). If such Act is repealed or replaced with an Act that increases allocations, there are authorized to be appropriated to the Administration such sums as that increase allows, with increases allocated as follows:

(1) One-third of such increase shall be for the Basic Energy Sciences.

(2) One-third of such increase shall be for the Advanced Scientific Computing Research.

(3) One-third of such increase shall be designated for remaining Office of Science activities.