113TH CONGRESS
1ST SESSION
S. 733

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 SENATE OF THE UNITED STATES

APRIL 16, 2013

Mr. ALEXANDER (for himself, Mr. DURBIN, Mr. WYDEN, Mr. HEINRICH, Ms. MURKOWSKI, Mr. COONS, Mr. UDALL of New Mexico, and Mr. KIRK) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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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.

1   *Be it enacted by the Senate and House of Representa-*

2 *tives of the United States of America in Congress assembled,*

3   **SECTION 1. SHORT TITLE.**

4   This Act may be cited as the "Exascale Computing

5   for Science, Competitiveness, Advanced Manufacturing,

6   Leadership, and the Economy Act of 2013" or

7   "ExaSCALE Computing Leadership Act of 2013".

SEC. 2. RENAMING OF ACT.

(a) IN GENERAL.—Section 1 of the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5501 note; Public Law 108–423) is amended by striking "Department of Energy High-End Computing Revitalization Act of 2004" and inserting "Exascale Computing for Science, Competitiveness, Advanced Manufacturing, Leadership, and the Economy Act of 2013".

(b) CONFORMING AMENDMENT.—Section 976(a)(1) of the Energy Policy Act of 2005 (42 U.S.C. 16316(1)) is amended by striking "Department of Energy High-End Computing Revitalization Act of 2004" and inserting "Exascale Computing for Science, Competitiveness, Advanced Manufacturing, Leadership, and the Economy Act of 2013".

SEC. 3. DEFINITIONS.

Section 2 of the Exascale Computing for Science, Competitiveness, Advanced Manufacturing, Leadership, and the Economy Act of 2013 (15 U.S.C. 5541) is amended—

(1) by redesignating paragraphs (2) through (5) as paragraphs (3) through (6), respectively;

(2) by striking paragraph (1) and inserting the following:

"(1) DEPARTMENT.—The term 'Department' means the Department of Energy.

1 ''(2) EXASCALE COMPUTING.—The term
2 'exascale computing' means computing through the
3 use of a computing machine that performs near or
4 above 10 to the 18th power floating point operations
5 per second.''; and

6 (3) in paragraph (6) (as redesignated by para-
7 graph (1)), by striking '', acting through the Direc-
8 tor of the Office of Science of the Department of
9 Energy''.

10 **SEC. 4. DEPARTMENT OF ENERGY HIGH-END COMPUTING**
11 **RESEARCH AND DEVELOPMENT PROGRAM.**

12 Section 3 of the Exascale Computing for Science,
13 Competitiveness, Advanced Manufacturing, Leadership,
14 and the Economy Act of 2013 (15 U.S.C. 5542) is amend-
15 ed—

16 (1) in subsection (a)(1), by striking ''program''
17 and inserting ''coordinated program across the De-
18 partment'';

19 (2) in subsection (b)(2), by striking '', which
20 may'' and all that follows through ''architectures'';
21 and

22 (3) by striking subsection (d) and inserting the
23 following:

24 ''(d) EXASCALE COMPUTING PROGRAM.—

1 ''(1) IN GENERAL.—The Secretary shall con-
2 duct a research program (referred to in this sub-
3 section as the 'program') to develop 2 or more
4 exascale computing machines to promote the mis-
5 sions of the Department.

6 ''(2) PARTNERSHIPS.—In carrying out the pro-
7 gram, the Secretary shall establish 2 or more na-
8 tional laboratory-industry partnerships for the re-
9 search and development of 2 or more exascale com-
10 puting machines across all applicable agencies of the
11 Department.

12 ''(3) CODESIGN AND APPLICATION DEVELOP-
13 MENT.—The Secretary shall carry out the program
14 through an integration of application, computer
15 science, and computer hardware architecture using
16 public-private partnerships to ensure that, to the
17 maximum extent practicable, 2 or more exascale
18 computing machines are capable of solving Depart-
19 ment target applications and scientific problems.

20 ''(4) PROJECT REVIEW.—The exascale com-
21 puting machines described in paragraph (2) shall be
22 reviewed through a project review process.

23 ''(5) ANNUAL REPORTS.—At the time of the
24 budget submission of the Department for each fiscal
25 year, the Secretary shall submit to Congress a re-

1 port that describes funding for the exascale com-

2 puting program as a whole by functional element of

3 the Department and critical milestones.

4 "(6) FUNDING.—The Secretary shall use exist-

5 ing funds to carry out the program.".

6 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS.**

7 Section 4 of the Exascale Computing for Science,

8 Competitiveness, Advanced Manufacturing, Leadership,

9 and the Economy Act of 2013 (15 U.S.C. 5543) is amend-

10 ed—

11 (1) by striking "this Act" and inserting "sec-

12 tion 3(d)"; and

13 (2) by striking paragraphs (1) through (3) and

14 inserting the following:

15 "(1) $160,000,000 for fiscal year 2014;

16 "(2) $200,000,000 for fiscal year 2015; and

17 "(3) $220,000,000 for fiscal year 2016.".

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