

110TH CONGRESS
1ST SESSION

H. R. 2483

To provide for research, development, and demonstration on energy technologies to ensure the Nation's continued supply and efficient use of affordable, reliable, and clean energy, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MAY 24, 2007

Mr. HALL of Texas (for himself, Mrs. BIGGERT, Mr. McCAUL of Texas, Mr. SMITH of Texas, Mr. GINGREY, and Mr. INGLIS of South Carolina) introduced the following bill; which was referred to the Committee on Science and Technology

A BILL

To provide for research, development, and demonstration on energy technologies to ensure the Nation's continued supply and efficient use of affordable, reliable, and clean 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; TABLE OF CONTENTS.**

4 (a) SHORT TITLE.—This Act may be cited as the
5 “Energy for America Act”.

6 (b) TABLE OF CONTENTS.—The table of contents for
7 this Act is as follows:

Sec. 1. Short title; table of contents.

TITLE I—PRODUCED WATER

Sec. 101. Short title.
 Sec. 102. Findings.
 Sec. 103. Definitions.
 Sec. 104. Purposes.
 Sec. 105. Sunset.
 Sec. 106. Funding.

TITLE II—BIOMASS

Sec. 201. Short title.
 Sec. 202. Definitions.
 Sec. 203. Advanced biofuel technologies.
 Sec. 204. Bioenergy.

TITLE III—PLUG-IN HYBRID ELECTRIC VEHICLES

Sec. 301. Short title.
 Sec. 302. Near-term vehicle technology program.

TITLE IV—ENERGY STORAGE

Sec. 401. Short title.
 Sec. 402. Findings.
 Sec. 403. Energy storage systems for electricity transmission and distribution.

TITLE V—ENERGY EFFICIENT BUILDINGS

Sec. 501. Short title.
 Sec. 502. Energy efficient building grant program.

TITLE VI—ARPA-E

Sec. 601. Advanced Research Projects Authority-Energy (ARPA-E).

TITLE VII—GREEN ENERGY EDUCATION

Sec. 701. Short title.
 Sec. 702. Definition.
 Sec. 703. Graduate training in energy research and development.
 Sec. 704. Curriculum development for high performance building design.

TITLE VIII—CARBON CAPTURE AND SEQUESTRATION

Sec. 801. Carbon capture and sequestration study.

1 **TITLE I—PRODUCED WATER**

2 **SEC. 101. SHORT TITLE.**

3 This title may be cited as the “Produced Water Utili-
 4 zation Act of 2007”.

1 **SEC. 102. FINDINGS.**

2 The Congress finds as follows:

3 (1) The population of the United States is in-
4 creasing, and as the population increases, additional
5 potable water supplies are required to sustain indi-
6 viduals, agricultural production, and industrial
7 users, particularly in the Mountain West and desert
8 Southwest, where water resources are scarce.

9 (2) During the development of domestic energy
10 sources, including coalbed methane, oil, and natural
11 gas, water may be extracted from underground
12 sources and brought to the surface, often increasing
13 energy production from subsurface geological forma-
14 tions in the process.

15 (3) Produced water frequently contains in-
16 creased levels of potentially harmful dissolved solids,
17 rendering much of the water nonpotable and unsuit-
18 able for agricultural or industrial uses, and encour-
19 aging reinjection of the water to subsurface geologi-
20 cal formations to safely dispose of it, which may lead
21 to reduced production of domestic energy resources
22 and increased costs to producers.

23 (4) Increasing environmentally responsible sur-
24 face utilization of produced water would—

25 (A) increase water supplies available for
26 agricultural and industrial use;

1 (B) reduce the amount of produced water
2 returned to underground formations; and

3 (C) increase domestic energy production by
4 reducing costs associated with reinjection of
5 produced water to the subsurface.

6 **SEC. 103. DEFINITIONS.**

7 In this title:

8 (1) **EXISTING PROGRAM.**—The term “existing
9 program” means a program at the Department of
10 Energy which is engaged in research, development,
11 demonstration, and commercial application of tech-
12 nologies for unconventional domestic natural gas
13 production and other domestic petroleum production
14 as of the date of enactment of this Act.

15 (2) **PRODUCED WATER.**—The term “produced
16 water” means water from an underground source
17 that is brought to the surface as part of the process
18 of exploration for or development of coalbed meth-
19 ane, oil, natural gas, or any other substance to be
20 used as an energy source.

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

23 **SEC. 104. PURPOSES.**

24 (a) **IN GENERAL.**—The Secretary shall carry out
25 under this title, in conjunction with an existing program,

1 a program of research, development, and demonstration
2 of technologies for environmentally sustainable utilization
3 of produced water for use for agriculture, irrigation, mu-
4 nicipal, or industrial uses, or other environmentally sus-
5 tainable purposes. The program shall be designed to maxi-
6 mize the utilization of produced water in the United States
7 by increasing the quality of produced water and reducing
8 the environmental impacts of produced water.

9 (b) PROGRAM ELEMENTS.—The program under this
10 title shall address the following areas, including improving
11 safety and minimizing environmental impacts of activities
12 within each area:

13 (1) Produced water recovery, including research
14 for desalination and demineralization to reduce total
15 dissolved solids in the produced water.

16 (2) Produced water utilization for agricultural,
17 irrigation, municipal, or industrial uses, or other en-
18 vironmentally sustainable purposes.

19 (3) Reinjection of produced water into sub-
20 surface geological formations to increase energy pro-
21 duction.

22 (c) PROGRAM ADMINISTRATION.—The program
23 under this title shall be administered by a consortium, ad-
24 ministering an existing program, whose members have col-
25 lectively demonstrated capabilities and experience in plan-

1 ning and managing research, development, demonstration,
2 and commercial application programs for unconventional
3 natural gas and other petroleum production and produced
4 water utilization.

5 (d) **ACTIVITIES AT THE NATIONAL ENERGY TECH-**
6 **NOLOGY LABORATORY.**—The Secretary, through the Na-
7 tional Energy Technology Laboratory, shall carry out a
8 program of research, development, and demonstration ac-
9 tivities complementary to and supportive of the research,
10 development, and demonstration programs under sub-
11 section (b).

12 (e) **CONSULTATION.**—In carrying out this title, the
13 Secretary shall consult regularly with the Secretary of the
14 Interior and the Administrator of the Environmental Pro-
15 tection Agency.

16 **SEC. 105. SUNSET.**

17 The authority provided by this title shall terminate
18 on September 30, 2016.

19 **SEC. 106. FUNDING.**

20 (a) **ALLOCATION.**—Amounts appropriated for this
21 title for each fiscal year shall be allocated as follows:

22 (1) 75 percent shall be for activities under sec-
23 tion 104(a), (b), and (c).

24 (2) 25 percent shall be for activities under sec-
25 tion 104(d) and other activities under section 104,

1 including administrative functions such as program
2 direction, overall program oversight, and contract
3 management.

4 (b) AUTHORIZATION OF APPROPRIATIONS.—There
5 are authorized to be appropriated to carry out this title
6 \$20,000,000 for each of fiscal years 2008 through 2016.

7 **TITLE II—BIOMASS**

8 **SEC. 201. SHORT TITLE.**

9 This title may be cited as the “Biomass Research,
10 Development, and Demonstration Act of 2007”.

11 **SEC. 202. DEFINITIONS.**

12 For the purposes of this title—

13 (1) the term “institution of higher education”
14 has the meaning given that term in section 101(a)
15 of the Higher Education Act of 1965 (20 U.S.C.
16 1001(a)); and

17 (2) the term “Secretary” means the Secretary
18 of Energy.

19 **SEC. 203. ADVANCED BIOFUEL TECHNOLOGIES.**

20 (a) AMENDMENTS.—Section 932 of the Energy Pol-
21 icy Act of 2005 (42 U.S.C. 16232) is amended—

22 (1) in subsection (b)(2), by inserting “, includ-
23 ing motor and other fuels from biomass” after
24 “biofuels”; and

25 (2) in subsection (c)—

1 (A) by redesignating paragraphs (2)
2 through (4) as paragraphs (3) through (5), re-
3 spectively;

4 (B) by adding the following new paragraph
5 after paragraph (1):

6 “(2) technologies that would make biofuels pro-
7 duced from cellulosic feedstocks cost competitive
8 with biofuels produced from corn by 2012;”;

9 (C) in paragraph (3), as so redesignated
10 by subparagraph (A) of this paragraph, by in-
11 serting “, including through conducting re-
12 search and development on the production of
13 hydrocarbons and bioproducts other than eth-
14 anol from biomass” after “systems”; and

15 (D) in paragraph (4), as so redesignated
16 by subparagraph (A) of this paragraph, by in-
17 serting “, including through conducting re-
18 search and development on how to apply ad-
19 vanced genetic engineering and advanced bio-
20 engineering techniques to increase the efficiency
21 and lower the cost of industrial-scale production
22 of liquid fuels from cellulosic feedstocks” after
23 “facilities”.

24 (b) INSTITUTION OF HIGHER EDUCATION
25 GRANTS.—The Secretary shall designate not less than 10

1 percent of the funds appropriated for carrying out section
2 932(d) of the Energy Policy Act of 2005 (42 U.S.C.
3 16232(d)) for grants to competitively selected institutions
4 of higher education around the country focused on meet-
5 ing the objectives stated in such section 932(d).

6 (c) AUTHORIZATION OF APPROPRIATIONS.—Section
7 931(c) of the Energy Policy Act of 2005 (42 U.S.C.
8 16231(c)) is amended—

9 (1) in subsection (c)(1), by striking
10 “\$100,000,000” and inserting “\$150,000,000”;

11 (2) in subsection (c)(2), by striking
12 “\$125,000,000” and inserting “\$160,000,000”; and

13 (3) in subsection (c)(3), by striking
14 “\$150,000,000” and inserting “\$175,000,000”.

15 **SEC. 204. BIOENERGY.**

16 (a) BIOENERGY PROGRAM.—Section 932(d)(1)(B) of
17 the Energy Policy Act of 2005 (42 U.S.C.
18 16232(d)(1)(B)) is amended—

19 (1) by striking “and” at the end of clause (iii);
20 and

21 (2) by adding after clause (iv) the following new
22 clause:

23 “(v) biodegradable natural plastics in
24 or from biomass; and”.

1 (b) AUTHORIZATION OF APPROPRIATIONS.—Section
2 931 of the Energy Policy Act of 2005 (42 U.S.C. 16231)
3 is amended—

4 (1) in subsection (c)(1), by inserting before the
5 semicolon the following: “, including \$25,000,000
6 for activities under section 932(d)(1)(B)(v)”;

7 (2) in subsection (c)(2), by inserting before the
8 semicolon the following: “, including \$25,000,000
9 for activities under section 932(d)(1)(B)(v)”;

10 (3) in subsection (c)(3), by inserting before the
11 period the following: “, including \$25,000,000 for
12 activities under section 932(d)(1)(B)(v)”.

13 **TITLE III—PLUG-IN HYBRID**
14 **ELECTRIC VEHICLES**

15 **SEC. 301. SHORT TITLE.**

16 This title may be cited as the “Plug-In Hybrid Elec-
17 tric Vehicle Act of 2007”.

18 **SEC. 302. NEAR-TERM VEHICLE TECHNOLOGY PROGRAM.**

19 (a) DEFINITIONS.—In this section:

20 (1) BATTERY.—The term “battery” means a
21 device or system for the electrochemical storage of
22 energy.

23 (2) BIOMASS.—The term “biomass” has mean-
24 ing given the term in section 932 of the Energy Pol-
25 icy Act of 2005 (42 U.S.C. 16232).

1 (3) E85.—The term “E85” means a fuel blend
2 containing 85 percent ethanol and 15 percent gaso-
3 line by volume.

4 (4) ELECTRIC DRIVE TRANSPORTATION TECH-
5 NOLOGY.—The term “electric drive transportation
6 technology” means—

7 (A) vehicles that use an electric motor for
8 all or part of their motive power and that may
9 or may not use offboard electricity, including
10 battery electric vehicles, fuel cell vehicles, hy-
11 brid electric vehicles, plug-in hybrid electric ve-
12 hicles, flexible fuel plug-in hybrid electric vehi-
13 cles, and electric rail; and

14 (B) related equipment, including electric
15 equipment necessary to recharge a plug-in hy-
16 brid electric vehicle.

17 (5) FLEXIBLE FUEL PLUG-IN HYBRID ELEC-
18 TRIC VEHICLE.—The term “flexible fuel plug-in hy-
19 brid electric vehicle” means a plug-in hybrid electric
20 vehicle—

21 (A) warranted by its manufacturer as ca-
22 pable of operating on any combination of gaso-
23 line or E85 for its onboard internal combustion
24 or heat engine; or

1 (B) that uses a fuel cell for battery charg-
2 ing when disconnected from offboard power
3 sources.

4 (6) FUEL CELL VEHICLE.—The term “fuel cell
5 vehicle” means an onroad vehicle that uses a fuel
6 cell (as defined in section 803 of the Energy Policy
7 Act of 2005 (42 U.S.C. 16152)).

8 (7) HYBRID ELECTRIC VEHICLE.—The term
9 “hybrid electric vehicle” means an onroad vehicle
10 that—

11 (A) can operate on either liquid combus-
12 tible fuel or electric power provided by an on-
13 board battery; and

14 (B) utilizes regenerative power capture
15 technology to recover energy expended in brak-
16 ing the vehicle for use in recharging the bat-
17 tery.

18 (8) PLUG-IN HYBRID ELECTRIC VEHICLE.—The
19 term “plug-in hybrid electric vehicle” means a hy-
20 brid electric vehicle that can operate solely on elec-
21 tric power for a minimum of 20 miles under city
22 driving conditions, and that is capable of recharging
23 its battery from an offboard electricity source.

24 (9) SECRETARY.—The term “Secretary” means
25 the Secretary of Energy.

1 (b) PROGRAM.—The Secretary shall conduct a pro-
2 gram of research, development, demonstration, and com-
3 mercial application on technologies needed for the develop-
4 ment of plug-in hybrid electric vehicles, including—

5 (1) high capacity, high efficiency batteries, to—

6 (A) improve battery life, energy storage ca-
7 pacity, and power delivery capacity, and lower
8 cost; and

9 (B) minimize waste and hazardous mate-
10 rial production in the entire value chain, includ-
11 ing after the end of the useful life of the bat-
12 teries;

13 (2) high efficiency onboard and offboard charg-
14 ing components;

15 (3) high power drive train systems for pas-
16 senger and commercial vehicles and for supporting
17 equipment;

18 (4) onboard energy management systems, power
19 trains, and systems integration for plug-in hybrid
20 electric vehicles, flexible fuel plug-in hybrid electric
21 vehicles, and hybrid electric vehicles, including effi-
22 cient cooling systems and systems that minimize the
23 emissions profile of such vehicles; and

24 (5) lightweight materials, including research,
25 development, demonstration, and commercial appli-

1 cation to reduce the cost of materials such as steel
2 alloys and carbon fibers.

3 (c) PLUG-IN HYBRID ELECTRIC VEHICLE DEM-
4 ONSTRATION PROGRAM.—

5 (1) ESTABLISHMENT.—The Secretary shall es-
6 tablish a competitive grant pilot demonstration pro-
7 gram to provide not more than 25 grants annually
8 to State governments, local governments, metropoli-
9 tan transportation authorities, or combinations
10 thereof to carry out a project or projects for dem-
11 onstration of plug-in hybrid electric vehicles.

12 (2) APPLICATIONS.—

13 (A) REQUIREMENTS.—The Secretary shall
14 issue requirements for applying for grants
15 under the demonstration pilot program. The
16 Secretary shall require that applications, at a
17 minimum, include a description of how data will
18 be—

19 (i) collected on the—

20 (I) performance of the vehicle or
21 vehicles and the components, includ-
22 ing the battery, energy management,
23 and charging systems, under various
24 driving speeds, trip ranges, traffic,
25 and other driving conditions;

1 (II) costs of the vehicle or vehi-
2 cles, including acquisition, operating,
3 and maintenance costs, and how the
4 project or projects will be self-sus-
5 taining after Federal assistance is
6 completed; and

7 (III) emissions of the vehicle or
8 vehicles, including greenhouse gases,
9 and the amount of petroleum dis-
10 placed as a result of the project or
11 projects; and

12 (ii) summarized for dissemination to
13 the Department, other grantees, and the
14 public.

15 (B) PARTNERS.—An applicant under sub-
16 paragraph (A) may carry out a project or
17 projects under the pilot program in partnership
18 with one or more private entities.

19 (3) SELECTION CRITERIA.—

20 (A) PREFERENCE.—When making awards
21 under this subsection, the Secretary shall con-
22 sider each applicant's previous experience in-
23 volving plug-in hybrid electric vehicles and shall
24 give preference to proposals that—

1 (i) provide the greatest demonstration
2 per award dollar, with preference increas-
3 ing as the number of miles that a plug-in
4 hybrid electric vehicle can operate solely on
5 electric power under city driving conditions
6 increases; and

7 (ii) demonstrate the greatest commit-
8 ment on the part of the applicant to ensure
9 funding for the proposed project or
10 projects and the greatest likelihood that
11 each project proposed in the application
12 will be maintained or expanded after Fed-
13 eral assistance under this subsection is
14 completed.

15 (B) BREADTH OF DEMONSTRATIONS.—In
16 awarding grants under this subsection, the Sec-
17 retary shall ensure the program will dem-
18 onstrate plug-in hybrid electric vehicles under
19 various circumstances, including—

- 20 (i) driving speeds;
21 (ii) trip ranges;
22 (iii) driving conditions;
23 (iv) climate conditions; and
24 (v) topography,

1 to optimize understanding and function of plug-
2 in hybrid electric vehicles.

3 (4) PILOT PROJECT REQUIREMENTS.—

4 (A) SUBSEQUENT FUNDING.—An applicant
5 that has received a grant in one year may apply
6 for additional funds in subsequent years, but
7 the Secretary shall not provide more than
8 \$10,000,000 in Federal assistance under the
9 pilot program to any applicant for the period
10 encompassing fiscal years 2008 through fiscal
11 year 2012.

12 (B) INFORMATION.—The Secretary shall
13 establish mechanisms to ensure that the infor-
14 mation and knowledge gained by participants in
15 the pilot program are shared among the pilot
16 program participants and are available to other
17 interested parties, including other applicants.

18 (5) AWARD AMOUNTS.—The Secretary shall de-
19 termine grant amounts, but the maximum size of
20 grants shall decline as the cost of producing plug-in
21 hybrid electric vehicles declines or the cost of con-
22 verting a hybrid electric vehicle to a plug-in hybrid
23 electric vehicle declines.

24 (d) COST SHARING.—The Secretary shall carry out
25 the program under this section in compliance with section

1 988(a) through (d) and section 989 of the Energy Policy
2 Act of 2005 (42 U.S.C. 16352(a) through (d) and 16353).

3 (e) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to the Secretary—

5 (1) for carrying out subsection (b),
6 \$250,000,000 for each of fiscal years 2008 through
7 2012, of which up to \$50,000,000 may be used for
8 the program described in paragraph (5) of that sub-
9 section; and

10 (2) for carrying out subsection (c), \$50,000,000
11 for each of fiscal years 2008 through 2012.

12 **TITLE IV—ENERGY STORAGE**

13 **SEC. 401. SHORT TITLE.**

14 This title may be cited as the “Energy Storage Solu-
15 tions for America Act of 2007”.

16 **SEC. 402. FINDINGS.**

17 The Congress finds that—

18 (1) as demand rises by an estimated 40 percent
19 in the electricity sector by 2030, we will need solu-
20 tions that are clean, reliable, and affordable; and

21 (2) improved energy storage capability will
22 allow for more wind and solar energy because it ad-
23 dresses the problem of intermittency inherent in
24 these renewable sources of energy.

1 **SEC. 403. ENERGY STORAGE SYSTEMS FOR ELECTRICITY**
2 **TRANSMISSION AND DISTRIBUTION.**

3 (a) DEFINITIONS.—In this section:

4 (1) COUNCIL.—The term “Council” means the
5 Energy Storage Advisory Council established under
6 subsection (c).

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

9 (3) SECRETARY.—The term “Secretary” means
10 the Secretary of Energy.

11 (b) PROGRAM.—The Secretary shall carry out a re-
12 search, development, and demonstration program to sup-
13 port the ability of the United States to remain globally
14 competitive in energy storage systems for electricity trans-
15 mission and distribution.

16 (c) ENERGY STORAGE ADVISORY COUNCIL.—

17 (1) ESTABLISHMENT.—Not later than 90 days
18 after the date of enactment of this Act, the Sec-
19 retary shall establish an Energy Storage Advisory
20 Council.

21 (2) COMPOSITION.—

22 (A) IN GENERAL.—Subject to subpara-
23 graph (B), the Council shall consist of not less
24 than 15 individuals appointed by the Secretary,
25 based on recommendations of the National
26 Academy of Sciences.

1 (B) ENERGY STORAGE INDUSTRY.—The
2 Council shall consist primarily of representa-
3 tives of the energy storage industry of the
4 United States.

5 (C) CHAIRPERSON.—The Secretary shall
6 select a Chairperson for the Council from
7 among the members appointed under subpara-
8 graph (A).

9 (3) MEETINGS.—

10 (A) IN GENERAL.—The Council shall meet
11 not less than once a year.

12 (B) FEDERAL ADVISORY COMMITTEE
13 ACT.—The Federal Advisory Committee Act (5
14 U.S.C. App. 2) shall apply to a meeting of the
15 Council.

16 (4) PLANS.—Not later than 1 year after the
17 date of enactment of this Act, in conjunction with
18 the Secretary, the Council shall develop 5-year plans
19 for integrating basic and applied research so that
20 the United States retains a globally competitive do-
21 mestic energy storage industry for electricity trans-
22 mission and distribution.

23 (5) REVIEW.—The Council shall—

1 (A) assess the performance of the Depart-
2 ment in meeting the goals of the plans devel-
3 oped under paragraph (4); and

4 (B) make specific recommendations to the
5 Secretary on programs or activities that should
6 be established or terminated to meet those
7 goals.

8 (d) BASIC RESEARCH PROGRAM.—The Secretary
9 shall conduct a basic research program on energy storage
10 systems to support electricity transmission and distribu-
11 tion, including—

- 12 (1) materials design;
- 13 (2) materials synthesis and characterization;
- 14 (3) electrolytes, including bioelectrolytes;
- 15 (4) surface and interface dynamics; and
- 16 (5) modeling and simulation.

17 (e) APPLIED RESEARCH PROGRAM.—The Secretary
18 shall conduct an applied research program on energy stor-
19 age systems to support electricity transmission and dis-
20 tribution technologies.

21 (f) REVIEW BY NATIONAL ACADEMY OF SCIENCES.—
22 Not later than 5 years after the date of enactment of this
23 Act, the Secretary shall offer to enter into an arrangement
24 with the National Academy of Sciences to assess the per-
25 formance of the Department in making the United States

1 globally competitive in energy storage systems for elec-
 2 tricity transmission and distribution.

3 (g) AUTHORIZATION OF APPROPRIATIONS.—There
 4 are authorized to be appropriated to the Secretary to carry
 5 out—

6 (1) the basic research program under sub-
 7 section (d) \$50,000,000 for each of fiscal years 2008
 8 through 2012; and

9 (2) the applied research program under sub-
 10 section (e) \$80,000,000 for each of fiscal years 2008
 11 through 2012.

12 **TITLE V—ENERGY EFFICIENT** 13 **BUILDINGS**

14 **SEC. 501. SHORT TITLE.**

15 This title may be cited as the “Energy Efficient
 16 Buildings Act of 2007”.

17 **SEC. 502. ENERGY EFFICIENT BUILDING GRANT PROGRAM.**

18 (a) ENERGY EFFICIENT BUILDING PILOT GRANT
 19 PROGRAM.—

20 (1) IN GENERAL.—Not later than 6 months
 21 after the date of enactment of this Act, the Sec-
 22 retary of Energy (in this title referred to as the
 23 “Secretary”) shall establish a pilot program to
 24 award grants to businesses and organizations for
 25 new construction of energy efficient buildings, or

1 major renovations of buildings that will result in en-
2 ergy efficient buildings, to demonstrate innovative
3 energy efficiency technologies, especially those spon-
4 sored by the Department of Energy.

5 (2) AWARDS.—The Secretary shall award
6 grants under this subsection competitively to those
7 applicants whose proposals—

8 (A) best demonstrate—

9 (i) likelihood to meet or exceed the
10 standards referred to in subsection (b)(2);

11 (ii) likelihood to maximize cost-effec-
12 tive energy efficiency opportunities; and

13 (iii) advanced energy efficiency tech-
14 nologies; and

15 (B) maximize the leverage of private in-
16 vestment for costs related to increasing the en-
17 ergy efficiency of the building.

18 (3) CONSIDERATION.—The Secretary shall give
19 due consideration to proposals for buildings that are
20 likely to serve low and moderate income populations.

21 (4) AMOUNT OF GRANTS.—Grants under this
22 subsection shall be for up to 50 percent of design
23 and energy modeling costs, not to exceed \$50,000
24 per building. No single grantee may be eligible for
25 more than 3 grants per year under this program.

1 (5) GRANT PAYMENTS.—

2 (A) INITIAL PAYMENT.—The Secretary
3 shall pay 50 percent of the total amount of the
4 grant to grant recipients upon selection.

5 (B) REMAINDER OF PAYMENT.—The Sec-
6 retary shall pay the remaining 50 percent of the
7 grant only after independent certification, by a
8 professional engineer or other qualified profes-
9 sional, that operational buildings are energy ef-
10 ficient buildings as defined in subsection (b).

11 (C) FAILURE TO COMPLY.—The Secretary
12 shall not provide the remainder of the payment
13 unless the building is certified within 6 months
14 after operation of the completed building to
15 meet the requirements described in subpara-
16 graph (B), or in the case of major renovations
17 the building is certified within 6 months of the
18 completion of the renovations.

19 (6) REPORT TO CONGRESS.—Not later than 3
20 years after awarding the first grant under this sub-
21 section, the Secretary shall transmit to Congress a
22 report containing—

23 (A) the total number and dollar amount of
24 grants awarded under this subsection; and

1 (B) an estimate of aggregate cost and en-
2 ergy savings enabled by the pilot program
3 under this subsection.

4 (7) ADMINISTRATIVE EXPENSES.—Administra-
5 tive expenses for the program under this subsection
6 shall not exceed 10 percent of appropriated funds.

7 (b) DEFINITION OF ENERGY EFFICIENT BUILD-
8 ING.—For purposes of this section the term “energy effi-
9 cient building” means a building that—

10 (1) achieves a reduction in energy consumption
11 of—

12 (A) at least 30 percent for new construc-
13 tion, compared to the energy standards set by
14 the 2004 International Energy Conservation
15 Code (in the case of residential buildings) or
16 ASHRAE Standard 90.1–2004; or

17 (B) at least 20 percent for major renova-
18 tions, compared to energy consumption before
19 renovations are begun;

20 (2) is constructed or renovated in accordance
21 with the most current, appropriate, and applicable
22 voluntary consensus standards, as determined by the
23 Secretary, such as those listed in the assessment
24 under section 914(b), or revised or developed under

1 section 914(c), of the Energy Policy Act of 2005;
2 and

3 (3) after construction or renovation—

4 (A) uses heating, ventilating, and air con-
5 ditioning systems that perform at no less than
6 Energy Star standards; or

7 (B) if Energy Star standards are not ap-
8 plicable, uses Federal Energy Management Pro-
9 gram recommended heating, ventilating, and air
10 conditioning products.

11 (c) AUTHORIZATION OF APPROPRIATIONS.—There
12 are authorized to be appropriated to the Secretary for car-
13 rying out this section \$10,000,000 for each of the fiscal
14 years 2008 through 2012.

15 **TITLE VI—ARPA-E**

16 **SEC. 601. ADVANCED RESEARCH PROJECTS AUTHORITY-** 17 **ENERGY (ARPA-E).**

18 (a) FINDINGS.—The Congress finds the following:

19 (1) The Department of Energy through existing
20 authorities and programs promotes technology trans-
21 fer of basic and applied research funded by the De-
22 partment of Energy and performed at its national
23 laboratories, nonprofit and educational institutions,
24 and the private sector, but there is a need to more
25 quickly identify opportunities to accelerate the com-

1 mercial application of new energy technologies to
2 meet national energy needs.

3 (2) The principal Department of Energy pro-
4 gram organizations that already oversee various
5 projects for basic and applied research and commer-
6 cialization of new energy technologies are the Office
7 of Science, the Office of Energy Efficiency and Re-
8 newable Energy, the National Nuclear Security Ad-
9 ministration, the Office of Fossil Energy, the Office
10 of Electricity Delivery and Energy Reliability, and
11 the Office of Nuclear Energy.

12 (3) A more fully integrated Departmental ap-
13 proach to advanced energy research will help bridge
14 the gap between basic research and applied tech-
15 nology to overcome long-term and high-risk techno-
16 logical barriers to the development of advanced en-
17 ergy technologies.

18 (b) DEFINITIONS.—For purposes of this section—

19 (1) the term “ARPA–E project” means a
20 project identified by the Secretary that shows prom-
21 ise to accelerate efforts to overcome long-term and
22 high-risk technological barriers to the development
23 of advanced energy technologies, including projects
24 on—

1 (A) advanced basic energy-related research
2 that shows unique innovation and scientific and
3 technical merit and the potential for commercial
4 application;

5 (B) development of resultant technologies
6 and processes for energy supply and efficient
7 end use; and

8 (C) demonstration and commercial applica-
9 tion of the most promising energy technologies
10 and research applications on both a large and
11 small scale; and

12 (2) the term “Secretary” means the Secretary
13 of Energy.

14 (c) SELECTION CRITERIA.—In identifying ARPA–E
15 projects for support, the Secretary shall—

16 (1) ensure that ARPA–E projects do not alter
17 the Department’s current balance of effort along the
18 spectrum of energy research and development activi-
19 ties;

20 (2) consider the novelty, scientific and technical
21 merit, and potential transformative nature of the
22 proposed projects;

23 (3) consider the demonstrated capabilities of
24 the applicants to successfully carry out the proposed
25 research project;

1 (4) consider the viability of avenues for com-
2 mercial application, including the transfer of tech-
3 nologies to the private and public sector; and

4 (5) consider such other criteria as are estab-
5 lished by the Secretary.

6 (d) AUTHORIZATION.—There are authorized to be ap-
7 propriated to the Secretary for carrying out ARPA–E
8 projects—

9 (1) \$100,000,000 for fiscal year 2008;

10 (2) \$125,000,000 for fiscal year 2009;

11 (3) \$150,000,000 for fiscal year 2010;

12 (4) \$275,000,000 for fiscal year 2011; and

13 (5) \$100,000,000 for fiscal year 2012.

14 (e) PERSONNEL.—

15 (1) HIRING OF PERSONNEL.—The Secretary
16 shall carry out a program of experimental use of
17 special personnel management authority in order to
18 facilitate recruitment of eminent experts in science
19 or engineering for ARPA–E projects.

20 (2) SPECIAL PERSONNEL MANAGEMENT AU-
21 THORITY.—Under such program the Secretary may
22 utilize the hiring and management authorities de-
23 scribed in section 1101(b), (c), and (d) of the Strom
24 Thurmond National Defense Authorization Act for

1 Fiscal Year 1999 (5 U.S.C. 3104 note), except
2 that—

3 (A) for purposes of subsection (b)(1), the
4 number of positions that may be appointed
5 shall be no more than 20; and

6 (B) for purposes of subsection (c), the
7 term of initial appointments for employees may
8 not exceed 3 years.

9 (f) PROTECTION OF INFORMATION.—

10 (1) IN GENERAL.—Disclosure of information
11 that is submitted to the Department of Energy
12 under a competitive or noncompetitive process pur-
13 suant to the authority granted in this section is not
14 required under section 552 of title 5, United States
15 Code, for five years after the date on which the in-
16 formation is received by the Department of Energy.
17 Such information includes—

18 (A) a proposal, proposal abstract, and sup-
19 porting documents;

20 (B) a business plan submitted on a con-
21 fidential basis; or

22 (C) technical information submitted on a
23 confidential basis.

24 (2) PROJECT INFORMATION.—The Secretary,
25 for a period of up to five years from the receipt by

1 the Department of information that results from any
2 transaction identified as an ARPA–E project, and
3 which is of a character that it would be protected
4 from disclosure under the meaning of section
5 552(b)(4) of title 5, United States Code, if the infor-
6 mation had been obtained from a non-Government
7 party, may provide appropriate protections against
8 the dissemination of such information, including ex-
9 emption from subchapter II of chapter 5 of title 5,
10 United States Code.

11 (g) COST SHARING.—Any transaction authorized by
12 this section shall be cost shared according to the principles
13 set forth in section 988 of the Energy Policy Act of 2005
14 (42 U.S.C. 16352).

15 (h) COORDINATION WITH OTHER AGENCIES.—The
16 Secretary may coordinate program activities associated
17 with an ARPA–E project with other agencies, and may
18 enter into agreements with other agencies to further the
19 success of an ARPA–E project. Where appropriate the
20 Secretary shall coordinate technology transfer efforts with
21 the Technology Transfer Coordinator established in sec-
22 tion 1001 of the Energy Policy Act of 2005.

23 (i) AWARD OF PRIZE MONEY.—To the extent consid-
24 ered appropriate by the Secretary, the Secretary may exer-
25 cise the authority provided in section 1008 of the Energy

1 Policy Act of 2005 (42 U.S.C. 16396) to award prizes for
2 achievements under an ARPA–E project.

3 (j) RELATIONSHIP TO OTHER AUTHORITIES.—The
4 authorities granted by this section are in addition to exist-
5 ing authorities granted to the Secretary, and are not in-
6 tended to supersede or modify any existing authorities.

7 (k) ISSUANCE OF DIRECTIVE.—Not later than 120
8 days after the date of enactment of this Act, the Depart-
9 ment of Energy shall issue a Directive that sets forth how
10 the Department intends to identify, manage, and admin-
11 ister ARPA–E projects.

12 (l) INITIAL PROJECTS.—Not later than 270 days
13 after the date of enactment of this Act, the Secretary shall
14 designate up to 2 ARPA–E projects for funding.

15 (m) REPORT TO CONGRESS.—Not later than one year
16 after the date of enactment of this Act, the Secretary shall
17 submit a report to Congress describing the status of any
18 proposed or existing ARPA–E projects.

19 (n) POSITIVE RECOMMENDATION.—The Secretary
20 shall take no actions under this section unless the study
21 conducted under section 1821(b)(3) of the Energy Policy
22 Act of 2005 contains a recommendation that the manage-
23 ment practices used by the Defense Advanced Research
24 Projects Agency are applicable to the research programs
25 at the Department of Energy.

1 **TITLE VII—GREEN ENERGY**
2 **EDUCATION**

3 **SEC. 701. SHORT TITLE.**

4 This title may be cited as the “Green Energy Edu-
5 cation Act of 2007”.

6 **SEC. 702. DEFINITION.**

7 For the purposes of this title:

8 (1) **DIRECTOR.**—The term “Director” means
9 the Director of the National Science Foundation.

10 (2) **HIGH PERFORMANCE BUILDING.**—The term
11 “high performance building” has the meaning given
12 that term in section 914(a) of the Energy Policy Act
13 of 2005 (42 U.S.C. 16194(a)).

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

16 **SEC. 703. GRADUATE TRAINING IN ENERGY RESEARCH AND**
17 **DEVELOPMENT.**

18 (a) **FUNDING.**—In carrying out research, develop-
19 ment, demonstration, and commercial application activi-
20 ties authorized for the Department of Energy, the Sec-
21 retary may contribute funds to the National Science Foun-
22 dation for the Integrative Graduate Education and Re-
23 search Traineeship program to support projects that en-
24 able graduate education related to such activities.

1 (b) CONSULTATION.—The Director shall consult with
2 the Secretary when preparing solicitations and awarding
3 grants for projects described in subsection (a).

4 **SEC. 704. CURRICULUM DEVELOPMENT FOR HIGH PER-**
5 **FORMANCE BUILDING DESIGN.**

6 (a) FUNDING.—In carrying out advanced energy
7 technology research, development, demonstration, and
8 commercial application activities authorized for the De-
9 partment of Energy related to high performance buildings,
10 the Secretary may contribute funds to curriculum develop-
11 ment activities at the National Science Foundation for the
12 purpose of improving undergraduate or graduate inter-
13 disciplinary engineering and architecture education related
14 to the design and construction of high performance build-
15 ings, including development of curricula, of laboratory ac-
16 tivities, of training practicums, or of design projects. A
17 primary goal of curriculum development activities sup-
18 ported under this section shall be to improve the ability
19 of engineers, architects, landscape architects, and planners
20 to work together on the incorporation of advanced energy
21 technologies during the design and construction of high
22 performance buildings.

23 (b) CONSULTATION.—The Director shall consult with
24 the Secretary when preparing solicitations and awarding
25 grants for projects described in subsection (a).

1 (c) PRIORITY.—In awarding grants with respect to
2 which the Secretary has contributed funds under this sec-
3 tion, the Director shall give priority to applications from
4 departments, programs, or centers of a school of engineer-
5 ing that are partnered with schools, departments, or pro-
6 grams of design, architecture, and city, regional, or urban
7 planning.

8 **TITLE VIII—CARBON CAPTURE**
9 **AND SEQUESTRATION**

10 **SEC. 801. CARBON CAPTURE AND SEQUESTRATION STUDY.**

11 Not later than 2 years after the date of enactment
12 of this Act, the Secretary of Energy shall transmit to the
13 Congress the results of a study on the feasibility of large-
14 scale biological sequestration of carbon dioxide for coal
15 power systems, including an analysis of the feasibility of
16 creating a closed loop carbon cycle through biological se-
17 questration.

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