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107TH CONGRESS
2D SESSION

H. R. 5270

To authorize appropriations for fiscal years 2003, 2004, 2005, and 2006 for the Department of Energy Office of Science, to ensure that the United States is the world leader in key scientific fields by restoring a healthy balance of science funding, to ensure maximum utilization of the national user facilities, and to secure the Nation's supply of scientists for the 21st century, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

JULY 26, 2002

Mrs. BIGGERT (for herself, Mr. EHLERS, Mrs. TAUSCHER, Ms. WOOLSEY, Mr. GRUCCI, Mr. HOLT, Mr. HONDA, Mr. WAMP, Mr. JOHNSON of Illinois, Mr. ANDREWS, Mr. CALVERT, Mr. HOUGHTON, Mr. HASTINGS of Washington, Mr. RUSH, Mr. CAPUANO, and Mr. BOSWELL) introduced the following bill; which was referred to the Committee on Science

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A BILL

To authorize appropriations for fiscal years 2003, 2004, 2005, and 2006 for the Department of Energy Office of Science, to ensure that the United States is the world leader in key scientific fields by restoring a healthy balance of science funding, to ensure maximum utilization of the national user facilities, and to secure the Nation's supply of scientists for the 21st century, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the ''Energy and Science Research Investment Act of 2002''.

SEC. 2. FINDINGS.

Congress makes the following findings:

(1) The Department of Energy Office of Science is the Nation's primary supporter of the physical sciences, providing an important partner and key user facilities in the areas of biological or life sciences, physics, chemistry, environmental sciences, mathematics, computer science, and engineering. More specifically, the Office of Science is the steward, and principal funding agency, of the Nation's research programs in high-energy physics, nuclear physics, and fusion energy sciences, and is the Federal Government's single largest funder of materials and chemical sciences. It also manages programs of fundamental research in basic energy sciences, biological and environmental sciences, and computational science, all of which support the Department's other mission in environmental restoration, defense, and energy security. The Office of Science also supports unique or critical pieces of United States research in climate change, geophysics, genomics, and the life sciences.

(2) The Department of Energy Office of Science supports a unique system of programs based on large-scale, specialized user facilities and large, interdisciplinary teams of scientists focused on national priorities in scientific research. This Federal research and development funding goes to scientists and students not just at our national labs, but at our colleges and universities as well. The Office of Science allocates almost 20 percent of its budget to university-based research, with 49 States receiving funding. This makes the Office of Science unique among, and complementary to, the scientific programs of many other Federal science agencies, including the National Institutes of Health and the National Science Foundation.

(3) While investments in these agencies have increased, for the most part these increases have not gone to support physical science and engineering, according to the National Research Council. In constant dollars, the Federal investment in the physical and engineering sciences has stagnated for the last 30 years; the budget for the Department of Energy Office of Science is still only at its 1990 level. During that same 30-year period, the Federal investment in medical and life sciences has more than tri-

pled, according to the National Science Foundation and American Association for the Advancement of Science. The growing imbalance between biomedical fields and physical sciences and engineering research in the United States investment portfolio will hamper the vital connections and reliance among fields of science.

(4) According to a report entitled ''Road Map for National Security Imperative for Change'', by the United States Commission on National Security in the 21st Century, ''. . . the U.S. government has seriously underfunded basic scientific research in recent years. The quality of the U.S. education system, too, has fallen well behind those of scores of other nations. . . . The inadequacies of our systems of research and education pose a greater threat to U.S. national security over the next quarter century than any potential conventional war that we might imagine.'' The national laboratories and research universities have a demonstrated ability to form interdisciplinary teams capable of addressing national crises, such as the current threat of biological, chemical, and nuclear terrorism.

(5) Department of Energy research in the physical sciences and engineering has produced the

knowledge that enabled major medical breakthroughs and technological advances such as diagnostic x-rays, Ultrasounds, PET Scans, and MRI's. Basic research initiated by the Department of Energy Office of Science in 1986 culminated in the publication of a complete draft of the Human Genome sequence in February 2001. This breakthrough holds the promise of deepening the understanding of fundamental life processes and then, treatment and cures of disease. Future medical advances and technological breakthroughs will continue to rely heavily upon the critical disciplines of science and engineering supported by the Department of Energy.

(6) Many of the energy and environmental technologies that we take for granted today have come from Department of Energy science programs. Basic energy research funded by the Department of Energy Office of Science will help address current and future energy challenges with technologies that improve the efficiency, economy, environmental acceptability, and safety in energy generation, conversion, transmission, and use. For example, basic energy research at the Department of Energy is largely responsible for continued reductions in carbon dioxide

emissions from fossil fuels as well as from substantial improvements in the efficiency and affordability of solar, wind, biomass conversion, and other renewable energy sources. Department of Energy basic energy research is also playing a central role in helping to create new technologies—such as fuel cells—which will eliminate harmful automobile emissions. Our future economic strength will be strongly tied to the cost and availability of energy.

(7) Fully half the growth of the United States economy in the last 50 years was due to the Federal investment in scientific and technological innovation, much of which flowed from our Nation's research universities and national laboratories. Computers, the Internet, fiber optics, communications equipment and technology, consumer electronics, defense technologies, global positioning systems, and catalytic converters are but a few examples of the contributions of the physical sciences to the overall strength of our economy.

(8) The Office of Science has prime responsibility for developing, constructing and operating some of the Nation's most advanced research and development facilities, located at national laboratories and universities. These national research fa-

cilities, including the synchrotron light sources, neutron sources and high-energy and heavy-ion accelerators, are used annually by more than 17,000 researchers from universities, other government agencies, and private industry from across the country and around the world. Users of the facilities include academic scientists sponsored by many Federal agencies, among them the Department of Defense, the National Aeronautics and Space Administration, the National Institutes of Health, the National Institute of Standards and Technology, and the National Science Foundation, as well as the Department of Energy, itself.

(9) Despite long queues of experiments, many of the Department's facilities often operate at less than full capacity because of operating budget strictures. Furthermore, reductions in facilities research and development budgets are now jeopardizing the development of the next generation of accelerators, upon which many areas of science depend.

(10) The Council on Competitiveness projects that the number of jobs requiring technical skills will grow by more than 50 percent over a 10-year period ending in 2008, and the Department of Energy estimates that almost 50 percent of its science and tech-

nology managers will be eligible for retirement in the next 5 years. By contrast, and reflecting constrained research budgets, university enrollment in the physical sciences has shrunk by more than 10 percent during the last decade, and graduate programs have come to rely heavily on foreign students, with non-United States citizens now accounting for more than 50 percent of Ph.D. recipients in most fields. However, during the period 1996 to 1999, according to the National Science Board, foreign enrollment in the physical sciences has fallen by 15 percent.

(11) The Department of Energy Office of Science plays a critical role in supplying the scientific workforce of the future. Each year, it supports more than 11,000 students and post-doctoral investigators who eventually enter industry, academia, or government laboratories. The national laboratories also provide internships for undergraduates in universities and community colleges, who represent the base of the next generation of the Nation's scientific workforce.

(12) Current appropriation levels allow the Office of Science to fund only 10 percent of the unsolicited peer-reviewed proposals it receives annually. By contrast, the National Science Foundation is able

to fund 33 percent of the proposals it receives from a similar applicant pool.

(13) Increased allocations would enable the Office of Science to take advantage of scientific opportunities in key spheres central to the mission of the Department of Energy. These include Homeland Security, particularly in the area of sensing and tracking of biological, chemical and radiological weapons; advanced energy technologies, among them fusion and hydrogen; climate science, especially investigations requiring complex computer simulations; the search for dark energy; multidisciplinary biotechnology, highlighted by the Genomes to Life program; the expansion of nanoscale research, especially where advances rely on Department's strength of interdisciplinary programming; upgrades of existing synchrotron light sources, particularly for structural biology and materials research; accelerator research and development, especially for the development of the next generation of x-ray light sources and the Linear Collider project; and environmental science, particularly the application of bioremediation to toxic sites. Added budget capability would also allow the Department to expand its graduate fellowship program and its laboratory internship program that

are vital to developing the technical workforce of the 21st century.

(14) Budgetary constraints have restricted the development and construction of new scientific facilities, one of the central missions of the Office of Science. The list of proposed construction projects that have already undergone significant scientific study has grown considerably. It includes the Linear Coherent Light Source (LCLS), the Rare Isotope Accelerator (RIA), the National Compact Stellerator Experiment (NCSX), the upgrade of the Continuous Electron Beam Accelerator Facility (CEBAF), the high-energy physics Linear Collider Project, the Super Nova/Acceleration Probe (SNAP), and the International Thermonuclear Experimental Reactor (ITER). Deferred maintenance has also created a backlog of infrastructure construction projects at many of the Department's laboratories.

TITLE I—OFFICE OF SCIENCE AUTHORIZATION

SEC. 101. AUTHORIZATION OF APPROPRIATIONS.

(a) PROGRAM DIRECTION.—The Secretary of Energy, acting through the Office of Science, shall—

(1) conduct a comprehensive program of fundamental research, including research on chemical

sciences, physics, materials sciences, biological and environmental sciences, geosciences, engineering sciences, plasma sciences, mathematics, and advanced scientific computing;

(2) maintain, upgrade, and expand the scientific user facilities maintained by the Office of Science and ensure that they are an integral part of the departmental mission for exploring the frontiers of fundamental science;

(3) maintain a leading-edge research capability in the energy-related aspects of nanoscience and nanotechnology, advanced scientific computing and genome research; and

(4) ensure that its fundamental science programs, where appropriate, help inform the applied research and development programs of the Department.

(b) FISCAL YEAR 2003.—

(1) IN GENERAL.—There are authorized to be appropriated to the Office of Science $3,492,000,000 for fiscal year 2003.

(2) SPECIFIC ALLOCATIONS.—The amount authorized under paragraph (1) shall be allocated as follows:

(A) General research activities (including university programs, facilities operations, national laboratory programs, accelerator research and development, workforce development, construction carryovers from years prior to fiscal year 2003, and program administration): $3,402,000,000.

(B) Initiatives consistent with interagency guidance (among them nanoscience centers, advanced complex-simulation computing, and Genomes-to-Life centers): $40,000,000.

(C) New construction: $50,000,000.

(b) FISCAL YEAR 2004.—

(1) IN GENERAL.—There are authorized to be appropriated to the Office of Science $4,015,000,000 for fiscal year 2004.

(2) SPECIFIC ALLOCATIONS.—The amount authorized under paragraph (1) shall be allocated as follows:

(A) General research activities (including university programs, facilities operations, national laboratory programs, accelerator research and development, workforce development, construction carryovers from years prior to fiscal

year 2003, and program administration): $3,820,000,000.

(B) Initiatives consistent with interagency guidance (among them nanoscience centers, advanced complex-simulation computing, and Genomes-to-Life centers): $130,000,000.

(C) New construction: $65,000,000.

(c) FISCAL YEAR 2005.—

(1) IN GENERAL.—There are authorized to be appropriated to the Office of Science $4,618,000,000 for fiscal year 2005.

(2) SPECIFIC ALLOCATIONS.—The amount authorized under paragraph (1) shall be allocated as follows:

(A) General research activities (including university programs, facilities operations, national laboratory programs, accelerator research and development, workforce development, construction carryovers from years prior to fiscal year 2003, and program administration): $4,243,000,000.

(B) Initiatives consistent with interagency guidance (among them nanoscience centers, advanced complex-simulation computing, and Genomes-to-Life centers): $205,000,000.

(C) New construction: $170,000,000.

(d) FISCAL YEAR 2006.—

(1) IN GENERAL.—There are authorized to be appropriated to the Office of Science $5,310,000,000 for fiscal year 2006.

(2) SPECIFIC ALLOCATIONS.—The amount authorized under paragraph (1) shall be allocated as follows:

(A) General research activities (including university programs, facilities operations, national laboratory programs, accelerator research and development, workforce development, construction carryovers from years prior to fiscal year 2003, and program administration): $4,815,000,000.

(B) Initiatives consistent with interagency guidance (among them nanoscience centers, advanced complex-simulation computing, and Genomes-to-Life centers): $215,000,000.

(C) New construction: $280,000,000.

SEC. 102. REPORTING.

Not later than 60 days after the date of enactment of legislation providing for the annual appropriation of funds for the Office of Science, the Director of the Office of Science, henceforth referred to as the Assistant Sec-

retary of Science, in accordance with section 201(b) of this Act, shall submit to the Committee on Science of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a plan for the allocation of funds authorized by this Act for the corresponding fiscal year. The plan shall include a description of how the allocation of funding will—

(1) affect trends in research support for major fields and subfields of the physical sciences, mathematics, and engineering, including emerging multidisciplinary areas;

(2) affect the utilization of the Department's facilities;

(3) address the workforce needs by field of science, mathematics, and engineering; and

(4) ensure that research in the physical sciences, mathematics, and engineering is adequate to address important research opportunities in these fields.

TITLE II—SCIENCE MANAGEMENT

SEC. 201. IMPROVED COORDINATION AND MANAGEMENT OF CIVILIAN SCIENCE AND TECHNOLOGY PROGRAMS.

(a) EFFECTIVE TOP-LEVEL COORDINATION OF RESEARCH AND DEVELOPMENT PROGRAMS.—Section 202(b) of the Department of Energy Organization Act (42 U.S.C. 7132(b)) is amended to read as follows:

''(b)(1) There shall be in the Department an Under Secretary for Energy Research and Science, who shall be appointed by the President, by and with the advice and consent of the Senate. The Under Secretary shall be compensated at the rate provided for at level III of the Executive Schedule under section 5314 of title 5, United States Code.

''(2) The Under Secretary for Energy Research and Science shall be appointed from among persons who—

''(A) have extensive background in scientific or engineering fields; and

''(B) are well qualified to manage the civilian research and development programs of the Department of Energy.

''(3) The Under Secretary for Energy Research and Science shall—

''(A) serve as the Science and Technology Advisor to the Secretary;

''(B) monitor the Department's research and development programs in order to advise the Secretary with respect to any undesirable duplication or gaps in such programs;

''(C) advise the Secretary with respect to the well-being and management of the science laboratories under the jurisdiction of the Department;

''(D) advise the Secretary with respect to education and training activities required for effective short- and long-term basic and applied research activities of the Department;

''(E) advise the Secretary with respect to grants and other forms of financial assistance required for effective short- and long-term basic and applied research activities of the Department; and

''(F) exercise authority and responsibility over Assistant Secretaries carrying out energy research and development and energy technology functions under sections 203 and 209, as well as other elements of the Department assigned by the Secretary.''.

(b) RECONFIGURATION OF POSITION OF DIRECTOR OF THE OFFICE OF SCIENCE.—Section 209 of the Depart-

ment of Energy Organization Act (41 U.S.C. 7139) is amended to read as follows:

''OFFICE OF SCIENCE

''SEC. 209. (a) There shall be within the Department an Office of Science, to be headed by an Assistant Secretary of Science, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall be compensated at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.

''(b) The Assistant Secretary of Science shall be in addition to the Assistant Secretaries provided for under section 203 of this Act.

''(c) It shall be the duty and responsibility of the Assistant Secretary of Science to carry out the fundamental science and engineering research functions of the Department, including the responsibility for policy and management of such research, as well as other functions vested in the Secretary which he may assign to the Assistant Secretary.''.

(c) ADDITIONAL ASSISTANT SECRETARY POSITION TO ENABLE IMPROVED MANAGEMENT OF NUCLEAR ENERGY ISSUES.—(1) Section 203(a) of the Department of Energy Organization Act (42 U.S.C. 7133(a)) is amended by striking ''There shall be in the Department six Assistant Secretaries'' and inserting ''Except as provided in sec-

tion 209, there shall be in the Department seven Assistant Secretaries''.

(2) It is the sense of the House of Representatives that the leadership for departmental missions in nuclear energy should be at the Assistant Secretary level.

(d) TECHNICAL AND CONFORMING AMENDMENTS.—(1) Section 202 of the Department of Energy Organization Act (42 U.S.C. 7132) is further amended by adding the following at the end:

''(d) There shall be in the Department an Under Secretary, who shall be appointed by the President, by and with the advice and consent of the Senate, and who shall perform such functions and duties as the Secretary shall prescribe, consistent with this section. The Under Secretary shall be compensated at the rate provided for level III of the Executive Schedule under section 5314 of title 5, United States Code.

''(e) There shall be in the Department a General Counsel, who shall be appointed by the President, by and with the advice and consent of the Senate. The General Counsel shall be compensated at the rate provided for level IV of the Executive Schedule under section 5315 of title 5, United States Code.''.

(2) Section 5314 of title 5, United States Code, is amended by striking ''Under Secretaries of Energy (2)'' and inserting ''Under Secretaries of Energy (3)''.

(3) Section 5315 of title 5, United States Code, is amended by—

(A) striking ''Director, Office of Science, Department of Energy.''; and

(B) striking ''Assistant Secretaries of Energy (6)'' and inserting ''Assistant Secretaries of Energy (8)''.

(4) The table of contents for the Department of Energy Organization Act (42 U.S.C. 7101 note) is amended—

(A) by striking ''Section 209'' and inserting ''Sec. 209'';

(B) by striking ''213.'' and inserting ''Sec. 213.'';

(C) by striking ''214.'' and inserting ''Sec. 214.'';

(D) by striking ''215.'' and inserting ''Sec. 215.''; and

(E) by striking ''216.'' and inserting ''Sec. 216.''.

SEC. 202. SCIENCE ADVISORY BOARD FOR THE OFFICE OF SCIENCE.

(a) ESTABLISHMENT.—There shall be in the Office of Science a Science Advisory Board, comprising the chairs of the advisory panels for each of the programs.

(b) RESPONSIBILITIES.—The Science Advisory Board shall—

(1) serve as the science advisor to the Assistant Secretary of Science;

(2) advise the Assistant Secretary with respect to the well-being and management of the multipurpose laboratories;

(3) advise the Assistant Secretary with respect to education and workforce-training activities required for effective short- and long-term basic and applied research activities of the Office of Science; and

(4) advise the Assistant Secretary with respect to the well-being of the university research programs supported by the Office of Science.

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