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# H. R. 6203

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IN THE SENATE OF THE UNITED STATES

SEPTEMBER 30 (legislative day, SEPTEMBER 29), 2006

Received

NOVEMBER 13, 2006

Read twice and referred to the Committee on Energy and Natural Resources

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## AN ACT

To provide for Federal energy research, development, demonstration, and commercial application activities, 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,*

1 **SECTION 1. SHORT TITLE.**

2 This Act may be cited as the “Alternative Energy Re-  
3 search and Development Act”.

4 **SEC. 2. DEFINITIONS.**

5 For the purposes of this Act—

6 (1) the term “biomass” has the meaning given  
7 that term in section 932(a)(1) of the Energy Policy  
8 Act of 2005 (42 U.S.C. 16232(a)(1));

9 (2) the term “cellulosic feedstock” has the  
10 meaning given the term “lignocellulosic feedstock”  
11 in section 932(a)(2) of the Energy Policy Act of  
12 2005 (42 U.S.C. 16232(a)(2));

13 (3) the term “Department” means the Depart-  
14 ment of Energy;

15 (4) the term “institution of higher education”  
16 has the meaning given that term in section 101(a)  
17 of the Higher Education Act of 1965 (20 U.S.C.  
18 1001(a));

19 (5) the term “National Laboratory” has the  
20 meaning given the term “nonmilitary energy labora-  
21 tory” in section 903(3) of the Energy Policy Act of  
22 2005 (42 U.S.C. 16182(3)); and

23 (6) the term “Secretary” means the Secretary  
24 of Energy.

1 **SEC. 3. ADVANCED BIOFUEL TECHNOLOGIES.**

2 (a) IN GENERAL.—The Secretary shall carry out a  
3 program of research, development, demonstration, and  
4 commercial application for production of motor and other  
5 fuels from biomass.

6 (b) OBJECTIVES.—The Secretary shall design the  
7 program under this section to—

8 (1) develop technologies that would make eth-  
9 anol produced from cellulosic feedstocks cost com-  
10 petitive with ethanol produced from corn by 2012;

11 (2) conduct research and development on how  
12 to apply advanced genetic engineering and bio-  
13 engineering techniques to increase the efficiency and  
14 lower the cost of industrial-scale production of liquid  
15 fuels from cellulosic feedstocks; and

16 (3) conduct research and development on the  
17 production of hydrocarbons other than ethanol from  
18 biomass.

19 (c) INSTITUTION OF HIGHER EDUCATION GRANTS.—  
20 The Secretary shall designate not less than 10 percent of  
21 the funds appropriated under subsection (d) for each fiscal  
22 year to carry out the program for grants to competitively  
23 selected institutions of higher education around the coun-  
24 try focused on meeting the objectives stated in subsection  
25 (b).

1 (d) AUTHORIZATION OF APPROPRIATIONS.—From  
2 amounts authorized to be appropriated under section  
3 931(c) of the Energy Policy Act of 2005 (42 U.S.C.  
4 16231(c)), there are authorized to be appropriated to the  
5 Secretary to carry out this section—

6 (1) \$150,000,000 for fiscal year 2007; and

7 (2) such sums as may be necessary for each of  
8 the fiscal years 2008 and 2009.

9 **SEC. 4. ADVANCED HYDROGEN STORAGE TECHNOLOGIES.**

10 (a) IN GENERAL.—The Secretary shall carry out a  
11 program of research, development, demonstration, and  
12 commercial application for technologies to enable practical  
13 onboard storage of hydrogen for use as a fuel for light-  
14 duty motor vehicles.

15 (b) OBJECTIVE.—The Secretary shall design the pro-  
16 gram under this section to develop practical hydrogen  
17 storage technologies that would enable a hydrogen-fueled  
18 light-duty motor vehicle to travel 300 miles before refuel-  
19 ing.

20 **SEC. 5. ADVANCED SOLAR PHOTOVOLTAIC TECHNOLOGIES.**

21 (a) IN GENERAL.—The Secretary shall carry out a  
22 program of research, development, demonstration, and  
23 commercial application for advanced solar photovoltaic  
24 technologies.

1 (b) OBJECTIVES.—The Secretary shall design the  
2 program under this section to develop technologies that  
3 would—

4 (1) make electricity generated by solar photo-  
5 voltaic power cost-competitive by 2015; and

6 (2) enable the widespread use of solar photo-  
7 voltaic power.

8 (c) AUTHORIZATION OF APPROPRIATIONS.—There  
9 are authorized to be appropriated to the Secretary to carry  
10 out this section—

11 (1) \$148,000,000 for fiscal year 2007; and

12 (2) such sums as may be necessary for each of  
13 the fiscal years 2008 through 2011.

14 **SEC. 6. ADVANCED WIND ENERGY TECHNOLOGIES.**

15 (a) IN GENERAL.—The Secretary shall carry out a  
16 program of research, development, demonstration, and  
17 commercial application for advanced wind energy tech-  
18 nologies.

19 (b) OBJECTIVES.—The Secretary shall design the  
20 program under this section to—

21 (1) improve the efficiency and lower the cost of  
22 wind turbines;

23 (2) minimize adverse environmental impacts;  
24 and

1           (3) develop new small-scale wind energy tech-  
2           nologies for use in low wind speed environments.

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

6           (1) \$44,000,000 for fiscal year 2007; and

7           (2) such sums as may be necessary for each of  
8           the fiscal years 2008 through 2011.

9 **SEC. 7. CONTINUING PROGRAMS.**

10          The Secretary shall continue to carry out the re-  
11 search, development, demonstration, and commercial ap-  
12 plication activities authorized in sections 921(b)(1) (for  
13 distributed energy), 923 (for micro-cogeneration tech-  
14 nology), and 931(a)(2)(C), (D), and (E)(i) (for geothermal  
15 energy, hydropower, and ocean energy) of the Energy Pol-  
16 icy Act of 2005.

17 **SEC. 8. PLUG-IN HYBRID ELECTRIC VEHICLE TECHNOLOGY**  
18 **PROGRAM.**

19          (a) **SHORT TITLE.**—This section may be cited as the  
20 “Plug-In Hybrid Electric Vehicle Act of 2006”.

21          (b) **DEFINITIONS.**—In this section:

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

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

4           (3) 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, hybrid electric vehicles,  
11                  plug-in hybrid electric vehicles, flexible fuel  
12                  plug-in hybrid electric vehicles, and electric rail;  
13                  and

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

17           (4) 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 warranted by its manufacturer as capable of  
21           operating on any combination of gasoline or E85 for  
22           its onboard internal combustion or heat engine.

23           (5) HYBRID ELECTRIC VEHICLE.—The term  
24           “hybrid electric vehicle” means a vehicle that—

1 (A) can be propelled using liquid combus-  
2 tible fuel and electric power provided by an on-  
3 board battery; and

4 (B) utilizes regenerative power capture  
5 technology to recover energy expended in brak-  
6 ing the vehicle for use in recharging the bat-  
7 tery.

8 (6) PLUG-IN HYBRID ELECTRIC VEHICLE.—The  
9 term “plug-in hybrid electric vehicle” means a hy-  
10 brid electric onroad light-duty vehicle that can be  
11 propelled solely on electric power for a minimum of  
12 20 miles under city driving conditions, and that is  
13 capable of recharging its battery from an offboard  
14 electricity source.

15 (c) PROGRAM.—The Secretary shall conduct a pro-  
16 gram of research, development, demonstration, and com-  
17 mercial application on technologies needed for the develop-  
18 ment of plug-in hybrid electric vehicles and electric drive  
19 transportation, including—

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

21 (A) improve battery life, energy storage ca-  
22 pacity, and power delivery capacity, and lower  
23 cost; and

24 (B) minimize waste and hazardous mate-  
25 rial production in the entire value chain, includ-

1           ing after the end of the useful life of the bat-  
2           teries;

3           (2) high efficiency onboard and offboard charg-  
4           ing components;

5           (3) high power drive train systems for pas-  
6           senger and commercial vehicles and for supporting  
7           equipment;

8           (4) onboard energy management systems, power  
9           trains, and systems integration for plug-in hybrid  
10          electric vehicles, flexible fuel plug-in hybrid electric  
11          vehicles, and hybrid electric vehicles, including effi-  
12          cient cooling systems and systems that minimize the  
13          emissions profile of such vehicles; and

14          (5) lightweight materials, including research,  
15          development, demonstration, and commercial appli-  
16          cation to reduce the cost of materials such as steel  
17          alloys and carbon fibers.

18          (d) PLUG-IN HYBRID ELECTRIC VEHICLE DEM-  
19          ONSTRATION PROGRAM.—

20                 (1) ESTABLISHMENT.—The Secretary shall es-  
21                 tablish a competitive grant pilot demonstration pro-  
22                 gram to provide not more than 25 grants annually  
23                 to State governments, local governments and public  
24                 entities, metropolitan transportation authorities, or  
25                 combinations thereof to carry out a project or

1 projects for demonstration of plug-in hybrid electric  
2 vehicles.

3 (2) APPLICATIONS.—

4 (A) REQUIREMENTS.—The Secretary shall  
5 issue requirements for applying for grants  
6 under the demonstration pilot program. The  
7 Secretary shall require that applications, at a  
8 minimum, include a description of how data will  
9 be—

10 (i) collected on the—

11 (I) performance of the vehicle or  
12 vehicles and the components, includ-  
13 ing the battery, energy management,  
14 and charging systems, under various  
15 driving speeds, trip ranges, traffic,  
16 and other driving conditions;

17 (II) costs of the vehicle or vehi-  
18 cles, including acquisition, operating,  
19 and maintenance costs, and how the  
20 project or projects will be self-sus-  
21 taining after Federal assistance is  
22 completed; and

23 (III) emissions of the vehicle or  
24 vehicles, including greenhouse gases,  
25 and the amount of petroleum dis-

1 placed as a result of the project or  
2 projects; and

3 (ii) summarized for dissemination to  
4 the Department, other grantees, and the  
5 public.

6 (B) PARTNERS.—An applicant under sub-  
7 paragraph (A) may carry out a project or  
8 projects under the pilot program in partnership  
9 with one or more private or nonprofit entities,  
10 which may include institutions of higher edu-  
11 cation, including Historically Black Colleges  
12 and Universities, Hispanic Serving Institutions,  
13 and other minority-serving institutions.

14 (3) SELECTION CRITERIA.—

15 (A) PREFERENCE.—When making awards  
16 under this subsection, the Secretary shall con-  
17 sider each applicant’s previous experience in-  
18 volving plug-in hybrid electric vehicles and shall  
19 give preference to proposals that—

20 (i) provide the greatest demonstration  
21 per award dollar, with preference increas-  
22 ing as the number of miles that a plug-in  
23 hybrid electric vehicle can be propelled  
24 solely on electric power under city driving  
25 conditions increases; and

1 (ii) maximize the non-Federal share of  
2 project funding and demonstrate the great-  
3 est likelihood that each project proposed in  
4 the application will be maintained or ex-  
5 panded after Federal assistance under this  
6 subsection is completed.

7 (B) BREADTH OF DEMONSTRATIONS.—In  
8 awarding grants under this subsection, the Sec-  
9 retary shall ensure the program will dem-  
10 onstrate plug-in hybrid electric vehicles under  
11 various circumstances, including—

- 12 (i) driving speeds;  
13 (ii) trip ranges;  
14 (iii) driving conditions;  
15 (iv) climate conditions; and  
16 (v) topography,

17 to optimize understanding and function of plug-  
18 in hybrid electric vehicles.

19 (4) PILOT PROJECT REQUIREMENTS.—

20 (A) SUBSEQUENT FUNDING.—An applicant  
21 that has received a grant in one year may apply  
22 for additional funds in subsequent years, but  
23 the Secretary shall not provide more than  
24 \$10,000,000 in Federal assistance under the  
25 pilot program to any applicant for the period

1 encompassing fiscal years 2007 through fiscal  
2 year 2011.

3 (B) INFORMATION.—The Secretary shall  
4 establish mechanisms to ensure that the infor-  
5 mation and knowledge gained by participants in  
6 the pilot program are shared among the pilot  
7 program participants and are available to other  
8 interested parties, including other applicants.

9 (5) AWARD AMOUNTS.—The Secretary shall de-  
10 termine grant amounts, but the maximum size of  
11 grants shall decline as the cost of producing plug-in  
12 hybrid electric vehicles declines or the cost of con-  
13 verting a hybrid electric vehicle to a plug-in hybrid  
14 electric vehicle declines.

15 (e) COST SHARING.—The Secretary shall carry out  
16 the program under this section in compliance with section  
17 988(a) through (d) and section 989 of the Energy Policy  
18 Act of 2005 (42 U.S.C. 16352(a) through (d) and 16353).

19 (f) AUTHORIZATION OF APPROPRIATIONS.—There  
20 are authorized to be appropriated to the Secretary—

21 (1) for carrying out subsection (e),  
22 \$100,000,000 for fiscal year 2008 and such sums as  
23 may be necessary for each of the fiscal years 2009  
24 through 2011; and

1           (2) for carrying out subsection (d),  
2           \$50,000,000 for fiscal year 2008 and such sums as  
3           may be necessary for each of the fiscal years 2009  
4           through 2011.

5 **SEC. 9. PHOTOVOLTAIC DEMONSTRATION PROGRAM.**

6           (a) **SHORT TITLE.**—This section may be cited as the  
7 “Solar Utilization Now Demonstration Act of 2006” or  
8 the “SUN Act of 2006”.

9           (b) **IN GENERAL.**—The Secretary shall establish a  
10 program of grants to States to demonstrate advanced pho-  
11 tovoltaic technology.

12           (c) **REQUIREMENTS.**—

13           (1) **ABILITY TO MEET REQUIREMENTS.**—To re-  
14 ceive funding under the program under this section,  
15 a State must submit a proposal that demonstrates,  
16 to the satisfaction of the Secretary, that the State  
17 will meet the requirements of subsection (g).

18           (2) **COMPLIANCE WITH REQUIREMENTS.**—If a  
19 State has received funding under this section for the  
20 preceding year, the State must demonstrate, to the  
21 satisfaction of the Secretary, that it complied with  
22 the requirements of subsection (g) in carrying out  
23 the program during that preceding year, and that it  
24 will do so in the future, before it can receive further  
25 funding under this section.

1           (3) FUNDING ALLOCATION.—Except as pro-  
2           vided in subsection (d), each State submitting a pro-  
3           posal that meets the requirements under subsection  
4           (c) shall receive funding under the program based on  
5           the proportion of United States population in the  
6           State according to the 2000 census. In each fiscal  
7           year, the portion of funds attributable under this  
8           paragraph to States that have not submitted pro-  
9           posals that meet the requirements under subsection  
10          (c) in the time and manner specified by the Sec-  
11          retary shall be distributed pro rata to the States  
12          that have submitted proposals that meet the require-  
13          ments under subsection (c) in the specified time and  
14          manner.

15          (d) COMPETITION.—If more than \$80,000,000 is  
16          available for the program under this section for any fiscal  
17          year, the Secretary shall allocate 75 percent of the total  
18          amount of funds available according to subsection (c)(3),  
19          and shall award the remaining 25 percent on a competitive  
20          basis to the States with the proposals the Secretary con-  
21          siders most likely to encourage the widespread adoption  
22          of photovoltaic technologies. In awarding funds under this  
23          subsection, the Secretary may give preference to proposals  
24          that would demonstrate the use of newer materials or  
25          technologies.

1 (e) PROPOSALS.—Not later than 6 months after the  
2 date of enactment of this Act, and in each subsequent fis-  
3 cal year for the life of the program, the Secretary shall  
4 solicit proposals from the States to participate in the pro-  
5 gram under this section.

6 (f) COMPETITIVE CRITERIA.—In awarding funds in  
7 a competitive allocation under subsection (d), the Sec-  
8 retary shall consider—

9 (1) the likelihood of a proposal to encourage the  
10 demonstration of, or lower the costs of, advanced  
11 photovoltaic technologies; and

12 (2) the extent to which a proposal is likely to—

13 (A) maximize the amount of photovoltaics  
14 demonstrated;

15 (B) maximize the proportion of non-Fed-  
16 eral cost share; and

17 (C) limit State administrative costs.

18 (g) STATE PROGRAM.—A program operated by a  
19 State with funding under this section shall provide com-  
20 petitive awards for the demonstration of advanced photo-  
21 voltaic technologies. Each State program shall—

22 (1) require a contribution of at least 60 percent  
23 per award from non-Federal sources, which may in-  
24 clude any combination of State, local, and private

1 funds, except that at least 10 percent of the funding  
2 must be supplied by the State;

3 (2) limit awards for any single project to a  
4 maximum of \$1,000,000;

5 (3) prohibit any nongovernmental recipient  
6 from receiving more than \$1,000,000 per year;

7 (4) endeavor to fund recipients in the commer-  
8 cial, industrial, institutional, governmental, and resi-  
9 dential sectors;

10 (5) limit State administrative costs to no more  
11 than 10 percent of the grant;

12 (6) report annually to the Secretary on—

13 (A) the amount of funds disbursed;

14 (B) the amount of photovoltaics purchased;

15 and

16 (C) the results of the monitoring under  
17 paragraph (7);

18 (7) provide for measurement and verification of  
19 the output of a representative sample of the  
20 photovoltaics systems demonstrated throughout the  
21 average working life of the systems, or at least 20  
22 years;

23 (8) require that applicant buildings must have  
24 received an independent energy efficiency audit dur-

1       ing the 6-month period preceding the filing of the  
2       application; and

3               (9) encourage Historically Black Colleges and  
4       Universities, Hispanic Serving Institutions, and  
5       other minority-serving institutions to apply for  
6       grants under this program.

7       (h) UNEXPENDED FUNDS.—If a State fails to expend  
8       any funds received under subsection (c) or (d) within 3  
9       years of receipt, such remaining funds shall be returned  
10      to the Treasury.

11      (i) REPORTS.—The Secretary shall report to Con-  
12      gress 5 years after funds are first distributed to the States  
13      under this section—

14              (1) the amount of photovoltaics demonstrated;

15              (2) the number of projects undertaken;

16              (3) the administrative costs of the program;

17              (4) the amount of funds that each State has  
18      not received because of a failure to submit a quali-  
19      fying proposal, as described in subsection (c)(3);

20              (5) the results of the monitoring under sub-  
21      section (g)(7); and

22              (6) the total amount of funds distributed, in-  
23      cluding a breakdown by State.

1 (j) AUTHORIZATION OF APPROPRIATIONS.—There  
2 are authorized to be appropriated to the Secretary for the  
3 purposes of carrying out this section—

4 (1) \$50,000,000 for fiscal year 2008; and

5 (2) such sums as may be necessary for each of  
6 the fiscal years 2009 through 2011.

7 **SEC. 10. ENERGY EFFICIENT BUILDING GRANT PROGRAM.**

8 (a) ENERGY EFFICIENT BUILDING PILOT GRANT  
9 PROGRAM.—

10 (1) IN GENERAL.—Not later than 6 months  
11 after the date of enactment of this Act, the Sec-  
12 retary shall establish a pilot program to award  
13 grants to businesses and organizations for new con-  
14 struction of energy efficient buildings, or major ren-  
15 ovations of buildings that will result in energy effi-  
16 cient buildings, to demonstrate innovative energy ef-  
17 ficiency technologies, especially those sponsored by  
18 the Department.

19 (2) AWARDS.—The Secretary shall award  
20 grants under this subsection competitively to those  
21 applicants whose proposals—

22 (A) best demonstrate—

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

1                   (ii) likelihood to maximize cost-effective  
2                   energy efficiency opportunities; and

3                   (iii) advanced energy efficiency technologies; and  
4

5                   (B) maximize the leverage of private investment for costs related to increasing the energy efficiency of the building.  
6  
7

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

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

16                  (5) GRANT PAYMENTS.—

17                         (A) INITIAL PAYMENT.—The Secretary  
18                         shall pay 50 percent of the total amount of the  
19                         grant to grant recipients upon selection.

20                         (B) REMAINDER OF PAYMENT.—The Secretary shall pay the remaining 50 percent of the  
21                         grant only after independent certification, by a  
22                         professional engineer or other qualified professional, that operational buildings are energy efficient buildings as defined in subsection (b).  
23  
24  
25

1           (C) FAILURE TO COMPLY.—The Secretary  
2           shall not provide the remainder of the payment  
3           unless the building is certified within 6 months  
4           after operation of the completed building to  
5           meet the requirements described in subpara-  
6           graph (B), or in the case of major renovations  
7           the building is certified within 6 months of the  
8           completion of the renovations.

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

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

15                 (B) an estimate of aggregate cost and en-  
16                 ergy savings enabled by the pilot program  
17                 under this subsection.

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

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

24                 (1) achieves a reduction in energy consumption  
25                 of—

1           (A) at least 30 percent for new construc-  
2           tion, compared to the energy standards set by  
3           the 2004 International Energy Conservation  
4           Code (in the case of residential buildings) or  
5           ASHRAE Standard 90.1–2004; or

6           (B) at least 20 percent for major renova-  
7           tions, compared to energy consumption before  
8           renovations are begun;

9           (2) is constructed or renovated in accordance  
10          with the most current, appropriate, and applicable  
11          voluntary consensus standards, as determined by the  
12          Secretary, such as those listed in the assessment  
13          under section 914(b), or revised or developed under  
14          section 914(c), of the Energy Policy Act of 2005;  
15          and

16          (3) after construction or renovation—

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

20               (B) if Energy Star standards are not ap-  
21               plicable, uses Federal Energy Management Pro-  
22               gram recommended heating, ventilating, and air  
23               conditioning products.

1 (c) AUTHORIZATION OF APPROPRIATIONS.—There  
2 are authorized to be appropriated to the Secretary for car-  
3 rying out this section—

4 (1) \$10,000,000 for fiscal year 2008; and

5 (2) such sums as may be necessary for each of  
6 the fiscal years 2009 through 2011.

7 **SEC. 11. ENERGY TECHNOLOGY TRANSFER.**

8 Section 917 of the Energy Policy Act of 2005 (42  
9 U.S.C. 16197) is amended to read as follows:

10 **“SEC. 917. ADVANCED ENERGY TECHNOLOGY TRANSFER**  
11 **CENTERS.**

12 “(a) GRANTS.—Not later than 18 months after the  
13 date of enactment of the Alternative Energy Research and  
14 Development Act, the Secretary shall make grants to non-  
15 profit institutions, State and local governments, coopera-  
16 tive extension services, or universities (or consortia there-  
17 of), to establish a geographically dispersed network of Ad-  
18 vanced Energy Technology Transfer Centers, to be located  
19 in areas the Secretary determines have the greatest need  
20 of the services of such Centers. In establishing the net-  
21 work, the Secretary shall consider the special needs and  
22 opportunities for increased energy efficiency for manufac-  
23 tured and site-built housing, including construction, ren-  
24 ovation, and retrofit. In making awards under this section,  
25 the Secretary shall—

1           “(1) give priority to applicants already oper-  
2           ating or partnered with an outreach program capa-  
3           ble of transferring knowledge and information about  
4           advanced energy efficiency methods and tech-  
5           nologies;

6           “(2) ensure that, to the extent practicable, the  
7           program enables the transfer of knowledge and in-  
8           formation—

9                   “(A) about a variety of technologies and

10                   “(B) in a variety of geographic areas; and

11           “(3) give preference to applicants that would  
12           significantly expand on or fill a gap in existing pro-  
13           grams in a geographical region.

14           “(b) ACTIVITIES.—Each Center shall operate a pro-  
15           gram to encourage demonstration and commercial applica-  
16           tion of advanced energy methods and technologies through  
17           education and outreach to building and industrial profes-  
18           sionals, and to other individuals and organizations with  
19           an interest in efficient energy use. Funds awarded under  
20           this section may be used for the following activities:

21                   “(1) Developing and distributing informational  
22                   materials on technologies that could use energy more  
23                   efficiently.

24                   “(2) Carrying out demonstrations of advanced  
25                   energy methods and technologies.

1           “(3) Developing and conducting seminars,  
2           workshops, long-distance learning sessions, and  
3           other activities to aid in the dissemination of knowl-  
4           edge and information on technologies that could use  
5           energy more efficiently.

6           “(4) Providing or coordinating onsite energy  
7           evaluations, including instruction on the commis-  
8           sioning of building heating and cooling systems, for  
9           a wide range of energy end-users.

10           “(5) Examining the energy efficiency needs of  
11           energy end-users to develop recommended research  
12           projects for the Department.

13           “(6) Hiring experts in energy efficient tech-  
14           nologies to carry out activities described in para-  
15           graphs (1) through (5).

16           “(c) APPLICATION.—A person seeking a grant under  
17           this section shall submit to the Secretary an application  
18           in such form and containing such information as the Sec-  
19           retary may require. The Secretary may award a grant  
20           under this section to an entity already in existence if the  
21           entity is otherwise eligible under this section. The applica-  
22           tion shall include, at a minimum—

23           “(1) a description of the applicant’s outreach  
24           program, and the geographic region it would serve,  
25           and of why the program would be capable of trans-

1       ferring knowledge and information about advanced  
2       energy technologies that increase efficiency of energy  
3       use;

4           “(2) a description of the activities the applicant  
5       would carry out, of the technologies that would be  
6       transferred, and of any other organizations that will  
7       help facilitate a regional approach to carrying out  
8       those activities;

9           “(3) a description of how the proposed activities  
10      would be appropriate to the specific energy needs of  
11      the geographic region to be served;

12          “(4) an estimate of the number and types of  
13      energy end-users expected to be reached through  
14      such activities; and

15          “(5) a description of how the applicant will as-  
16      sess the success of the program.

17      “(d) SELECTION CRITERIA.—The Secretary shall  
18      award grants under this section on the basis of the fol-  
19      lowing criteria, at a minimum:

20          “(1) The ability of the applicant to carry out  
21      the proposed activities.

22          “(2) The extent to which the applicant will co-  
23      ordinate the activities of the Center with other enti-  
24      ties as appropriate, such as State and local govern-

1       ments, utilities, universities, and National Labora-  
2       tories.

3               “(3) The appropriateness of the applicant’s out-  
4       reach program for carrying out the program de-  
5       scribed in this section.

6               “(4) The likelihood that proposed activities  
7       could be expanded or used as a model for other  
8       areas.

9               “(e) COST-SHARING.—In carrying out this section,  
10      the Secretary shall require cost-sharing in accordance with  
11      the requirements of section 988 for commercial application  
12      activities.

13              “(f) DURATION.—

14                      “(1) INITIAL GRANT PERIOD.—A grant awarded  
15      under this section shall be for a period of 5 years.

16                      “(2) INITIAL EVALUATION.—Each grantee  
17      under this section shall be evaluated during its third  
18      year of operation under procedures established by  
19      the Secretary to determine if the grantee is accom-  
20      plishing the purposes of this section described in  
21      subsection (a). The Secretary shall terminate any  
22      grant that does not receive a positive evaluation. If  
23      an evaluation is positive, the Secretary may extend  
24      the grant for 3 additional years beyond the original  
25      term of the grant.

1           “(3) ADDITIONAL EXTENSION.—If a grantee re-  
2           ceives an extension under paragraph (2), the grantee  
3           shall be evaluated again during the second year of  
4           the extension. The Secretary shall terminate any  
5           grant that does not receive a positive evaluation. If  
6           an evaluation is positive, the Secretary may extend  
7           the grant for a final additional period of 3 additional  
8           years beyond the original extension.

9           “(4) LIMITATION.—No grantee may receive  
10          more than 11 years of support under this section  
11          without reapplying for support and competing  
12          against all other applicants seeking a grant at that  
13          time.

14          “(g) PROHIBITION.—None of the funds awarded  
15          under this section may be used for the construction of fa-  
16          cilities.

17          “(h) DEFINITIONS.—For purposes of this section:

18                 “(1) ADVANCED ENERGY METHODS AND TECH-  
19                 NOLOGIES.—The term ‘advanced energy methods  
20                 and technologies’ means all methods and tech-  
21                 nologies that promote energy efficiency and con-  
22                 servation, including distributed generation tech-  
23                 nologies, and life-cycle analysis of energy use.

1           “(2) CENTER.—The term ‘Center’ means an  
2           Advanced Energy Technology Transfer Center estab-  
3           lished pursuant to this section.

4           “(3) DISTRIBUTED GENERATION.—The term  
5           ‘distributed generation’ means an electric power gen-  
6           eration technology, including photovoltaic, small  
7           wind and micro-combined heat and power, that is  
8           designed to serve retail electric consumers on-site.

9           “(4) COOPERATIVE EXTENSION.—The term  
10          ‘Cooperative Extension’ means the extension services  
11          established at the land-grant colleges and univer-  
12          sities under the Smith-Lever Act of May 8, 1914.

13          “(5) LAND-GRANT COLLEGES AND UNIVER-  
14          SITIES.—The term ‘land-grant colleges and univer-  
15          sities’ means—

16                 “(A) 1862 Institutions (as defined in sec-  
17                 tion 2 of the Agricultural Research, Extension,  
18                 and Education Reform Act of 1998 (7 U.S.C.  
19                 7601));

20                 “(B) 1890 Institutions (as defined in sec-  
21                 tion 2 of that Act); and

22                 “(C) 1994 Institutions (as defined in sec-  
23                 tion 2 of that Act).

24          “(i) AUTHORIZATION OF APPROPRIATIONS.—In addi-  
25          tion to amounts otherwise authorized to be appropriated

1 in section 911, there are authorized to be appropriated  
2 for the program under this section such sums as may be  
3 appropriated.”.

4 **SEC. 12. GREEN ENERGY EDUCATION.**

5 (a) DEFINITION.—For the purposes of this section:

6 (1) DIRECTOR.—The term “Director” means  
7 the Director of the National Science Foundation.

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

12 (b) GRADUATE TRAINING IN ENERGY RESEARCH  
13 AND DEVELOPMENT.—

14 (1) FUNDING.—In carrying out research, devel-  
15 opment, demonstration, and commercial application  
16 activities authorized for the Department, the Sec-  
17 retary may contribute funds to the National Science  
18 Foundation for the Integrative Graduate Education  
19 and Research Traineeship program to support  
20 projects that enable graduate education related to  
21 such activities.

22 (2) CONSULTATION.—The Director shall con-  
23 sult with the Secretary when preparing solicitations  
24 and awarding grants for projects described in para-  
25 graph (1).

1 (c) CURRICULUM DEVELOPMENT FOR HIGH PER-  
2 FORMANCE BUILDING DESIGN.—

3 (1) FUNDING.—In carrying out advanced en-  
4 ergy technology research, development, demonstra-  
5 tion, and commercial application activities author-  
6 ized for the Department related to high performance  
7 buildings, the Secretary may contribute funds to  
8 curriculum development activities at the National  
9 Science Foundation for the purpose of improving un-  
10 dergraduate or graduate interdisciplinary engineer-  
11 ing and architecture education related to the design  
12 and construction of high performance buildings, in-  
13 cluding development of curricula, of laboratory ac-  
14 tivities, of training practicums, or of design projects.  
15 A primary goal of curriculum development activities  
16 supported under this section shall be to improve the  
17 ability of engineers, architects, and planners to work  
18 together on the incorporation of advanced energy  
19 technologies during the design and construction of  
20 high performance buildings.

21 (2) CONSULTATION.—The Director shall con-  
22 sult with the Secretary when preparing solicitations  
23 and awarding grants for projects described in para-  
24 graph (1).

1           (3) PRIORITY.—In awarding grants with re-  
2           spect to which the Secretary has contributed funds  
3           under this subsection, the Director shall give priority  
4           to applications from departments, programs, or cen-  
5           ters of a school of engineering that are partnered  
6           with schools, departments, or programs of design,  
7           architecture, and city, regional, or urban planning,  
8           and due consideration to applications from Histori-  
9           cally Black Colleges and Universities and other mi-  
10          nority serving institutions.

11 **SEC. 13. ARPA-E STUDY.**

12          (a) IN GENERAL.—The Secretary shall enter into an  
13          arrangement with the National Academy of Sciences to  
14          conduct a detailed study of, and make further rec-  
15          ommendations on, the October 2005 National Academy of  
16          Sciences recommendation to establish an Advanced Re-  
17          search Projects Agency-Energy (in this section referred to  
18          as ARPA-E).

19          (b) REPORT.—Not later than 12 months after the  
20          date of enactment of this Act, the Secretary shall transmit  
21          to Congress the study described in subsection (a) and the  
22          Secretary's response to the findings, conclusions, and rec-  
23          ommendations of that study.

1           (c) TERMS OF REFERENCE.—The Secretary shall en-  
2 sure that the study described in subsection (a) addresses  
3 the following questions:

4           (1) What basic research related to new energy  
5 technologies is occurring now, what entities are  
6 funding it, and what is preventing the results of that  
7 research from reaching the market?

8           (2) What economic evidence indicates that the  
9 limiting factor in the market penetration of new en-  
10 ergy technologies is a lack of basic research on path-  
11 breaking new technologies? What barriers do those  
12 trying to develop new energy technologies face dur-  
13 ing later stages of research and development?

14           (3) To what extent is the Defense Advanced  
15 Research Projects Agency an appropriate model for  
16 an energy research agency, given that the Federal  
17 Government would not be the primary customer for  
18 its technology and where cost is an important con-  
19 cern?

20           (4) How would research and development spon-  
21 sored by ARPA-E differ from research and develop-  
22 ment conducted by the National Laboratories or  
23 sponsored by the Department through the Office of  
24 Science, the Office of Energy Efficiency and Renew-  
25 able Energy, the Office of Fossil Energy, the Office

1 of Electricity Delivery and Energy Reliability, and  
2 the Office of Nuclear Energy?

3 (5) Should industry or National Laboratories be  
4 recipients of ARPA-E grants? What institutional or  
5 organizational arrangements would be required to  
6 ensure that ARPA-E sponsors transformational,  
7 rather than incremental, research and development?

8 **SEC. 14. COAL METHANATION.**

9 (a) PROGRAM.—The Secretary shall establish a pro-  
10 gram of research, development, demonstration, and com-  
11 mercial application of coal gasification facilities that con-  
12 vert coal into pipeline quality gaseous fuels for direct use  
13 or subsequent chemical or physical conversion.

14 (b) PROCEDURES.—The program established under  
15 subsection (a) shall be carried out using procedures de-  
16 scribed in title XVII of the Energy Policy Act of 2005.

17 **SEC. 15. ALTERNATIVE BIOBASED FUELS AND ULTRA LOW**  
18 **SULFUR DIESEL.**

19 (a) ALTERNATIVE FUEL AND ULSD INFRASTRUC-  
20 TURE AND ADDITIVES RESEARCH AND DEVELOPMENT.—  
21 The Secretary, in consultation with the National Institute  
22 of Standards and Technology, shall carry out a program  
23 of research, development, demonstration, and commercial  
24 application of materials to be added to alternative  
25 biobased fuels and Ultra Low Sulfur Diesel fuels to make

1 them more compatible with existing infrastructure used to  
2 store and deliver petroleum-based fuels to the point of  
3 final sale. The program shall address—

4 (1) materials to prevent or mitigate—

5 (A) corrosion of metal, plastic, rubber,  
6 cork, fiberglass, glues, or any other material  
7 used in pipes and storage tanks;

8 (B) dissolving of storage tank sediments;

9 (C) clogging of filters;

10 (D) contamination from water or other  
11 adulterants or pollutants;

12 (E) poor flow properties related to low  
13 temperatures;

14 (F) oxidative and thermal instability in  
15 long-term storage and use;

16 (G) increased volatile emissions;

17 (H) microbial contamination;

18 (I) problems associated with electrical con-  
19 ductivity; and

20 (J) increased nitrogen oxide emissions;

21 (2) alternatives to conventional methods for re-  
22 furbishment and cleaning of gasoline and diesel  
23 tanks, including tank lining applications; and

1           (3) other problems as identified by the Sec-  
2           retary in consultation with the National Institute of  
3           Standards and Technology.

4           (b) SULFUR TESTING FOR DIESEL FUELS.—

5           (1) PROGRAM.—The Secretary, in consultation  
6           with the National Institute of Standards and Tech-  
7           nology, shall carry out a research, development, and  
8           demonstration program on portable, low-cost, and  
9           accurate methods and technologies for testing of sul-  
10          fur content in fuel, including Ultra Low Sulfur Die-  
11          sel and Low Sulfur Diesel.

12          (2) SCHEDULE OF DEMONSTRATIONS.—Not  
13          later than 1 year after the date of enactment of this  
14          Act, the Secretary shall begin demonstrations of  
15          technologies under paragraph (1).

16          (c) STANDARD REFERENCE MATERIALS AND DATA  
17          BASE DEVELOPMENT.—Not later than 6 months after the  
18          date of enactment of this Act, the National Institute of  
19          Standards and Technology shall develop a physical prop-  
20          erties data base and standard reference materials for al-  
21          ternative fuels. Such data base and standard reference  
22          materials shall be maintained and updated as appropriate  
23          as additional alternative fuels become available.

1 **SEC. 16. BIOENERGY.**

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

5 (1) in subsection (c)(1), by inserting “, includ-  
6 ing \$25,000,000 for section 932(d)(1)(B)(v)” after  
7 “section 932(d)”;

8 (2) in subsection (c)(2), by inserting “, includ-  
9 ing \$25,000,000 for section 932(d)(1)(B)(v)” after  
10 “section 932(d)”; and

11 (3) in subsection (c)(3), by inserting “, includ-  
12 ing \$25,000,000 for section 932(d)(1)(B)(v)” after  
13 “section 932(d)”.

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

17 (1) by striking “and” at the end of clause (iii);  
18 and

19 (2) by adding after clause (iv) the following new  
20 clause:

