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109TH CONGRESS
2^D SESSION

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[Report No. 109-249]

To improve the global competitiveness of the United States in science and energy technology, to strengthen basic research programs at the Department of Energy, and to provide support for mathematics and science education at all levels through the resources available through the Department of Energy, including at the National Laboratories.

IN THE SENATE OF THE UNITED STATES

JANUARY 26, 2006

Mr. DOMENICI (for himself, Mr. BINGAMAN, Mr. ALEXANDER, Ms. MIKULSKI, Mr. LUGAR, Mr. DODD, Mr. HATCH, Mr. OBAMA, Mr. WARNER, Mr. LIEBERMAN, Mr. BOND, Mrs. MURRAY, Mr. BURNS, Mr. BAYH, Mr. CRAIG, Ms. CANTWELL, Mrs. HUTCHISON, Mr. MENENDEZ, Mr. DEWINE, Mr. KOHL, Mr. THOMAS, Mr. KERRY, Mr. SMITH, Mr. NELSON of Florida, Mr. VOINOVICH, Mr. LEAHY, Mr. ALLEN, Mr. AKAKA, Mr. TALENT, Mrs. CLINTON, Mr. CHAMBLISS, Ms. STABENOW, Mr. CORNYN, Mr. DAYTON, Mr. COLEMAN, Mr. SALAZAR, Mr. MARTINEZ, Mr. INOUE, Mr. STEVENS, Mr. BIDEN, Mr. COCHRAN, Mr. HAGEL, Ms. MURKOWSKI, Mr. PRYOR, Ms. COLLINS, Mr. VITTER, Ms. LANDRIEU, Mr. LAUTENBERG, Mr. JOHNSON, Mr. MCCONNELL, Ms. SNOWE, Mr. SPECTER, Mr. REED, Mr. FRIST, Mr. SCHUMER, Mr. DORGAN, Mr. SARBANES, Mr. REID, Mr. ROCKEFELLER, Mr. CARPER, Mr. BUNNING, Mr. BURR, Mr. GRASSLEY, Mr. HARKIN, Mrs. LINCOLN, Mrs. BOXER, and Mr. CRAPO) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

APRIL 24, 2006

Reported by Mr. DOMENICI, with an amendment

[Strike out all after the enacting clause and insert the part printed in italic]

A BILL

To improve the global competitiveness of the United States in science and energy technology, to strengthen basic research programs at the Department of Energy, and to provide support for mathematics and science education at all levels through the resources available through the Department of Energy, including at the National Laboratories.

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 “Protecting America’s
 5 Competitive Edge Through Energy Act of 2006” or the
 6 “PACE Energy Act”.

7 **SEC. 2. MATHEMATICS, SCIENCE, AND ENGINEERING EDU-**
 8 **CATION AT THE DEPARTMENT OF ENERGY.**

9 (a) ~~SCIENCE EDUCATION PROGRAMS.—Section 3164~~
 10 ~~of the Department of Energy Science Education Enhance-~~
 11 ~~ment Act (42 U.S.C. 7381a) is amended—~~

12 (1) by redesignating subsections (b) through (d)
 13 as subsections (e) through (e), respectively;

14 (2) by inserting after subsection (a) the fol-
 15 lowing:

1 “(b) ORGANIZATION OF MATHEMATICS, SCIENCE,
2 AND ENGINEERING EDUCATION PROGRAMS.—

3 “(1) DIRECTOR OF MATHEMATICS, SCIENCE
4 AND ENGINEERING EDUCATION.—The Secretary,
5 acting through the Under Secretary for Science (re-
6 ferred to in this subsection as the ‘Under Sec-
7 retary’), shall appoint a Director of Mathematics,
8 Science, and Engineering Education (referred to in
9 this subsection as the ‘Director’) with the principal
10 responsibility for administering mathematics,
11 science, and engineering education programs of the
12 Department.

13 “(2) QUALIFICATIONS.—The Director shall be
14 an individual, who by reason of professional back-
15 ground and experience, is specially qualified to ad-
16 vise the Under Secretary on all matters pertaining
17 to mathematics, science, and engineering education
18 at the Department.

19 “(3) DUTIES.—The Director shall—

20 “(A) oversee all mathematics, science, and
21 engineering education programs of the Depart-
22 ment;

23 “(B) represent the Department as the
24 principal interagency liaison for all mathe-
25 matics, science, and engineering education pro-

1 grams, unless otherwise represented by the Sec-
2 retary or the Under Secretary;

3 “(C) prepare the annual budget and advise
4 the Under Secretary on all budgetary issues for
5 mathematics, science, and engineering edu-
6 cation programs of the Department; and

7 “(D) perform other such matters related to
8 mathematics, science, and engineering edu-
9 cation as are required by the Secretary or the
10 Under Secretary.

11 “(4) STAFF AND OTHER RESOURCES.—The
12 Secretary shall assign to the Director such personnel
13 and other resources as the Secretary considers nec-
14 essary to permit the Director to carry out the duties
15 of the Director.

16 “(5) ASSESSMENT.—The Secretary shall offer
17 to enter into a contract with the National Academy
18 of Sciences under which the National Academy, not
19 later than 5 years after, and not later than 10 years
20 after, the date of enactment of this paragraph, shall
21 assess the performance of the mathematics, science,
22 and engineering education programs of the Depart-
23 ment.

1 “(6) AUTHORIZATION OF APPROPRIATIONS.—

2 There are authorized to be appropriated such sums
3 as are necessary to carry out this subsection.”; and

4 (3) by striking subsection (d) (as redesignated
5 by paragraph (1)) and inserting the following:

6 “(d) MATHEMATICS, SCIENCE, AND ENGINEERING
7 EDUCATION FUND.—The Secretary shall establish a
8 Mathematics, Science, and Engineering Education Fund,
9 using not less than 0.3 percent of the amount made avail-
10 able to the Department for research, development, dem-
11 onstration, and commercial application for each fiscal
12 year, to carry out sections 3165, 3166, and 3167.”.

13 (b) DEFINITION.—Section 3168 of the Department
14 of Energy Science Education Enhancement Act (42
15 U.S.C. 7381d) is amended by adding at the end the fol-
16 lowing:

17 “(5) NATIONAL LABORATORY.—The term ‘Na-
18 tional Laboratory’ has the meaning given the term
19 in section 2 of the Energy Policy Act of 2005 (42
20 U.S.C. 15801).”.

21 (c) MATHEMATICS, SCIENCE, AND ENGINEERING
22 EDUCATION PROGRAMS.—The Department of Energy
23 Science Education Enhancement Act (42 U.S.C. 7381 et
24 seq.) is amended—

1 (1) by inserting after section 3162 the fol-
 2 lowing:

3 **“Subpart A—Science Education Enhancement”;**

4 (2) in section 3169, by striking “part” and in-
 5 serting “subpart”; and

6 (3) by adding at the end the following:

7 **“Subpart B—Mathematics, Science, and Engineering**
 8 **Education Programs**

9 **“SEC. 3170. DEFINITIONS.**

10 “In this subpart:

11 “(1) DIRECTOR.—The term ‘Director’ means
 12 the Director of Mathematics, Science, and Engineer-
 13 ing Education.

14 “(2) NATIONAL LABORATORY.—The term ‘Na-
 15 tional Laboratory’ has the meaning given the term
 16 in section 2 of the Energy Policy Act of 2005 (42
 17 U.S.C. 15801).

18 **“CHAPTER 1—ASSISTANCE FOR SPE-**
 19 **CIALTY SCHOOLS FOR MATHEMATICS**
 20 **AND SCIENCE**

21 **“SEC. 3171. ASSISTANCE FOR SPECIALTY SCHOOLS FOR**
 22 **MATHEMATICS AND SCIENCE.**

23 “(a) IN GENERAL.—Consistent with sections 3165
 24 and 3166, the Director shall make available necessary

1 funds for a program using scientific and engineering staff
 2 of the National Laboratories, in which the staff—

3 “(1) assists teaching courses at statewide spe-
 4 cialty secondary schools that provide comprehensive
 5 mathematics and science (including engineering)
 6 education; and

7 “(2) uses National Laboratory scientific equip-
 8 ment in the teaching of the courses.

9 “(b) REPORT TO CONGRESS.—Not later than 2 years
 10 after the date of enactment of the Protecting America’s
 11 Competitive Edge Through Energy Act of 2006, the Di-
 12 rector shall submit a report to the appropriate committees
 13 of Congress detailing the impact of the activities assisted
 14 with funds made available under this section.

15 **“CHAPTER 2—EXPERIENTIAL-BASED**
 16 **LEARNING OPPORTUNITIES**

17 **“SEC. 3175. EXPERIENTIAL-BASED LEARNING OPPORTUNI-**
 18 **TIES.**

19 “(a) INTERNSHIPS AUTHORIZED.—From the
 20 amounts authorized under subsection (d), the Secretary,
 21 acting through the Director, shall establish a summer in-
 22 ternship program for middle school and secondary school
 23 students that shall—

24 “(1) provide the students with internships at
 25 the National Laboratories; and

1 ~~“(2) promote experiential, hands-on learning in~~
 2 ~~mathematics or science.~~

3 ~~“(b) ELIGIBILITY CRITERIA.—The Director shall es-~~
 4 ~~tablish criteria to determine the sufficient level of aca-~~
 5 ~~demic preparedness necessary for a student to be eligible~~
 6 ~~for an internship under this section.~~

7 ~~“(c) PRIORITY.—~~

8 ~~“(1) IN GENERAL.—The Director shall give pri-~~
 9 ~~ority for an internship under this section to a stu-~~
 10 ~~dent who meets the eligibility criteria described in~~
 11 ~~subsection (b) and who attends a school—~~

12 ~~“(A)(i) in which not less than 40 percent~~
 13 ~~of the children enrolled in the school are from~~
 14 ~~low-income families; or~~

15 ~~“(ii) that is designated with a school locale~~
 16 ~~code of 7 or 8, as determined by the Secretary~~
 17 ~~of Education; and~~

18 ~~“(B) for which there is—~~

19 ~~“(i) a high percentage of teachers who~~
 20 ~~are not teaching in the academic subject~~
 21 ~~areas or grade levels in which the teachers~~
 22 ~~were trained to teach;~~

23 ~~“(ii) a high teacher turnover rate; or~~

1 “(iii) a high percentage of teachers
2 with emergency, provisional, or temporary
3 certification or licenses.

4 “(2) COORDINATION.—The Director shall con-
5 sult with the Secretary of Education in order to de-
6 termine whether a student meets the priority re-
7 quirements of this subsection.

8 “(d) AUTHORIZATION OF APPROPRIATIONS.—There
9 is authorized to be appropriated to carry out this section
10 \$50,000,000 for each of the fiscal years 2007 through
11 2013.

12 **“CHAPTER 3—NATIONAL LABORATORIES**
13 **CENTERS OF EXCELLENCE IN MATHE-**
14 **MATICS AND SCIENCE EDUCATION**

15 **“SEC. 3181. NATIONAL LABORATORIES CENTERS OF EXCEL-**
16 **LENCE IN MATHEMATICS AND SCIENCE EDU-**
17 **CATION.**

18 “(a) IN GENERAL.—The Secretary shall establish at
19 each of the National Laboratories a program to support
20 a Center of Excellence in Mathematics and Science at 1
21 public secondary school located in the region of the Na-
22 tional Laboratory to provide assistance in accordance with
23 subsection (e).

1 “(b) GOALS.—The Secretary shall establish goals and
2 performance assessments for each Center of Excellence
3 authorized under subsection (a).

4 “(c) ASSISTANCE.—Consistent with sections 3165
5 and 3166, the Director shall make available necessary
6 funds for a program using scientific and engineering staff
7 of the National Laboratories, during which the staff—

8 “(1) assists teaching courses at the Centers of
9 Excellence in Mathematics and Science; and

10 “(2) uses National Laboratory scientific equip-
11 ment in the teaching of the courses.

12 “(d) EVALUATION.—The Secretary shall consider the
13 results of the performance assessments required under
14 subsection (b) in any performance review of a National
15 Laboratories management and operations contractor.

16 **“CHAPTER 4—SUMMER INSTITUTES**

17 **“SEC. 3185. SUMMER INSTITUTES.**

18 “(a) DEFINITION OF SUMMER INSTITUTE.—In this
19 section, the term ‘summer institute’ means an institute at
20 a National Laboratory, conducted during the summer,
21 that—

22 “(1) is conducted for a period of not less than
23 2 weeks;

1 “(c) QUALIFICATIONS.—Successful candidates under
2 this section shall be persons who, by reason of professional
3 background and experience, are able to bring international
4 recognition to the appointing National Laboratory in their
5 field of scientific endeavor.

6 “(d) SELECTION.—A distinguished scientist ap-
7 pointed under this section shall be selected through an
8 open peer review process.

9 “(e) APPOINTMENT.—An appointment by a National
10 Laboratory under this section shall be at the rank of the
11 highest grade of distinguished scientist or technical staff
12 of the National Laboratory.

13 “(f) DURATION.—An appointment under this section
14 shall be for 6 years, consisting of 2 3-year funding allot-
15 ments.

16 “(g) USE OF FUNDS.—Funds made available under
17 this section may be used for—

18 “(1) the salary of the distinguished scientist
19 and support staff;

20 “(2) undergraduate, graduate, and post-doe-
21 toral appointments;

22 “(3) research-related equipment;

23 “(4) professional travel; and

1 “(5) such other requirements as the Director
2 determines are necessary to carry out the purpose of
3 the program.

4 “(h) REVIEW.—

5 “(1) IN GENERAL.—The appointment of a dis-
6 tinguished scientist under this section shall be re-
7 viewed at the end of the first 3-year allotment for
8 the distinguished scientist through an open peer re-
9 view process to determine if the appointment is
10 meeting the purpose of this section under subsection
11 (a).

12 “(2) FUNDING.—Funding of the appointment
13 of the distinguished scientist for the second 3-year
14 allotment shall be determined based on the review
15 conducted under paragraph (1).”

16 **SEC. 3. DEPARTMENT OF ENERGY EARLY-CAREER RE-**
17 **SEARCH GRANTS.**

18 (a) PURPOSE.—It is the purpose of this section to
19 authorize research grants in the Department of Energy
20 for early-career scientists and engineers for purposes of
21 pursuing independent research.

22 (b) DEFINITION OF ELIGIBLE EARLY-CAREER RE-
23 SEARCHER.—In this section, the term “eligible early-ca-
24 reer researcher” means an individual who—

1 (1) completed a doctorate or other terminal de-
2 gree not more than 10 years before the date of en-
3 actment of this Act and has demonstrated promise
4 in the field of science, technology, engineering, or
5 mathematics; or

6 (2) has an equivalent professional qualification
7 in the field of science, technology, engineering, or
8 mathematics.

9 (c) GRANT PROGRAM AUTHORIZED.—

10 (1) IN GENERAL.—The Secretary of Energy,
11 through the Director of the Office of Science of the
12 Department of Energy, shall award not less than 65
13 grants per year to outstanding eligible early-career
14 researchers to support the work of such researchers
15 in the Department, particularly the National Lab-
16 oratories, or other federally-funded research and de-
17 velopment centers.

18 (2) APPLICATION.—An eligible early-career re-
19 searcher who desires to receive a grant under this
20 section shall submit to the Secretary of Energy an
21 application at such time, in such manner, and ac-
22 companied by such information as the Secretary may
23 require.

24 (3) SPECIAL CONSIDERATION.—In awarding
25 grants under this section, the Secretary of Energy

1 shall give special consideration to eligible early-career researchers who have followed alternative career paths such as working part-time or in non-academic settings, or who have taken a significant career break or other leave of absence.

6 (4) DURATION AND AMOUNT.—A grant under this section shall be 5 years in duration. An eligible early career-researcher who receives a grant under this section shall receive \$100,000 for each year of the grant period.

11 (5) USE OF FUNDS.—An eligible early career-researcher who receives a grant under this section shall use the grant funds for basic research in natural sciences, engineering, mathematics, or computer sciences at the Department of Energy, particularly the National Laboratories, or other federally-funded research and development center.

18 (6) AUTHORIZATION OF APPROPRIATIONS.—
19 There are authorized to be appropriated to carry out
20 this section—

21 (A) \$6,500,000 for fiscal year 2007;

22 (B) \$13,000,000 for fiscal year 2008;

23 (C) \$19,500,000 for fiscal year 2009;

24 (D) \$26,000,000 for fiscal year 2010; and

25 (E) \$32,500,000 for fiscal year 2011.

1 **SEC. 4. ADVANCED RESEARCH PROJECTS AUTHORITY-EN-**
2 **ERGY.**

3 (a) **DEFINITIONS.**—In this section:

4 (1) **ARPA-E.**—The term “ARPA-E” means
5 the Advanced Research Projects Authority—Energy
6 established under subsection (b).

7 (2) **FUND.**—The term “Fund” means the Ae-
8 celeration Fund for Research and Development of
9 Energy Technologies established under subsection
10 (c).

11 (3) **SECRETARY.**—The term “Secretary” means
12 the Secretary of Energy.

13 (4) **UNDER SECRETARY.**—The term “Under
14 Secretary” means the position of Under Secretary
15 for Science established under section 202(b) of the
16 Department of Energy Organization Act (42 U.S.C.
17 7132(b)).

18 (b) **ARPA-E.**—

19 (1) **ESTABLISHMENT.**—There is established the
20 Advanced Research Projects Authority—Energy.

21 (2) **DIRECTOR.**—ARPA-E shall be headed by a
22 Director, who shall be appointed by the Secretary
23 and report to the Under Secretary.

24 (3) **RESPONSIBILITIES.**—The Director shall use
25 the Fund to award competitive, merit-based grants,
26 cooperative agreements, and contracts to public or

1 private entities (including businesses, federally fund-
2 ed research and development centers, and institu-
3 tions of higher education) to—

4 (A) support basic and applied energy re-
5 search to promote revolutionary changes in
6 technologies that would promote the missions of
7 the Department of Energy;

8 (B) advance the development, testing, eval-
9 uation, and deployment of critical energy tech-
10 nologies; and

11 (C) accelerate prototyping and develop-
12 ment of technologies that would address na-
13 tional energy priorities.

14 (4) TARGETED COMPETITIONS.—The Director
15 may solicit proposals to address areas of national
16 need in science and energy technology, as identified
17 by the Director.

18 (5) COORDINATION.—The Director—

19 (A) shall ensure that the activities of
20 ARPA-E are coordinated with activities of
21 other appropriate research agencies; and

22 (B) may carry out projects under this sec-
23 tion jointly with other agencies.

24 (6) PERSONNEL.—

1 (A) ~~IN GENERAL.~~—In hiring personnel for
2 ~~ARPA-E~~, the Secretary shall have the hiring
3 and management authorities described in sec-
4 tion 1101 of the Strom Thurmond National De-
5 fense Authorization Act for Fiscal Year 1999
6 (Public Law 105-261; 5 U.S.C. 3104 note).

7 (B) ~~TERM.~~—The term of appointments for
8 an employee under subparagraph (A) may not
9 exceed 5 years, except that the Secretary may
10 renew the term of appointment of the employee
11 for an additional term of 5 years.

12 (7) ~~DEMONSTRATIONS.~~—The Director shall pe-
13 riodically hold energy technology demonstrations to
14 improve contact among technology developers, ven-
15 dors, and acquisition personnel.

16 (c) ~~FUND.~~—

17 (1) ~~ESTABLISHMENT.~~—There is established in
18 the Treasury of the United States a revolving fund,
19 to be known as the “Acceleration Fund for Research
20 and Development of Energy Technologies”, con-
21 sisting of—

22 (A) such amounts as are appropriated to
23 the Fund under paragraph (5); and

24 (B) any interest earned on investment of
25 amounts in the Fund under paragraph (3).

1 (2) EXPENDITURES FROM FUND.—

2 (A) IN GENERAL.—Subject to subpara-
3 graph (B), on request by the Director, the Sec-
4 retary of the Treasury shall transfer from the
5 Fund to the Director such amounts as the Di-
6 rector determines are necessary to carry out
7 this section.

8 (B) ADMINISTRATIVE EXPENSES.—An
9 amount not exceeding 5 percent of the amounts
10 in the Fund shall be available for each fiscal
11 year to pay the administrative expenses nec-
12 essary to carry out this section.

13 (3) INVESTMENT OF AMOUNTS.—

14 (A) IN GENERAL.—The Secretary of the
15 Treasury shall invest such portion of the Fund
16 as is not, in the judgment of the Secretary of
17 the Treasury, required to meet current with-
18 drawals.

19 (B) INTEREST-BEARING OBLIGATIONS.—
20 Investments may be made only in interest-bear-
21 ing obligations of the United States.

22 (C) ACQUISITION OF OBLIGATIONS.—For
23 the purpose of investments under subparagraph
24 (A), obligations may be acquired—

1 (i) on original issue at the issue price;

2 or

3 (ii) by purchase of outstanding obliga-
4 tions at the market price.

5 (D) SALE OF OBLIGATIONS.—Any obliga-
6 tion acquired by the Fund may be sold by the
7 Secretary of the Treasury at the market price.

8 (E) CREDITS TO FUND.—The interest on,
9 and the proceeds from the sale or redemption
10 of, any obligations held in the Fund shall be
11 credited to, and form a part of, the Fund.

12 (4) TRANSFERS OF AMOUNTS.—

13 (A) IN GENERAL.—The amounts required
14 to be transferred to the Fund under this sub-
15 section shall be transferred at least monthly
16 from the general fund of the Treasury to the
17 Fund on the basis of estimates made by the
18 Secretary of the Treasury.

19 (B) ADJUSTMENTS.—Proper adjustment
20 shall be made in amounts subsequently trans-
21 ferred to the extent prior estimates were in ex-
22 cess of or less than the amounts required to be
23 transferred.

1 (5) AUTHORIZATION OF APPROPRIATIONS.—

2 There are authorized to be appropriated to the
3 Fund—

4 (A) \$300,000,000 for fiscal year 2007;

5 (B) \$500,000,000 for fiscal year 2008;

6 (C) \$700,000,000 for fiscal year 2009;

7 (D) \$900,000,000 for fiscal year 2010;

8 and

9 (E) \$1,000,000,000 for fiscal year 2011.

10 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS FOR THE DE-**

11 **PARTMENT OF ENERGY FOR BASIC RE-**

12 **SEARCH.**

13 Section 971(b) of the Energy Policy Act of 2005 (42
14 U.S.C. 16311(b)) is amended—

15 (1) in paragraph (2), by striking “and” at the
16 end;

17 (2) in paragraph (3), by striking the period at
18 the end and inserting a semicolon; and

19 (3) by adding at the end the following:

20 “(4) \$5,320,000,000 for fiscal year 2010;

21 “(5) \$5,851,000,000 for fiscal year 2011;

22 “(6) \$6,436,000,000 for fiscal year 2012; and

23 “(7) \$7,080,000,000 for fiscal year 2013.”.

1 **SECTION 1. SHORT TITLE.**

2 *This Act may be cited as the “Protecting America’s*
 3 *Competitive Edge Through Energy Act of 2006” or the*
 4 *“PACE–Energy Act”.*

5 **SEC. 2. DEFINITIONS.**

6 *In this Act:*

7 (1) *DEPARTMENT.*—*The term “Department”*
 8 *means the Department of Energy.*

9 (2) *INSTITUTION OF HIGHER EDUCATION.*—*The*
 10 *term “institution of higher education” has the mean-*
 11 *ing given the term in section 2 of the Energy Policy*
 12 *Act of 2005 (42 U.S.C. 15801).*

13 (3) *NATIONAL LABORATORY.*—*The term “Na-*
 14 *tional Laboratory” has the meaning given the term in*
 15 *section 2 of the Energy Policy Act of 2005 (42 U.S.C.*
 16 *15801).*

17 (4) *SECRETARY.*—*The term “Secretary” means*
 18 *the Secretary of Energy, acting through the Under*
 19 *Secretary for Science appointed under section 202(b)*
 20 *of the Department of Energy Organization Act (42*
 21 *U.S.C. 7132(b)).*

22 **SEC. 3. MATHEMATICS, SCIENCE, AND ENGINEERING EDU-**
 23 **CATION AT THE DEPARTMENT OF ENERGY.**

24 (a) *SCIENCE EDUCATION PROGRAMS.*—*Section 3164 of*
 25 *the Department of Energy Science Education Enhancement*
 26 *Act (42 U.S.C. 7381a) is amended—*

1 (1) *by redesignating subsections (b) through (d)*
2 *as subsections (c) through (e), respectively;*

3 (2) *by inserting after subsection (a) the fol-*
4 *lowing:*

5 “(b) *ORGANIZATION OF MATHEMATICS, SCIENCE, AND*
6 *ENGINEERING EDUCATION PROGRAMS.—*

7 “(1) *DIRECTOR OF MATHEMATICS, SCIENCE AND*
8 *ENGINEERING EDUCATION.—The Secretary, acting*
9 *through the Under Secretary for Science (referred to*
10 *in this subsection as the ‘Under Secretary’), shall ap-*
11 *point a Director of Mathematics, Science, and Engi-*
12 *neering Education (referred to in this subsection as*
13 *the ‘Director’) with the principal responsibility for*
14 *administering mathematics, science, and engineering*
15 *education programs of the Department.*

16 “(2) *QUALIFICATIONS.—The Director shall be an*
17 *individual, who by reason of professional background*
18 *and experience, is specially qualified to advise the*
19 *Under Secretary on all matters pertaining to mathe-*
20 *matics, science, and engineering education at the De-*
21 *partment.*

22 “(3) *DUTIES.—The Director shall—*

23 “(A) *oversee all mathematics, science, and*
24 *engineering education programs of the Depart-*
25 *ment;*

1 “(B) represent the Department as the prin-
2 cipal interagency liaison for all mathematics,
3 science, and engineering education programs,
4 unless otherwise represented by the Secretary or
5 the Under Secretary;

6 “(C) prepare the annual budget and advise
7 the Under Secretary on all budgetary issues for
8 mathematics, science, and engineering education
9 programs of the Department;

10 “(D) increase, to the maximum extent prac-
11 ticable, the participation and advancement of
12 women and underrepresented minorities at every
13 level of science, technology, engineering, and
14 mathematics education; and

15 “(E) perform other such matters related to
16 mathematics, science, and engineering education
17 as are required by the Secretary or the Under
18 Secretary.

19 “(4) STAFF AND OTHER RESOURCES.—The Sec-
20 retary shall assign to the Director such personnel and
21 other resources as the Secretary considers necessary to
22 permit the Director to carry out the duties of the Di-
23 rector.

24 “(5) ASSESSMENT.—The Secretary shall offer to
25 enter into a contract with the National Academy of

1 *Sciences under which the National Academy, not later*
2 *than 5 years after, and not later than 10 years after,*
3 *the date of enactment of this paragraph, shall assess*
4 *the performance of the mathematics, science, and en-*
5 *gineering education programs of the Department.*

6 “(6) *AUTHORIZATION OF APPROPRIATIONS.—*
7 *There are authorized to be appropriated such sums as*
8 *are necessary to carry out this subsection.”; and*

9 *(3) by striking subsection (d) (as redesignated by*
10 *paragraph (1)) and inserting the following:*

11 “(d) *MATHEMATICS, SCIENCE, AND ENGINEERING*
12 *EDUCATION FUND.—The Secretary shall establish a Mathe-*
13 *matics, Science, and Engineering Education Fund, using*
14 *not less than 0.3 percent of the amount made available to*
15 *the Department for research, development, demonstration,*
16 *and commercial application for each fiscal year, to carry*
17 *out sections 3165, 3166, and 3167.”.*

18 “(b) *DEFINITION.—Section 3168 of the Department of*
19 *Energy Science Education Enhancement Act (42 U.S.C.*
20 *7381d) is amended by adding at the end the following:*

21 “(5) *NATIONAL LABORATORY.—The term ‘Na-*
22 *tional Laboratory’ has the meaning given the term in*
23 *section 2 of the Energy Policy Act of 2005 (42 U.S.C.*
24 *15801).”.*

1 **“CHAPTER 1—ASSISTANCE FOR SPE-**
2 **cialty Schools for Mathematics**
3 **AND SCIENCE**

4 **“SEC. 3171. ASSISTANCE FOR SPECIALTY SCHOOLS FOR**
5 **MATHEMATICS AND SCIENCE.**

6 *“(a) IN GENERAL.—Consistent with sections 3165 and*
7 *3166, the Director shall make available necessary funds for*
8 *a program using scientific and engineering staff of the Na-*
9 *tional Laboratories, in which the staff—*

10 *“(1) assists teaching courses at statewide spe-*
11 *cialty secondary schools that provide comprehensive*
12 *mathematics and science (including engineering) edu-*
13 *cation; and*

14 *“(2) uses National Laboratory scientific equip-*
15 *ment in the teaching of the courses.*

16 *“(b) REPORT TO CONGRESS.—Not later than 2 years*
17 *after the date of enactment of the Protecting America’s*
18 *Competitive Edge Through Energy Act of 2006, the Director*
19 *shall submit a report to the appropriate committees of Con-*
20 *gress detailing the impact of the activities assisted with*
21 *funds made available under this section.*

1 **“CHAPTER 2—EXPERIENTIAL-BASED**
2 **LEARNING OPPORTUNITIES**

3 **“SEC. 3175. EXPERIENTIAL-BASED LEARNING OPPORTUNI-**
4 **TIES.**

5 “(a) *INTERNSHIPS AUTHORIZED.*—*From the amounts*
6 *authorized under subsection (e), the Secretary, acting*
7 *through the Director, shall establish a summer internship*
8 *program for middle school and secondary school students*
9 *that shall—*

10 “(1) *provide the students with internships at the*
11 *National Laboratories; and*

12 “(2) *promote experiential, hands-on learning in*
13 *mathematics or science.*

14 “(b) *ELIGIBILITY CRITERIA.*—*The Director shall es-*
15 *tablish criteria to determine the sufficient level of academic*
16 *preparedness necessary for a student to be eligible for an*
17 *internship under this section.*

18 “(c) *PRIORITY.*—

19 “(1) *IN GENERAL.*—*The Director shall give pri-*
20 *ority for an internship under this section to a student*
21 *who meets the eligibility criteria described in sub-*
22 *section (b) and who attends a school—*

23 “(A)(i) *in which not less than 30 percent of*
24 *the children enrolled in the school are from low-*
25 *income families; or*

1 “(i) that is designated with a school locale
2 code of 7 or 8 or otherwise designated as a rural
3 school, as determined by the Secretary of Edu-
4 cation; and

5 “(B) for which there is—

6 “(i) a high percentage of teachers who
7 are not teaching in the academic subject
8 areas or grade levels in which the teachers
9 were trained to teach;

10 “(ii) a high teacher turnover rate; or

11 “(iii) a high percentage of teachers
12 with emergency, provisional, or temporary
13 certification or licenses.

14 “(2) COORDINATION.—The Director shall consult
15 with the Secretary of Education in order to determine
16 whether a student meets the priority requirements of
17 this subsection.

18 “(d) OUTREACH AND EXPERIENTIAL-BASED PRO-
19 GRAMS FOR MINORITY STUDENTS.—

20 “(1) IN GENERAL.—The Secretary, acting
21 through the Director, in cooperation with Hispanic-
22 serving institutions, historically Black colleges and
23 universities, tribal colleges, and other minority-serv-
24 ing institutions and nonprofit entities with substan-
25 tial experience relating to outreach and experiential-

1 *based learning projects, shall establish outreach and*
2 *experiential-based learning programs that will en-*
3 *courage underrepresented minority students in kin-*
4 *dergarten through grade 12 to pursue careers in*
5 *math, science, and engineering.*

6 “(2) *COMMUNITY INVOLVEMENT.*—*The Secretary*
7 *shall ensure that the programs established under*
8 *paragraph (1) involve, to the maximum extent prac-*
9 *ticable—*

10 “(A) *participation by parents and edu-*
11 *cators; and*

12 “(B) *the establishment of partnerships with*
13 *business organizations and appropriate Federal,*
14 *State, and local agencies.*

15 “(3) *DISTRIBUTION.*—*The Secretary shall ensure*
16 *that the programs established under paragraph (1)*
17 *are located in various geographic regions of the*
18 *United States, to the maximum extent practicable.*

19 “(e) *AUTHORIZATION OF APPROPRIATIONS.*—*There is*
20 *authorized to be appropriated to carry out this section*
21 *\$50,000,000 for each of the fiscal years 2007 through 2013.*

1 **“CHAPTER 3—NATIONAL LABORATORIES**
2 **CENTERS OF EXCELLENCE IN MATHE-**
3 **MATICS AND SCIENCE EDUCATION**

4 **“SEC. 3181. NATIONAL LABORATORIES CENTERS OF EXCEL-**
5 **LENCE IN MATHEMATICS AND SCIENCE EDU-**
6 **CATION.**

7 *“(a) IN GENERAL.—The Secretary shall establish at*
8 *each of the National Laboratories a program to support a*
9 *Center of Excellence in Mathematics and Science at 1 pub-*
10 *lic secondary school located in the region of the National*
11 *Laboratory to provide assistance in accordance with sub-*
12 *section (c).*

13 *“(b) GOALS.—The Secretary shall establish goals and*
14 *performance assessments for each Center of Excellence au-*
15 *thorized under subsection (a).*

16 *“(c) ASSISTANCE.—Consistent with sections 3165 and*
17 *3166, the Director shall make available necessary funds for*
18 *a program using scientific and engineering staff of the Na-*
19 *tional Laboratories, during which the staff—*

20 *“(1) assists teaching courses at the Centers of*
21 *Excellence in Mathematics and Science; and*

22 *“(2) uses National Laboratory scientific equip-*
23 *ment in the teaching of the courses.*

24 *“(d) EVALUATION.—The Secretary shall consider the*
25 *results of the performance assessments required under sub-*

1 *section (b) in any performance review of a National Lab-*
 2 *oratories management and operations contractor.*

3 **“CHAPTER 4—SUMMER INSTITUTES**

4 **“SEC. 3185. SUMMER INSTITUTES.**

5 “(a) *DEFINITION OF SUMMER INSTITUTE.*—*In this*
 6 *section, the term ‘summer institute’ means an institute at*
 7 *a National Laboratory, conducted during the summer,*
 8 *that—*

9 “(1) *is conducted for a period of not less than 2*
 10 *weeks;*

11 “(2) *includes, as a component, a program that*
 12 *provides direct interaction between students and fac-*
 13 *ulty; and*

14 “(3) *provides for follow-up training during the*
 15 *academic year.*

16 “(b) *SUMMER INSTITUTE PROGRAMS AUTHORIZED.*—
 17 *The Secretary, acting through the Director, shall establish*
 18 *or expand program of summer institutes at each of the Na-*
 19 *tional Laboratories to provide additional training to*
 20 *strengthen the mathematics and science teaching skills of*
 21 *teachers employed at public schools in kindergarten through*
 22 *grade 12 education, with a particular focus on teachers of*
 23 *kindergarten through grade 8.*

1 **“CHAPTER 5—DISTINGUISHED SCIENTIST**
2 **PROGRAM**

3 **“SEC. 3191. DISTINGUISHED SCIENTIST PROGRAM.**

4 “(a) *PURPOSE.*—*The purpose of this section is to pro-*
5 *mote scientific and academic excellence at National Labora-*
6 *tories.*

7 “(b) *ESTABLISHMENT.*—*The Secretary, acting through*
8 *the Director and in consultation with the Director of the*
9 *Office of Science, shall establish a program to support the*
10 *appointment of distinguished scientists by National Lab-*
11 *oratories.*

12 “(c) *QUALIFICATIONS.*—*Successful candidates under*
13 *this section shall be persons who, by reason of professional*
14 *background and experience, are able to bring international*
15 *recognition to the appointing National Laboratory in their*
16 *field of scientific endeavor.*

17 “(d) *SELECTION.*—*A distinguished scientist appointed*
18 *under this section shall be selected through an open peer*
19 *review process.*

20 “(e) *APPOINTMENT.*—*An appointment by a National*
21 *Laboratory under this section shall be at the rank of the*
22 *highest grade of distinguished scientist or technical staff of*
23 *the National Laboratory.*

1 “(f) *DURATION.*—*An appointment under this section*
2 *shall be for 6 years, consisting of 2 3-year funding allot-*
3 *ments.*

4 “(g) *USE OF FUNDS.*—*Funds made available under*
5 *this section may be used for—*

6 “(1) *the salary of the distinguished scientist and*
7 *support staff;*

8 “(2) *undergraduate, graduate, and post-doctoral*
9 *appointments;*

10 “(3) *research-related equipment;*

11 “(4) *professional travel; and*

12 “(5) *such other requirements as the Director de-*
13 *termines are necessary to carry out the purpose of the*
14 *program.*

15 “(h) *REVIEW.*—

16 “(1) *IN GENERAL.*—*The appointment of a distin-*
17 *guished scientist under this section shall be reviewed*
18 *at the end of the first 3-year allotment for the distin-*
19 *guished scientist through an open peer review process*
20 *to determine if the appointment is meeting the pur-*
21 *pose of this section under subsection (a).*

22 “(2) *FUNDING.*—*Funding of the appointment of*
23 *the distinguished scientist for the second 3-year allot-*
24 *ment shall be determined based on the review con-*
25 *ducted under paragraph (1).*

1 **“CHAPTER 6—NUCLEAR SCIENCE**
2 **EDUCATION**

3 **“SEC. 3195. NUCLEAR SCIENCE TALENT EXPANSION PRO-**
4 **GRAM FOR INSTITUTIONS OF HIGHER EDU-**
5 **CATION.**

6 “(a) *PURPOSES.*—*The purposes of this section are—*

7 “(1) *to address the decline in the number of and*
8 *resources available to nuclear science programs of in-*
9 *stitutions of higher education; and*

10 “(2) *to increase the number of graduates with*
11 *degrees in nuclear science, an area of strategic impor-*
12 *tance to the economic competitiveness and energy se-*
13 *curity of the United States.*

14 “(b) *DEFINITION OF NUCLEAR SCIENCE.*—*In this sec-*
15 *tion, the term ‘nuclear science’ includes—*

16 “(1) *nuclear science;*

17 “(2) *nuclear engineering;*

18 “(3) *nuclear chemistry;*

19 “(4) *radiochemistry; and*

20 “(5) *health physics.*

21 “(c) *ESTABLISHMENT.*—*The Secretary, acting through*
22 *the Director, shall establish in accordance with this section*
23 *a program to expand and enhance institution of higher edu-*
24 *cation nuclear science educational capabilities.*

1 “(d) *NUCLEAR SCIENCE PROGRAM EXPANSION*
2 *GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.*—

3 “(1) *IN GENERAL.*—*The Secretary, acting*
4 *through the Director, shall award up to 3 competitive*
5 *grants for each fiscal year to institutions of higher*
6 *education that establish new academic degree pro-*
7 *grams in nuclear science.*

8 “(2) *ELIGIBILITY.*—*To be eligible for a grant*
9 *under this subsection, an applicant shall partner with*
10 *a National Laboratory or other eligible nuclear enti-*
11 *ty, as determined by the Secretary.*

12 “(3) *CRITERIA.*—*Criteria for a grant awarded*
13 *under this subsection shall be based on—*

14 “(A) *the potential to attract new students to*
15 *the program;*

16 “(B) *academic rigor; and*

17 “(C) *the ability to offer hands-on learning*
18 *opportunities.*

19 “(4) *DURATION AND AMOUNT.*—

20 “(A) *DURATION.*—*A grant under this sub-*
21 *section shall be 5 years in duration.*

22 “(B) *AMOUNT.*—*An institution of higher*
23 *education that receives a grant under this sub-*
24 *section shall be eligible for up to \$500,000 for*
25 *each year of the grant period.*

1 “(5) *USE OF FUNDS.*—*An institution of higher*
2 *education that receives a grant under this subsection*
3 *may use the grant to—*

4 “(A) *recruit and retain new faculty;*

5 “(B) *develop core and specialized course*
6 *content;*

7 “(C) *encourage collaboration between fac-*
8 *ulty and researchers in the nuclear science field;*

9 *or*

10 “(D) *support outreach efforts to recruit stu-*
11 *dents.*

12 “(e) *NUCLEAR SCIENCE COMPETITIVENESS GRANTS*
13 *FOR INSTITUTIONS OF HIGHER EDUCATION.*—

14 “(1) *IN GENERAL.*—*The Secretary, acting*
15 *through the Director shall award up to 10 competitive*
16 *grants for each fiscal year to institutions of higher*
17 *education with existing academic degree programs*
18 *that produce graduates in nuclear science.*

19 “(2) *CRITERIA.*—*Criteria for a grant awarded*
20 *under this subsection shall be based on the potential*
21 *for increasing the number and academic quality of*
22 *graduates in the nuclear sciences that enter into ca-*
23 *reers in nuclear-related fields.*

24 “(3) *DURATION AND AMOUNT.*—

1 “(A) *DURATION.*—*A grant under this sub-*
2 *section shall be 5 years in duration.*

3 “(B) *AMOUNT.*—*An institution of higher*
4 *education that receives a grant under this sub-*
5 *section shall be eligible for up to \$250,000 for*
6 *each year of the grant period.*

7 “(4) *USE OF FUNDS.*—*An institution of higher*
8 *education that receives a grant under this subsection*
9 *may use the grant to—*

10 “(A) *increase the number of graduates in*
11 *nuclear science that enter into careers in the nu-*
12 *clear science field;*

13 “(B) *enhance the teaching of advanced nu-*
14 *clear technologies;*

15 “(C) *aggressively pursue collaboration op-*
16 *portunities with industry and National Labora-*
17 *tories; and*

18 “(D) *bolster or sustain nuclear infrastruc-*
19 *ture and research facilities of the institution of*
20 *higher education, such as research and training*
21 *reactors or laboratories.*

22 “(f) *NUCLEAR SCIENCE TALENT EXPANSION SCHOL-*
23 *ARSHIPS.*—

24 “(1) *IN GENERAL.*—*The Secretary, acting*
25 *through the Director, shall award up to 150 competi-*

1 *tive scholarships for each fiscal year to be used to pro-*
2 *vide for educational expenses for students at eligible*
3 *institutions of higher education who enter into aca-*
4 *ademic degree programs in nuclear science.*

5 “(2) *CRITERIA.*—*Scholarships under this sub-*
6 *section shall be awarded competitively based on aca-*
7 *ademic merit.*

8 “(3) *DURATION AND AMOUNT.*—

9 “(A) *DURATION.*—*Scholarship assistance*
10 *under this subsection may be awarded for up to*
11 *4 years.*

12 “(B) *AMOUNT.*—*A student who receives a*
13 *grant under this subsection shall be eligible for*
14 *up to \$40,000 for each year of the scholarship*
15 *period to be used for educational expenses (in-*
16 *cluding tuition, books, fees, equipment, room,*
17 *and board).*

18 “(4) *TERMINATION.*—*A student who receives a*
19 *scholarship under this subsection but fails to main-*
20 *tain appropriate academic achievement for a year, as*
21 *determined by the Director, shall not be eligible for a*
22 *scholarship under this subsection for subsequent years.*

23 “(5) *INTERNSHIP.*—*The Secretary shall ensure*
24 *that each student who receives a scholarship under*
25 *this subsection has the opportunity to participate in*

1 *an internship at a National Laboratory during the*
2 *course of study of the student.*

3 “(g) *AUTHORIZATION OF APPROPRIATIONS.—*

4 “(1) *NUCLEAR SCIENCE PROGRAM EXPANSION*
5 *GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—*

6 *There are authorized to be appropriated to carry out*
7 *subsection (d)—*

8 “(A) *\$1,500,000 for fiscal year 2007;*

9 “(B) *\$3,000,000 for fiscal year 2008;*

10 “(C) *\$4,500,000 for fiscal year 2009;*

11 “(D) *\$6,000,000 for fiscal year 2010; and*

12 “(E) *\$7,500,000 for fiscal year 2011.*

13 “(2) *NUCLEAR SCIENCE COMPETITIVENESS*
14 *GRANTS FOR INSTITUTIONS OF HIGHER EDUCATION.—*

15 *There are authorized to be appropriated to carry out*
16 *subsection (e)—*

17 “(A) *\$2,500,000 for fiscal year 2007;*

18 “(B) *\$5,000,000 for fiscal year 2008;*

19 “(C) *\$7,500,000 for fiscal year 2009;*

20 “(D) *\$10,000,000 for fiscal year 2010; and*

21 “(E) *\$12,500,000 for fiscal year 2011.*

22 “(3) *NUCLEAR SCIENCE TALENT EXPANSION*
23 *SCHOLARSHIPS.—There are authorized to be appro-*

24 *riated to carry out subsection (f)—*

25 “(A) *\$6,000,000 for fiscal year 2007;*

- 1 “(B) \$12,000,000 for fiscal year 2008;
2 “(C) \$18,000,000 for fiscal year 2009;
3 “(D) \$24,000,000 for fiscal year 2010; and
4 “(E) \$30, 000,000 for fiscal year 2011.”.

5 **SEC. 4. DEPARTMENT OF ENERGY EARLY-CAREER RE-**
6 **SEARCH GRANTS.**

7 (a) *PURPOSE.*—It is the purpose of this section to au-
8 thorize research grants in the Department for early-career
9 scientists and engineers for purposes of pursuing inde-
10 pendent research.

11 (b) *DEFINITION OF ELIGIBLE EARLY-CAREER RE-*
12 *SEARCHER.*—In this section, the term “eligible early-career
13 researcher” means an individual who—

14 (1) *completed a doctorate or other terminal de-*
15 *gree not more than 10 years before the date of appli-*
16 *cation for a grant authorized under this section; and*

17 (2) *has demonstrated promise in the field of*
18 *science, technology, engineering, mathematics, com-*
19 *puter science, or computational science.*

20 (c) *GRANT PROGRAM AUTHORIZED.*—

21 (1) *IN GENERAL.*—The Secretary shall award
22 not less than 65 grants per year to outstanding eligi-
23 ble early-career researchers to support the work of
24 such researchers in the Department, particularly the

1 *National Laboratories, or other federally-funded re-*
2 *search and development centers.*

3 (2) *APPLICATION.*—*An eligible early-career re-*
4 *searcher who desires to receive a grant under this sec-*
5 *tion shall submit to the Secretary an application at*
6 *such time, in such manner, and accompanied by such*
7 *information as the Secretary may require.*

8 (3) *SPECIAL CONSIDERATION.*—*In awarding*
9 *grants under this section, the Secretary shall give spe-*
10 *cial consideration to eligible early-career researchers*
11 *who have followed alternative career paths such as*
12 *working part-time or in non-academic settings, or*
13 *who have taken a significant career break or other*
14 *leave of absence.*

15 (4) *DURATION AND AMOUNT.*—*A grant under*
16 *this section shall be 5 years in duration. An eligible*
17 *early career-researcher who receives a grant under*
18 *this section shall receive \$100,000 for each year of the*
19 *grant period.*

20 (5) *USE OF FUNDS.*—*An eligible early career-re-*
21 *searcher who receives a grant under this section shall*
22 *use the grant funds for basic research in natural*
23 *sciences, engineering, mathematics, or computer*
24 *sciences at the Department, particularly the National*

1 *Laboratories, or other federally-funded research and*
 2 *development center.*

3 (6) *AUTHORIZATION OF APPROPRIATIONS.—*

4 *There are authorized to be appropriated to carry out*
 5 *this section—*

6 (A) *\$6,500,000 for fiscal year 2007;*

7 (B) *\$13,000,000 for fiscal year 2008;*

8 (C) *\$19,500,000 for fiscal year 2009;*

9 (D) *\$26,000,000 for fiscal year 2010; and*

10 (E) *\$32,500,000 for fiscal year 2011.*

11 **SEC. 5. ADVANCED RESEARCH PROJECTS AUTHORITY-EN-**

12 **ERGY.**

13 (a) *DEFINITIONS.—In this section:*

14 (1) *ADVISORY BOARD.—The term “Advisory*
 15 *Board” means the Advisory Board established under*
 16 *subsection (d).*

17 (2) *APPLIED ENERGY TECHNOLOGY.—The term*
 18 *“applied technology” means technology used for—*

19 (A) *fossil energy;*

20 (B) *carbon sequestration;*

21 (C) *nuclear energy;*

22 (D) *renewable energy;*

23 (E) *energy distribution; or*

24 (F) *energy efficiency technology.*

1 (3) *AUTHORITY.*—The term “Authority” means
2 the Advanced Research Projects Authority—Energy
3 established under subsection (b).

4 (4) *DIRECTOR.*—The term “Director” means the
5 Director of the Authority appointed under subsection
6 (c)(1).

7 (b) *ESTABLISHMENT.*—The Secretary shall establish
8 an Advanced Research Projects Authority-Energy to over-
9 come the long-term and high-risk technological barriers in
10 the development of applied energy technologies (including
11 carbon neutral technologies) that hinder the successful im-
12 plementation of the technologies in commercial markets.

13 (c) *DIRECTOR.*—

14 (1) *APPOINTMENT.*—The Secretary shall appoint
15 a Director of the Authority.

16 (2) *QUALIFICATIONS.*—The Director shall be an
17 individual who, by reason of professional background
18 and experience, is especially qualified to advise the
19 Secretary on matters pertaining to long-term, high-
20 risk programs to overcome long-term and high-risk
21 technological barriers to the development of applied
22 energy technologies in commercial markets.

23 (3) *DUTIES.*—The Director shall—

24 (A) employ such qualified technical staff as
25 are necessary to carry out the duties of the Au-

1 *thority, including providing staff for the Advi-*
2 *sory Committee;*

3 *(B) serve as the selection official for pro-*
4 *posals relating to applied energy technologies*
5 *that are solicited within the Department;*

6 *(C) terminate programs carried out under*
7 *this section that are not achieving the goals of*
8 *the programs; and*

9 *(D) perform such duties related to long-term*
10 *and high-risk technological barriers in the devel-*
11 *opment of applied energy technologies as are de-*
12 *termined appropriate by the Secretary.*

13 *(d) ADVISORY BOARD.—*

14 *(1) APPOINTMENT.—The Secretary shall, con-*
15 *sistent with the Federal Advisory Committee Act (5*
16 *U.S.C. App.), establish, and appoint members to, an*
17 *Advisory Board to make recommendations to the Sec-*
18 *retary and the Director on actions necessary to carry*
19 *out this section.*

20 *(2) QUALIFICATIONS.—The Advisory Board shall*
21 *consist of individuals who—*

22 *(A) by reason of professional background*
23 *and experience, are especially qualified to advise*
24 *the Secretary and the Director on matters per-*
25 *taining to long-term and high-risk technological*

1 *barriers in the development of applied energy*
2 *technologies in commercial markets; and*

3 *(B) are not employees or former employees*
4 *of the Federal Government.*

5 (3) *TERM.*—*A member of the Advisory Board*
6 *shall be appointed for a term of 5 years.*

7 (4) *INFORMATION.*—*Each fiscal year, individuals*
8 *who carry out applied energy technology programs of*
9 *the Department and staff of the Authority shall pro-*
10 *vide to the Advisory Board written proposals and*
11 *oral briefings on long-term and high-risk techno-*
12 *logical barriers that are critical to overcome for the*
13 *successful development of applied energy technologies*
14 *in commercial markets.*

15 (5) *DUTIES.*—*Each fiscal year, the Advisory*
16 *Board shall—*

17 *(A) recommend to the Secretary and the Di-*
18 *rector—*

19 *(i) in order of priority, proposals of*
20 *applied energy programs of the Department*
21 *that are critical to overcoming long-term*
22 *and high-risk technological barriers to en-*
23 *able the successful development of applied*
24 *energy technologies in commercial markets;*
25 *and*

1 (ii) additional programs not covered in
2 the proposals that are critical to overcoming
3 the barriers described in clause (i); and

4 (B) make recommendations to the Secretary
5 and the Directory concerning whether programs
6 funded under this section are achieving the goals
7 of the programs.

8 (e) *REVIEW.*—Not later than 3 and 6 years after the
9 date of enactment of this Act, the Secretary shall enter into
10 an agreement with the National Academy of Sciences under
11 which the Academy shall—

12 (1) conduct a review to determine whether the
13 activities carried out under this section are over-
14 coming long-term and high risk technological barriers
15 to the successful implementation of applied energy
16 technologies in commercial markets; and

17 (2) submit to Congress, the Secretary, and the
18 Director a report describing the results of the review.

19 (f) *AUTHORIZATION OF APPROPRIATIONS.*—There is
20 authorized to be appropriated to carry out this section
21 \$250,000,000 for each of fiscal years 2007 through 2011.

1 **SEC. 6. AUTHORIZATION OF APPROPRIATIONS FOR THE DE-**
2 **PARTMENT OF ENERGY FOR BASIC RE-**
3 **SEARCH.**

4 *Section 971(b) of the Energy Policy Act of 2005 (42*
5 *U.S.C. 16311(b)) is amended—*

6 *(1) in paragraph (2), by striking “and” at the*
7 *end;*

8 *(2) in paragraph (3), by striking the period at*
9 *the end and inserting a semicolon; and*

10 *(3) by adding at the end the following:*

11 *“(4) \$5,320,000,000 for fiscal year 2010;*

12 *“(5) \$5,851,000,000 for fiscal year 2011;*

13 *“(6) \$6,436,000,000 for fiscal year 2012; and*

14 *“(7) \$7,080,000,000 for fiscal year 2013.”.*

15 **SEC. 7. DISCOVERY SCIENCE AND ENGINEERING INNOVA-**
16 **TION INSTITUTES.**

17 *(a) IN GENERAL.—The Secretary shall establish dis-*
18 *tributed, multidisciplinary institutes (referred to in this*
19 *section as “Institutes”) centered at National Laboratories*
20 *to apply fundamental science and engineering discoveries*
21 *to technological innovations for the creation of products,*
22 *processes, and services related to the missions of the Depart-*
23 *ment and the global competitiveness of the United States.*

24 *(b) TOPICAL AREAS.—The Institutes shall support sci-*
25 *entific and engineering research and education activities on*
26 *critical emerging technologies determined by the Secretary*

1 *to be essential to global competitiveness, including activities*
2 *related to—*

3 (1) *sustainable energy technologies;*

4 (2) *multi-scale materials and processes;*

5 (3) *micro- and nano-engineering;*

6 (4) *computational and information engineering;*

7 *and*

8 (5) *genomics and proteomics.*

9 (c) *PARTNERSHIPS.—In carrying out this section, the*
10 *Secretary shall establish partnerships between the Institutes*
11 *and—*

12 (1) *institutions of higher education to—*

13 (A) *train undergraduate and graduate engi-*
14 *neering and science students;*

15 (B) *develop innovative educational cur-*
16 *ricula; and*

17 (C) *conduct research within the topical*
18 *areas described in subsection (b);*

19 (2) *private industry to develop innovative tech-*
20 *nologies within the topical areas described in sub-*
21 *section (b);*

22 (3) *State and local governments to promote re-*
23 *gionally-based commercialization and entrepreneur-*
24 *ship; and*

1 (4) *financing entities to guide successful tech-*
2 *nology commercialization.*

3 (d) *MERIT-BASED SELECTION.*—*The selection of Insti-*
4 *tutes under this section shall be based on merit.*

5 (e) *REVIEW.*—*Not later than 3 and 6 years after the*
6 *date of enactment of this Act, the Secretary shall enter into*
7 *an agreement with the National Academy of Sciences under*
8 *which the Academy shall—*

9 (1) *conduct a review of the performance of the*
10 *Institutes under this section; and*

11 (2) *submit to Congress and the Secretary a re-*
12 *port describing the results of the review.*

13 (f) *AUTHORIZATION OF APPROPRIATIONS.*—*There is*
14 *authorized to be appropriated to carry out the activities of*
15 *each Institute selected under this section \$50,000,000 for*
16 *each of fiscal years 2007 through 2013.*

17 **SEC. 8. PROTECTING AMERICA'S COMPETITIVE EDGE**
18 **(PACE) GRADUATE FELLOWSHIP PROGRAM.**

19 (a) *DEFINITION OF ELIGIBLE STUDENT.*—*In this sec-*
20 *tion, the term “eligible student” means a student who at-*
21 *tends an institution of higher education that offers a doc-*
22 *toral degree in a field relevant to a mission area of the De-*
23 *partment.*

1 (b) *ESTABLISHMENT.*—*The Secretary shall establish a*
2 *graduate fellowship program for eligible students pursuing*
3 *a doctoral degree in a mission area of the Department.*

4 (c) *SELECTION.*—

5 (1) *IN GENERAL.*—*The Secretary shall award fel-*
6 *lowships to eligible students under this section*
7 *through a competitive merit review process (involving*
8 *written and oral interviews) that will result in a*
9 *wide distribution of awards throughout the United*
10 *States.*

11 (2) *CRITERIA.*—*The Secretary shall establish se-*
12 *lection criteria for awarding fellowships under this*
13 *section that require an eligible student to—*

14 (A) *pursue a field of science or engineering*
15 *of importance to the mission area of the Depart-*
16 *ment;*

17 (B) *rank in the upper 10 percent of the*
18 *class of the eligible student;*

19 (C) *demonstrate to the Secretary—*

20 (i) *the capacity to understand tech-*
21 *anical topics related to the fellowship that*
22 *can be derived from the first principles of*
23 *the technical topics;*

24 (ii) *imagination and creativity;*

1 (iii) leadership skills in organizations
2 or intellectual endeavors, demonstrated
3 through awards and past experience; and

4 (iv) excellent verbal and communica-
5 tion skills to explain, defend, and dem-
6 onstrate an understanding of technical sub-
7 jects related to the fellowship; and

8 (D) be a citizen or permanent resident alien
9 of the United States.

10 (d) AWARDS.—

11 (1) AMOUNT.—A fellowship awarded under this
12 section shall—

13 (A) provide an annual living stipend; and

14 (B) cover—

15 (i) graduate tuition at an institution
16 of higher education; and

17 (ii) incidental expenses associated with
18 curricula and research at the institution of
19 higher education (including books, com-
20 puters and software).

21 (2) DURATION.—A fellowship awarded under
22 this section shall be for a period of not longer than
23 5 years.

24 (3) PORTABILITY.—A fellowship awarded under
25 this section shall be portable with the fellow.

1 (e) *ADMINISTRATION.*—*The Secretary (acting through*
2 *the Director of Mathematics, Science, and Engineering*
3 *Education)*—

4 (1) *shall administer the program established*
5 *under this section; and,*

6 (2) *may enter into a contract with a nonprofit*
7 *entity to administer the program, including the selec-*
8 *tion and award of fellowships.*

9 (f) *REVOCATION.*—

10 (1) *IN GENERAL.*—*Nothing in this section pre-*
11 *vents the Secretary from refusing or revoking a fellow-*
12 *ship award, in whole or on part, in the case of any*
13 *applicant or recipient, if the Secretary determines*
14 *that such an award is not in the best interests of the*
15 *United States.*

16 (2) *NON-DELEGABLE.*—*The Secretary may not*
17 *delegate a determination made under paragraph (1).*

18 (g) *AUTHORIZATION OF APPROPRIATIONS.*—

19 (1) *FELLOWSHIPS.*—*There are authorized to be*
20 *appropriated to award fellowships under this sec-*
21 *tion—*

22 (A) *\$4,500,000 for 100 fellowships for fiscal*
23 *year 2007;*

1 (B) \$9,300,000 for 200 fellowships for fiscal
2 year 2008 (including non-expiring fellowships
3 for the prior fiscal year);

4 (C) \$14,500,000 for 300 fellowships for fis-
5 cal year 2009 (including non-expiring fellow-
6 ships for prior fiscal years);

7 (D) \$25,000,000 for 500 fellowships for fis-
8 cal year 2010 (including non-expiring fellow-
9 ships for prior fiscal years);

10 (E) \$35,500,000 for 700 fellowships for fis-
11 cal year 2011 (including non-expiring fellow-
12 ships for prior fiscal years);

13 (F) \$52,500,000 for 1,000 fellowships for
14 fiscal year 2012 (including non-expiring fellow-
15 ships for prior fiscal years); and

16 (G) \$54,000,000 for 1,000 fellowships for
17 fiscal year 2013 (including non-expiring fellow-
18 ships for prior fiscal years).

19 (2) ADMINISTRATION.—There are authorized to
20 be appropriated for administrative expenses incurred
21 in carrying out this section—

22 (A) \$1,000,000 for each of fiscal years 2007
23 and 2008;

24 (B) \$1,000,000 for fiscal year 2008;

25 (C) \$1,500,000 for fiscal year 2009;

1 (D) \$2,500,000 for fiscal year 2010;

2 (E) \$3,500,000 for fiscal year 2011;

3 (F) \$5,500,000 for fiscal year 2012; and

4 (G) \$5,500,000 for fiscal year 2013.

5 **SEC. 9. TITLE IX COMPLIANCE.**

6 (a) *IN GENERAL.*—Not later than 180 days after the
7 date of enactment of this Act, the Secretary of Energy shall
8 submit to the Committee on Energy and Commerce of the
9 House of Representatives and the Committee on Energy and
10 Natural Resources of the Senate a report that describes ac-
11 tions taken by the Department of Energy to implement the
12 recommendations in the report of the Government Account-
13 ability Office numbered 04–639.

14 (b) *COMPLIANCE.*—To comply with title IX of the Edu-
15 cation Amendments of 1972 (20 U.S.C. 1681 et seq.), the
16 Secretary of Energy shall annually conduct compliance re-
17 views of at least 2 recipients of Department of Energy
18 grants.

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A BILL

To improve the global competitiveness of the United States in science and energy technology, to strengthen basic research programs at the Department of Energy, and to provide support for mathematics and science education at all levels through the resources available through the Department of Energy, including at the National Laboratories.

APRIL 24, 2006

Reported with an amendment