In the Senate of the United States,

October 10, 2004.

Resolved, That the bill from the House of Representatives (H.R. 4516) entitled "An Act to require the Secretary of Energy to carry out a program of research and development to advance high-end computing.", do pass with the following

AMENDMENT:

Strike out all after the enacting clause and insert:

1 ***SECTION 1. SHORT TITLE.***

2   *This Act may be cited as the "Department of Energy*

3 *High-End Computing Revitalization Act of 2004".*

SEC. 2. DEFINITIONS.

In this Act:

(1) CENTER.—The term "Center" means a High-End Software Development Center established under section 3(d).

(2) 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.

(3) LEADERSHIP SYSTEM.—The term "Leadership System" means a high-end computing system that is among the most advanced in the world in terms of performance in solving scientific and engineering problems.

(4) 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)).

(5) SECRETARY.—The term "Secretary" means the Secretary of Energy, acting through the Director of the Office of Science of the Department of Energy.

SEC. 3. DEPARTMENT OF ENERGY HIGH-END COMPUTING RESEARCH AND DEVELOPMENT PROGRAM.

(a) IN GENERAL.—The Secretary shall—

1   *(1) carry out a program of research and develop-*

2 *ment (including development of software and hard-*

3 *ware) to advance high-end computing systems; and*

4   *(2) develop and deploy high-end computing sys-*

5 *tems for advanced scientific and engineering applica-*

6 *tions.*

7 *(b) PROGRAM.—The program shall—*

8   *(1) support both individual investigators and*

9 *multidisciplinary teams of investigators;*

10   *(2) conduct research in multiple architectures,*

11 *which may include vector, reconfigurable logic,*

12 *streaming, processor-in-memory, and multithreading*

13 *architectures;*

14   *(3) conduct research on software for high-end*

15 *computing systems, including research on algorithms,*

16 *programming environments, tools, languages, and op-*

17 *erating systems for high-end computing systems, in*

18 *collaboration with architecture development efforts;*

19   *(4) provide for sustained access by the research*

20 *community in the United States to high-end com-*

21 *puting systems and to Leadership Systems, including*

22 *provision of technical support for users of such sys-*

23 *tems;*

1   *(5) support technology transfer to the private*

2 *sector and others in accordance with applicable law;*

3 *and*

4   *(6) ensure that the high-end computing activities*

5 *of the Department of Energy are coordinated with rel-*

6 *evant activities in industry and with other Federal*

7 *agencies, including the National Science Foundation,*

8 *the Defense Advanced Research Projects Agency, the*

9 *National Nuclear Security Administration, the Na-*

10 *tional Security Agency, the National Institutes of*

11 *Health, the National Aeronautics and Space Admin-*

12 *istration, the National Oceanic and Atmospheric Ad-*

13 *ministration, the National Institutes of Standards*

14 *and Technology, and the Environmental Protection*

15 *Agency.*

16 *(c) LEADERSHIP SYSTEMS FACILITIES.—*

17   *(1) IN GENERAL.—As part of the program car-*

18 *ried out under this Act, the Secretary shall establish*

19 *and operate 1 or more Leadership Systems facilities*

20 *to—*

21   *(A) conduct advanced scientific and engi-*

22 *neering research and development using Leader-*

23 *ship Systems; and*

24   *(B) develop potential advancements in high-*

25 *end computing system hardware and software.*

5

1   *(2) ADMINISTRATION.—In carrying out this sub-*

2 *section, the Secretary shall provide to Leadership Sys-*

3 *tems, on a competitive, merit-reviewed basis, access to*

4 *researchers in United States industry, institutions of*

5 *higher education, national laboratories, and other*

6 *Federal agencies.*

7   *(d) HIGH-END SOFTWARE DEVELOPMENT CENTER.—*

8   *(1) IN GENERAL.—As part of the program car-*

9 *ried out under this Act, the Secretary shall establish*

10 *at least 1 High-End Software Development Center.*

11   *(2) DUTIES.—A Center shall concentrate efforts*

12 *to develop, test, maintain, and support optimal algo-*

13 *rithms, programming environments, tools, languages,*

14 *and operating systems for high-end computing sys-*

15 *tems.*

16   *(3) PROPOSALS.—In soliciting proposals for the*

17 *Center, the Secretary shall encourage staffing ar-*

18 *rangements that include both permanent staff and a*

19 *rotating staff of researchers from other institutions*

20 *and industry to assist in coordination of research ef-*

21 *forts and promote technology transfer to the private*

22 *sector.*

23   *(4) USE OF EXPERTISE.—The Secretary shall*

24 *use the expertise of a Center to assess research and de-*

25 *velopment in high-end computing system architecture.*

1   *(5) SELECTION.—The selection of a Center shall*

2   *be determined by a competitive proposal process ad-*

3   *ministered by the Secretary.*

4 **SEC. 4. AUTHORIZATION OF APPROPRIATIONS.**

5   *In addition to amounts otherwise made available for*

6 *high-end computing, there are authorized to be appro-*

7 *priated to the Secretary to carry out this Act—*

8   *(1) $50,000,000 for fiscal year 2005;*

9   *(2) $55,000,000 for fiscal year 2006; and*

10   *(3) $60,000,000 for fiscal year 2007.*

11 **SEC. 5. ASTRONOMY AND ASTROPHYSICS ADVISORY COM-**

12   **MITTEE.**

13   *(a) AMENDMENTS.—Section 23 of the National Science*

14 *Foundation Authorization Act of 2002 (42 U.S.C. 1862n–*

15 *9) is amended—*

16   *(1) in subsection (a) and paragraphs (1) and (2)*

17   *of subsection (b), by striking "and the National Aero-*

18   *nautics and Space Administration" and inserting ",*

19   *the National Aeronautics and Space Administration,*

20   *and the Department of Energy";*

21   *(2) in subsection (b)(3), by striking "Adminis-*

22   *tration, and" and inserting "Administration, the Sec-*

23   *retary of Energy, ";*

24   *(3) in subsection (c)—*

*(A) in paragraphs (1) and (2), by striking
"5" and inserting "4";*

*(B) in paragraph (2), by striking "and" at
the end;*

*(C) by redesignating paragraph (3) as
paragraph (4), and in that paragraph by strik-
ing "3" and inserting "2"; and*

*(D) by inserting after paragraph (2) the fol-
lowing:*

*"(3) 3 members selected by the Secretary of En-
ergy; and*

*(4) in subsection (f), by striking "the advisory
bodies of other Federal agencies, such as the Depart-
ment of Energy, which may engage in related re-
search activities" and inserting "other Federal advi-
sory committees that advise Federal agencies that en-
gage in related research activities".*

*(b) EFFECTIVE DATE.—The amendments made by sub-
section (a) take effect on March 15, 2005.*

1 ***SEC. 6. REMOVAL OF SUNSET PROVISION FROM SAVINGS IN***

2 ***CONSTRUCTION ACT OF 1996.***

3 *Section 14 of the Metric Conversion Act of 1975 (15*

4 *U.S.C. 205l) is amended by striking subsection (e).*

Attest:

Secretary.