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112TH CONGRESS
2D SESSION

H. R. 6454

To amend the Department of Energy High-End Computing Revitalization Act of 2004 to improve the high-end computing research and development program of the Department of Energy, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 20, 2012

Mrs. BIGGERT introduced the following bill; which was referred to the Committee on Science, Space, and Technology

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A BILL

To amend the Department of Energy High-End Computing Revitalization Act of 2004 to improve the high-end computing research and development program of the Department of Energy, 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 ''Department of Energy High-End Computing Act of 2012''.

SEC. 2. 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—

(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.

SEC. 3. 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)(1), by striking ''program'' and inserting ''coordinated program across the Department'';

(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''; and

(3) 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 one or more exascale computing systems to advance the missions of the Department.

"(2) EXECUTION.—The Secretary shall through competitive merit review establish two or more National Laboratory-industry partnerships to conduct integrated research, development, and engineering of one or more prototype exascale systems, and—

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

"(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.

"(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 plat-

forms 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 Department of Energy High-End Computing Act of 2012, 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.

"(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.".

SEC. 4. AUTHORIZATION OF APPROPRIATIONS.

Section 4 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5543) is amended—

(1) by striking ''this Act'' and inserting ''section 3(d)''; and

(2) by striking paragraphs (1) through (3) and inserting the following:

(A) $110,000,000 for fiscal year 2013;

(B) $195,000,000 for fiscal year 2014; and

(C) $260,000,000 for fiscal year 2015.

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