

TITLE IX—RESEARCH AND DEVELOPMENT

- Sec. 901. Short title.
- Sec. 902. Goals.
- Sec. 903. Definitions.

Subtitle A—Energy Efficiency

- Sec. 911. Energy efficiency.
- Sec. 912. Next Generation Lighting Initiative.
- Sec. 913. National Building Performance Initiative.
- Sec. 914. Secondary electric vehicle battery use program.
- Sec. 915. Energy Efficiency Science Initiative.

Subtitle B—Distributed Energy and Electric Energy Systems

- Sec. 921. Distributed energy and electric energy systems.
- Sec. 922. High power density industry program.
- Sec. 923. Micro-cogeneration energy technology.
- Sec. 924. Distributed energy technology demonstration program.
- Sec. 925. Electric transmission and distribution programs.

Subtitle C—Renewable Energy

- Sec. 931. Renewable energy.
- Sec. 932. Bioenergy program.
- Sec. 933. Concentrating solar power research program.
- Sec. 934. Hybrid solar lighting research and development program.
- Sec. 935. Miscellaneous projects.

Subtitle D—Nuclear Energy

- Sec. 941. Nuclear energy.
- Sec. 942. Nuclear energy research programs.
- Sec. 943. Advanced fuel cycle initiative.
- Sec. 944. Nuclear science and engineering support for institutions of higher education.
- Sec. 945. Security of nuclear facilities.
- Sec. 946. Alternatives to industrial radioactive sources.

Subtitle E—Fossil Energy

- Sec. 951. Fossil energy.
- Sec. 952. Oil and gas research programs.
- Sec. 953. Methane hydrate research.
- Sec. 954. Research and development for coal mining technologies.
- Sec. 955. Coal and related technologies program.
- Sec. 956. Carbon dioxide capture research and development.
- Sec. 957. Complex well technology testing facility.

Subtitle F—Science

- Sec. 961. Science.
- Sec. 962. Fusion energy sciences program.
- Sec. 963. Support for science and energy facilities and infrastructure.
- Sec. 964. Catalysis research program.
- Sec. 965. Hydrogen.
- Sec. 966. Solid state lighting.

Sec. 967. Advanced scientific computing for energy missions.
Sec. 968. Genomes to Life Program.
Sec. 969. Fission and fusion energy materials research program.
Sec. 970. Energy-Water Supply Technologies Program.
Sec. 971. Spallation neutron source.

Subtitle G—Energy and Environment

Sec. 981. Western Hemisphere energy cooperation.

1 **TITLE IX—RESEARCH AND**
2 **DEVELOPMENT**

3 **SEC. 901. SHORT TITLE.**

4 This title may be cited as the “Energy Research, De-
5 velopment, Demonstration, and Commercial Application
6 Act of 2005”.

7 **SEC. 902. GOALS.**

8 (a) IN GENERAL.—In order to achieve the purposes
9 of this title, the Secretary shall conduct a balanced set
10 of programs of energy research, development, demonstra-
11 tion, and commercial application focused on—

12 (1) increasing the efficiency of all energy inten-
13 sive sectors through conservation and improved tech-
14 nologies;

15 (2) promoting diversity of energy supply;

16 (3) decreasing the dependence of the United
17 States on foreign energy supplies;

18 (4) improving the energy security of the United
19 States; and

20 (5) decreasing the environmental impact of en-
21 ergy-related activities.

1 (b) GOALS.—The Secretary shall publish measurable
2 cost and performance-based goals with each annual budget
3 submission in at least the following areas:

4 (1) Energy efficiency for buildings, energy-con-
5 suming industries, and vehicles.

6 (2) Electric energy generation (including dis-
7 tributed generation), transmission, and storage.

8 (3) Renewable energy technologies, including
9 wind power, photovoltaics, solar thermal systems,
10 geothermal energy, hydrogen-fueled systems, bio-
11 mass-based systems, biofuels, and hydropower.

12 (4) Fossil energy, including power generation,
13 onshore and offshore oil and gas resource recovery,
14 and transportation.

15 (5) Nuclear energy, including programs for ex-
16 isting and advanced reactors, and education of fu-
17 ture specialists.

18 (c) PUBLIC COMMENT.—The Secretary shall provide
19 mechanisms for input on the annually published goals
20 from industry, institutions of higher education, and other
21 public sources.

22 (d) EFFECT OF GOALS.—Nothing in subsection (a)
23 or the annually published goals creates any new authority
24 for any Federal agency, or may be used by any Federal

1 agency, to support the establishment of regulatory stand-
2 ards or regulatory requirements.

3 **SEC. 903. DEFINITIONS.**

4 In this title:

5 (1) DEPARTMENTAL MISSION.—The term “de-
6 partmental mission” means any of the functions
7 vested in the Secretary by the Department of En-
8 ergy Organization Act (42 U.S.C. 7101 et seq.) or
9 other law.

10 (2) HISPANIC-SERVING INSTITUTION.—The
11 term “Hispanic-serving institution” has the meaning
12 given the term in section 502(a) of the Higher Edu-
13 cation Act of 1965 (20 U.S.C. 1101a(a)).

14 (3) NONMILITARY ENERGY LABORATORY.—The
15 term “nonmilitary energy laboratory” means a Na-
16 tional Laboratory other than a National Laboratory
17 listed in subparagraph (G), (H), or (N) of [section
18 3(3)].

19 (4) PART B INSTITUTION.—The term “part B
20 institution” has the meaning given the term in sec-
21 tion 322 of the Higher Education Act of 1965 (20
22 U.S.C. 1061).

23 (5) SINGLE-PURPOSE RESEARCH FACILITY.—
24 The term “single-purpose research facility” means—

1 (A) any of the primarily single-purpose en-
2 tities owned by the Department; or

3 (B) any other organization of the Depart-
4 ment designated by the Secretary.

5 **Subtitle A—Energy Efficiency**

6 **SEC. 911. ENERGY EFFICIENCY.**

7 (a) IN GENERAL.—There are authorized to be appro-
8 priated to the Secretary to carry out energy efficiency and
9 conservation research, development, demonstration, and
10 commercial application activities, including activities au-
11 thorized under this subtitle—

12 (1) \$772,000,000 for fiscal year 2006;

13 (2) \$865,000,000 for fiscal year 2007; and

14 (3) \$920,000,000 for fiscal year 2008.

15 (b) ALLOCATIONS.—From amounts authorized under
16 subsection (a), the following sums are authorized:

17 (1) For activities under section 912,
18 \$50,000,000 for each of fiscal years 2006 through
19 2008.

20 (2) For activities under section 914,
21 \$7,000,000 for each of fiscal years 2006 through
22 2008.

23 (3) For activities under section 915—

24 (A) \$30,000,000 for fiscal year 2006;

25 (B) \$35,000,000 for fiscal year 2007; and

1 (C) \$40,000,000 for fiscal year 2008.

2 (c) EXTENDED AUTHORIZATION.—There are author-
3 ized to be appropriated to the Secretary to carry out sec-
4 tion 912 \$50,000,000 for each of fiscal years 2009
5 through 2013.

6 (d) LIMITATIONS.—None of the funds authorized to
7 be appropriated under this section may be used for—

8 (1) the issuance or implementation of energy ef-
9 ficiency regulations;

10 (2) the weatherization program established
11 under part A of title IV of the Energy Conservation
12 and Production Act (42 U.S.C. 6861 et seq.);

13 (3) a State energy conservation plan established
14 under part D of title III of the Energy Policy and
15 Conservation Act (42 U.S.C. 6321 et seq.); or

16 (4) a Federal energy management measure car-
17 ried out under part 3 of title V of the National En-
18 ergy Conservation Policy Act (42 U.S.C. 8251 et
19 seq.).

20 **SEC. 912. NEXT GENERATION LIGHTING INITIATIVE.**

21 (a) DEFINITIONS.—In this section:

22 (1) ADVANCED SOLID-STATE LIGHTING.—The
23 term “advanced solid-state lighting” means a
24 semiconducting device package and delivery system

1 that produces white light using externally applied
2 voltage.

3 (2) INDUSTRY ALLIANCE.—The term “Industry
4 Alliance” means an entity selected by the Secretary
5 under subsection (d).

6 (3) INITIATIVE.—The term “Initiative” means
7 the Next Generation Lighting Initiative carried out
8 under this section.

9 (4) RESEARCH.—The term “research” includes
10 basic research on the technologies, materials, and
11 manufacturing processes required for white light
12 emitting diodes.

13 (5) WHITE LIGHT EMITTING DIODE.—The term
14 “white light emitting diode” means a
15 semiconducting package, using either organic or in-
16 organic materials, that produces white light using
17 externally applied voltage.

18 (b) INITIATIVE.—The Secretary shall carry out a
19 Next Generation Lighting Initiative in accordance with
20 this section to support research, development, demonstra-
21 tion, and commercial application activities related to ad-
22 vanced solid-state lighting technologies based on white
23 light emitting diodes.

24 (c) OBJECTIVES.—The objectives of the Initiative
25 shall be to develop advanced solid-state organic and inor-

1 ganic lighting technologies based on white light emitting
2 diodes that, compared to incandescent and fluorescent
3 lighting technologies, are longer lasting, are more energy-
4 efficient and cost-competitive, and have less environmental
5 impact.

6 (d) INDUSTRY ALLIANCE.—Not later than 90 days
7 after the date of enactment of this Act, the Secretary shall
8 competitively select an Industry Alliance to represent par-
9 ticipants who are private, for-profit firms that, as a group,
10 are broadly representative of United States solid state
11 lighting research, development, infrastructure, and manu-
12 facturing expertise as a whole.

13 (e) RESEARCH.—

14 (1) GRANTS.—The Secretary shall carry out the
15 research activities of the Initiative through competi-
16 tively awarded grants to—

17 (A) researchers, including Industry Alli-
18 ance participants;

19 (B) National Laboratories; and

20 (C) institutions of higher education.

21 (2) INDUSTRY ALLIANCE.—The Secretary shall
22 annually solicit from the Industry Alliance—

23 (A) comments to identify solid-state light-
24 ing technology needs;

1 (B) an assessment of the progress of the
2 research activities of the Initiative; and

3 (C) assistance in annually updating solid-
4 state lighting technology roadmaps.

5 (3) AVAILABILITY TO PUBLIC.—The informa-
6 tion and roadmaps under paragraph (2) shall be
7 available to the public.

8 (f) DEVELOPMENT, DEMONSTRATION, AND COMMER-
9 CIAL APPLICATION.—

10 (1) IN GENERAL.—The Secretary shall carry
11 out a development, demonstration, and commercial
12 application program for the Initiative through com-
13 petitively selected awards.

14 (2) PREFERENCE.—In making the awards, the
15 Secretary may give preference to participants in the
16 Industry Alliance.

17 (g) COST SHARING.—In carrying out this section, the
18 Secretary shall require cost sharing in accordance with
19 section 1002.

20 (h) INTELLECTUAL PROPERTY.—The Secretary may
21 require (in accordance with section 202(a)(ii) of title 35,
22 United States Code, section 152 of the Atomic Energy Act
23 of 1954 (42 U.S.C. 2182), and section 9 of the Federal
24 Nonnuclear Energy Research and Development Act of

1 1974 (42 U.S.C. 5908)) that for any new invention devel-
2 oped under subsection (e)—

3 (1) that the Industry Alliance participants who
4 are active participants in research, development, and
5 demonstration activities related to the advanced
6 solid-state lighting technologies that are covered by
7 this section shall be granted the first option to nego-
8 tiate with the invention owner, at least in the field
9 of solid-state lighting, nonexclusive licenses and roy-
10 alties on terms that are reasonable under the cir-
11 cumstances;

12 (2) that the invention owner must offer to nego-
13 tiate licenses with the Industry Alliance participants
14 described in paragraph (1), in good faith, for at
15 least 1 year after United States patents are issued
16 on any such new invention; and

17 (3) such other terms as the Secretary deter-
18 mines are required to promote accelerated commer-
19 cialization of inventions made under the Initiative.

20 (i) NATIONAL ACADEMY REVIEW.—The Secretary
21 shall enter into an arrangement with the National Acad-
22 emy of Sciences to conduct periodic reviews of the Initia-
23 tive.

24 **SEC. 913. NATIONAL BUILDING PERFORMANCE INITIATIVE.**

25 (a) INTERAGENCY GROUP.—

1 (1) IN GENERAL.—Not later than 90 days after
2 the date of enactment of this Act, the Director of
3 the Office of Science and Technology Policy shall es-
4 tablish an interagency group to develop, in coordina-
5 tion with the advisory committee established under
6 subsection (e), a National Building Performance Ini-
7 tiative (referred to in this section as the “Initia-
8 tive”).

9 (2) COCHAIRS.—The interagency group shall be
10 co-chaired by appropriate officials of the Depart-
11 ment and the Department of Commerce, who shall
12 jointly arrange for the provision of necessary admin-
13 istrative support to the group.

14 (b) INTEGRATION OF EFFORTS.—The Initiative shall
15 integrate Federal, State, and voluntary private sector ef-
16 forts to reduce the costs of construction, operation, main-
17 tenance, and renovation of commercial, industrial, institu-
18 tional, and residential buildings.

19 (c) PLAN.—

20 (1) IN GENERAL.—Not later than 1 year after
21 the date of enactment of this Act, the interagency
22 group shall submit to Congress a plan for carrying
23 out the appropriate Federal role in the Initiative.

24 (2) INCLUSIONS.—The plan shall include—

1 (A) research, development, demonstration,
2 and commercial application of systems and ma-
3 terials for new construction and retrofit relating
4 to the building envelope and building system
5 components; and

6 (B) the collection, analysis, and dissemina-
7 tion of research results and other pertinent in-
8 formation on enhancing building performance to
9 industry, government entities, and the public.

10 (d) DEPARTMENT OF ENERGY ROLE.—Within the
11 Federal portion of the Initiative, the Department shall be
12 the lead agency for all aspects of building performance re-
13 lated to use and conservation of energy.

14 (e) ADVISORY COMMITTEE.—The Director of the Of-
15 fice of Science and Technology Policy shall establish an
16 advisory committee to—

17 (1) analyze and provide recommendations on
18 potential private sector roles and participation in the
19 Initiative; and

20 (2) review and provide recommendations on the
21 plan described in subsection (c).

22 (f) ADMINISTRATION.—Nothing in this section pro-
23 vides any Federal agency with new authority to regulate
24 building performance.

1 **SEC. 914. SECONDARY ELECTRIC VEHICLE BATTERY USE**
2 **PROGRAM.**

3 (a) DEFINITIONS.—In this section:

4 (1) BATTERY.—The term “battery” means an
5 energy storage device that previously has been used
6 to provide motive power in a vehicle powered in
7 whole or in part by electricity.

8 (2) ASSOCIATED EQUIPMENT.—The term “asso-
9 ciated equipment” means equipment located where
10 the batteries will be used that is necessary to enable
11 the use of the energy stored in the batteries.

12 (b) PROGRAM.—

13 (1) IN GENERAL.—The Secretary shall establish
14 and conduct a research, development, demonstration,
15 and commercial application program for the sec-
16 ondary use of batteries.

17 (2) ADMINISTRATION.—The program shall be—

18 (A) designed to demonstrate the use of
19 batteries in secondary applications, including
20 utility and commercial power storage and power
21 quality;

22 (B) structured to evaluate the perform-
23 ance, including useful service life and costs, of
24 such batteries in field operations, and the nec-
25 essary supporting infrastructure, including
26 reuse and disposal of batteries; and

1 (C) coordinated with ongoing secondary
2 battery use programs at the National Labora-
3 tories and in industry.

4 (c) SOLICITATION.—

5 (1) IN GENERAL.—Not later than 180 days
6 after the date of enactment of this Act, the Sec-
7 retary shall solicit proposals to demonstrate the sec-
8 ondary use of batteries and associated equipment
9 and supporting infrastructure in geographic loca-
10 tions throughout the United States.

11 (2) ADDITIONAL SOLICITATIONS.—The Sec-
12 retary may make additional solicitations for pro-
13 posals if the Secretary determines that the solicita-
14 tions are necessary to carry out this section.

15 (d) SELECTION OF PROPOSALS.—

16 (1) IN GENERAL.—Not later than 90 days after
17 the closing date established by the Secretary for re-
18 ceipt of proposals under subsection (c), the Sec-
19 retary shall select up to 5 proposals that may receive
20 financial assistance under this section once the De-
21 partment receives appropriated funds to carry out
22 this section.

23 (2) FACTORS.—In selecting proposals, the Sec-
24 retary shall consider—

25 (A) the diversity of battery type;

1 (B) geographic and climatic diversity; and

2 (C) life-cycle environmental effects of the

3 approaches.

4 (3) LIMITATION.—No 1 project selected under
5 this section shall receive more than 25 percent of the
6 funds made available to carry out the program
7 under this section.

8 (4) NONFEDERAL INVOLVEMENT.—In selecting
9 proposals, the Secretary shall consider the extent of
10 involvement of State or local government and other
11 persons in each demonstration project to optimize
12 use of Federal resources.

13 (5) OTHER CRITERIA.—In selecting proposals,
14 the Secretary may consider such other criteria as the
15 Secretary considers appropriate.

16 (e) CONDITIONS.—In carrying out this section, the
17 Secretary shall require that—

18 (1) relevant information be provided to—

19 (A) the Department;

20 (B) the users of the batteries;

21 (C) the proposers of a project under this
22 section; and

23 (D) the battery manufacturers; and

1 (2) the costs of carrying out projects and activi-
2 ties under this section are shared in accordance with
3 section [1002].

4 **SEC. 915. ENERGY EFFICIENCY SCIENCE INITIATIVE.**

5 (a) ESTABLISHMENT.—The Secretary shall establish
6 an Energy Efficiency Science Initiative to be managed by
7 the Assistant Secretary in the Department with responsi-
8 bility for energy conservation under section 203(a)(9) of
9 the Department of Energy Organization Act (42 U.S.C.
10 7133(a)(9)), in consultation with the Director of the Of-
11 fice of Science, for grants to be competitively awarded and
12 subject to peer review for research relating to energy effi-
13 ciency.

14 (b) REPORT.—The Secretary shall submit to Con-
15 gress, along with the annual budget request of the Presi-
16 dent submitted to Congress, a report on the activities of
17 the Energy Efficiency Science Initiative, including a de-
18 scription of the process used to award the funds and an
19 explanation of how the research relates to energy effi-
20 ciency.

21 **Subtitle B—Distributed Energy and**
22 **Electric Energy Systems**

23 **SEC. 921. DISTRIBUTED ENERGY AND ELECTRIC ENERGY**
24 **SYSTEMS.**

25 (a) IN GENERAL.—

1 (1) DISTRIBUTED ENERGY AND ELECTRIC EN-
2 ERGY SYSTEMS ACTIVITIES.—There are authorized
3 to be appropriated to the Secretary to carry out dis-
4 tributed energy and electric energy systems activi-
5 ties, including activities authorized under this
6 subtitle—

7 (A) \$220,000,000 for fiscal year 2006;

8 (B) \$240,000,000 for fiscal year 2007; and

9 (C) \$260,000,000 for fiscal year 2008.

10 (2) POWER DELIVERY RESEARCH INITIATIVE.—

11 There are authorized to be appropriated to the Sec-
12 retary to carry out the Policy Delivery Research Ini-
13 tiative under subsection 925(e)—

14 (A) \$30,000,000 for fiscal year 2006;

15 (B) \$35,000,000 for fiscal year 2007; and

16 (C) \$40,000,000 for fiscal year 2008.

17 (b) MICRO-COGENERATION ENERGY TECH-

18 NOLOGY.—From amounts authorized under subsection

19 (a), \$20,000,000 for each of fiscal years 2006 and 2007

20 shall be available to carry out activities under section 924.

21 **SEC. 922. HIGH POWER DENSITY INDUSTRY PROGRAM.**

22 (a) IN GENERAL.—The Secretary shall establish a

23 comprehensive research, development, demonstration, and

24 commercial application program to improve the energy ef-

1 efficiency of high power density facilities, including data
2 centers, server farms, and telecommunications facilities.

3 (b) TECHNOLOGIES.—The program shall consider
4 technologies that provide significant improvement in ther-
5 mal controls, metering, load management, peak load re-
6 duction, or the efficient cooling of electronics.

7 **SEC. 923. MICRO-COGENERATION ENERGY TECHNOLOGY.**

8 (a) IN GENERAL.—The Secretary shall make com-
9 petitive, merit-based grants to consortia for the develop-
10 ment of micro-cogeneration energy technology.

11 (b) USES.—The consortia shall explore—

12 (1) the use of small-scale combined heat and
13 power in residential heating appliances;

14 (2) the use of excess power to operate other ap-
15 pliances within the residence; and

16 (3) the supply of excess generated power to the
17 power grid.

18 **SEC. 924. DISTRIBUTED ENERGY TECHNOLOGY DEM-**
19 **ONSTRATION PROGRAM.**

20 The Secretary may provide financial assistance to co-
21 ordinating consortia of interdisciplinary participants for
22 demonstrations designed to accelerate the use of distrib-
23 uted energy technologies (such as fuel cells, microturbines,
24 reciprocating engines, thermally activated technologies,

1 and combined heat and power systems) in highly energy
2 intensive commercial applications.

3 **SEC. 925. ELECTRIC TRANSMISSION AND DISTRIBUTION**
4 **PROGRAMS.**

5 (a) DEMONSTRATION PROGRAM.—The Secretary
6 shall establish a comprehensive research, development,
7 and demonstration program to ensure the reliability, effi-
8 ciency, and environmental integrity of electrical trans-
9 mission and distribution systems, which shall include—

10 (1) advanced energy and energy storage tech-
11 nologies, materials, and systems, giving priority to
12 new transmission technologies, including composite
13 conductor materials and other technologies that en-
14 hance reliability, operational flexibility, or power-car-
15 rying capability;

16 (2) advanced grid reliability and efficiency tech-
17 nology development;

18 (3) technologies contributing to significant load
19 reductions;

20 (4) advanced metering, load management, and
21 control technologies;

22 (5) technologies to enhance existing grid compo-
23 nents;

24 (6) the development and use of high-tempera-
25 ture superconductors to—

1 (A) enhance the reliability, operational
2 flexibility, or power-carrying capability of elec-
3 tric transmission or distribution systems; or

4 (B) increase the efficiency of electric en-
5 ergy generation, transmission, distribution, or
6 storage systems;

7 (7) integration of power systems, including sys-
8 tems to deliver high-quality electric power, electric
9 power reliability, and combined heat and power;

10 (8) supply of electricity to the power grid by
11 small scale, distributed and residential-based power
12 generators;

13 (9) the development and use of advanced grid
14 design, operation, and planning tools;

15 (10) any other infrastructure technologies, as
16 appropriate; and

17 (11) technology transfer and education.

18 (b) PROGRAM PLAN.—

19 (1) IN GENERAL.—Not later than 1 year after
20 the date of enactment of this Act, the Secretary, in
21 consultation with other appropriate Federal agen-
22 cies, shall prepare and submit to Congress a 5-year
23 program plan to guide activities under this section.

24 (2) CONSULTATION.—In preparing the program
25 plan, the Secretary shall consult with—

- 1 (A) utilities;
- 2 (B) energy service providers;
- 3 (C) manufacturers;
- 4 (D) institutions of higher education;
- 5 (E) other appropriate State and local
- 6 agencies;
- 7 (F) environmental organizations;
- 8 (G) professional and technical societies;
- 9 and
- 10 (H) any other persons the Secretary con-
- 11 siders appropriate.

12 (c) IMPLEMENTATION.—The Secretary shall consider

13 implementing the program under this section using a con-

14 sortium of participants from industry, institutions of high-

15 er education, and National Laboratories.

16 (d) REPORT.—Not later than 2 years after the sub-

17 mission of the plan under subsection (b), the Secretary

18 shall submit to Congress a report—

19 (1) describing the progress made under this

20 section; and

21 (2) identifying any additional resources needed

22 to continue the development and commercial applica-

23 tion of transmission and distribution of infrastruc-

24 ture technologies.

25 (e) POWER DELIVERY RESEARCH INITIATIVE.—

1 (1) IN GENERAL.—The Secretary shall establish
2 a research, development, and demonstration initia-
3 tive specifically focused on power delivery using com-
4 ponents incorporating high temperature super-
5 conductivity.

6 (2) GOALS.—The goals of the Initiative shall
7 be—

8 (A) to establish world-class facilities to de-
9 velop high temperature superconductivity power
10 applications in partnership with manufacturers
11 and utilities;

12 (B) to provide technical leadership for es-
13 tablishing reliability for high temperature
14 superconductivity power applications, including
15 suitable modeling and analysis;

16 (C) to facilitate the commercial transition
17 toward direct current power transmission, stor-
18 age, and use for high power systems using high
19 temperature superconductivity; and

20 (D) to facilitate the integration of very low
21 impedance high temperature superconducting
22 wires and cables in existing electric networks to
23 improve system performance, power flow con-
24 trol, and reliability.

25 (3) INCLUSIONS.—The Initiative shall include—

1 (A) feasibility analysis, planning, research,
2 and design to construct demonstrations of
3 superconducting links in high power, direct cur-
4 rent, and controllable alternating current trans-
5 mission systems;

6 (B) public-private partnerships to dem-
7 onstrate deployment of high temperature super-
8 conducting cable into testbeds simulating a re-
9 alistic transmission grid and under varying
10 transmission conditions, including actual grid
11 insertions; and

12 (C) testbeds developed in cooperation with
13 National Laboratories, industries, and institu-
14 tions of higher education to—

15 (i) demonstrate those technologies;

16 (ii) prepare the technologies for com-
17 mercial introduction; and

18 (iii) address cost or performance road-
19 blocks to successful commercial use.

20 (f) TRANSMISSION AND DISTRIBUTION GRID PLAN-
21 NING AND OPERATIONS INITIATIVE.—

22 (1) IN GENERAL.—The Secretary shall establish
23 a research, development, and demonstration initia-
24 tive specifically focused on tools needed to plan, op-
25 erate, and expand the transmission and distribution

1 grids in the presence of competitive market mecha-
2 nisms for energy, load demand, customer response,
3 and ancillary services.

4 (2) GOALS.—The goals of the Initiative shall
5 be—

6 (A)(i) to develop and use a geographically
7 distributed center, consisting of institutions of
8 higher education, and National Laboratories,
9 with expertise and facilities to develop the un-
10 derlying theory and software for power system
11 application; and

12 (ii) to ensure commercial development in
13 partnership with software vendors and utilities;

14 (B) to provide technical leadership in engi-
15 neering and economic analysis for the reliability
16 and efficiency of power systems planning and
17 operations in the presence of competitive mar-
18 kets for electricity;

19 (C) to model, simulate, and experiment
20 with new market mechanisms and operating
21 practices to understand and optimize those new
22 methods before actual use; and

23 (D) to provide technical support and tech-
24 nology transfer to electric utilities and other

1 participants in the domestic electric industry
2 and marketplace.

3 **Subtitle C—Renewable Energy**

4 **SEC. 931. RENEWABLE ENERGY.**

5 (a) IN GENERAL.—There are authorized to be appro-
6 priated to the Secretary to carry out renewable energy re-
7 search, development, demonstration, and commercial ap-
8 plication activities, including activities authorized under
9 this subtitle—

10 (1) \$610,000,000 for fiscal year 2006;

11 (2) \$659,000,000 for fiscal year 2007; and

12 (3) \$710,000,000 for fiscal year 2008.

13 (b) BIOENERGY.—From the amounts authorized
14 under subsection (a), there are authorized to be appro-
15 priated to carry out section 932—

16 (1) \$167,650,000 for fiscal year 2006;

17 (2) \$180,000,000 for fiscal year 2007; and

18 (3) \$192,000,000 for fiscal year 2008.

19 (c) CONCENTRATING SOLAR POWER.—From
20 amounts authorized under subsection (a), there is author-
21 ized to be appropriated to carry out section 933
22 \$50,000,000 for each of fiscal years 2006 through 2008.

23 (d) ADMINISTRATION.—Of the funds authorized
24 under subsection (b), not less than \$5,000,000 for each
25 fiscal year shall be made available for grants to—

1 (1) part B institutions;

2 (2) Tribal Colleges or Universities (as defined
3 in section 316(b) of the Higher Education Act of
4 1965 (20 U.S.C. 1059c(b))); and

5 (3) Hispanic-serving institutions.

6 (e) CONSULTATION.—In carrying out this section, the
7 Secretary, in consultation with the Secretary of Agri-
8 culture, shall demonstrate the use of—

9 (1) advanced wind power technology, including
10 combined use with coal gasification;

11 (2) biomass;

12 (3) geothermal energy systems; and

13 (4) other renewable energy technologies to as-
14 sist in delivering electricity to rural and remote loca-
15 tions.

16 **SEC. 932. BIOENERGY PROGRAM.**

17 (a) DEFINITION OF CELLULOSIC FEEDSTOCK.—In
18 this section, the term “cellulosic feedstock” means any
19 portion of a crop not normally used in food production
20 or any nonfood crop grown for the purpose of producing
21 biomass feedstock.

22 (b) PROGRAM.—The Secretary shall conduct a pro-
23 gram of research, development, demonstration, and com-
24 mercial application for bioenergy, including—

25 (1) biopower energy systems;

1 (2) biofuels;

2 (3) bioproducts;

3 (4) integrated biorefineries that may produce
4 biopower, biofuels, and bioproducts;

5 (5) cogeneration of solar thermal electric power
6 and photosynthetic-based hydrogen production;

7 (6) cross-cutting research and development in
8 feedstocks; and

9 (7) economic analysis.

10 (c) **BIOFUELS AND BIOPRODUCTS.**—The goals of the
11 biofuels and bioproducts programs shall be to develop, in
12 partnership with industry—

13 (1) advanced biochemical and thermochemical
14 conversion technologies capable of making fuels from
15 cellulosic feedstocks that are price-competitive with
16 gasoline or diesel in either internal combustion en-
17 gines or fuel cell-powered vehicles; and

18 (2) advanced biotechnology processes capable of
19 making biofuels and bioproducts with emphasis on
20 development of biorefinery technologies using en-
21 zyme-based processing systems.

22 (d) **REPEAL OF SUNSET PROVISION.**—Section 311 of
23 the Biomass Research and Development Act of 2000 (7
24 U.S.C. 8101 note) is repealed.

1 **SEC. 933. CONCENTRATING SOLAR POWER RESEARCH PRO-**
2 **GRAM.**

3 (a) IN GENERAL.—The Secretary shall conduct a
4 program of research and development to evaluate the po-
5 tential for concentrating solar power for hydrogen produc-
6 tion, including cogeneration approaches for both hydrogen
7 and electricity.

8 (b) ADMINISTRATION.—The program shall take ad-
9 vantage of existing facilities to the extent practicable and
10 shall include—

11 (1) development of optimized technologies that
12 are common to both electricity and hydrogen produc-
13 tion;

14 (2) evaluation of thermochemical cycles for hy-
15 drogen production at the temperatures attainable
16 with concentrating solar power;

17 (3) evaluation of materials issues for the
18 thermochemical cycles described in paragraph (2);

19 (4) system architectures and economics studies;
20 and

21 (5) coordination with activities under the Ad-
22 vanced Reactor Hydrogen Co-generation Project es-
23 tablished under subtitle C of title VI on high tem-
24 perature materials, thermochemical cycles, and eco-
25 nomic issues.

1 (c) ASSESSMENT.—In carrying out the program
2 under this section, the Secretary shall—

3 (1) assess conflicting guidance on the economic
4 potential of concentrating solar power for electricity
5 production received from the National Research
6 Council in the report entitled “Renewable Power
7 Pathways: A Review of the U.S. Department of En-
8 ergy’s Renewable Energy Programs” and dated
9 2000 and subsequent reviews of that report funded
10 by the Department; and

11 (2) provide an assessment of the potential im-
12 pact of technology used to concentrate solar power
13 for electricity before, or concurrent with, submission
14 of the budget for fiscal year 2007.

15 (d) REPORT.—Not later than 5 years after the date
16 of enactment of this Act, the Secretary shall provide to
17 Congress a report on the economic and technical potential
18 for electricity or hydrogen production, with or without co-
19 generation, with concentrating solar power, including the
20 economic and technical feasibility of potential construction
21 of a pilot demonstration facility suitable for commercial
22 production of electricity or hydrogen from concentrating
23 solar power.

1 **SEC. 934. HYBRID SOLAR LIGHTING RESEARCH AND DEVEL-**
2 **OPMENT PROGRAM.**

3 (a) DEFINITION OF HYBRID SOLAR LIGHTING.—In
4 this section, the term “hybrid solar lighting” means a
5 novel lighting system that integrates sunlight and elec-
6 trical lighting in complement to each other in common
7 lighting fixtures for the purpose of improving energy effi-
8 ciency.

9 (b) PROGRAM.—The Secretary shall conduct a pro-
10 gram of research, development, demonstration, and com-
11 mercial application for hybrid solar lighting aimed at de-
12 veloping hybrid solar lighting systems that are—

13 (1) designed to eliminate large roof penetra-
14 tions and associated architectural design and main-
15 tenance problems that limit the conventional use of
16 daylight in most buildings;

17 (2) easily integrated with electric lights; and

18 (3) compatible with a majority of electric lamps
19 and light fixtures.

20 (c) LIMITATIONS.—Funding authorized under this
21 section shall not be used for lighting systems based on
22 conventional daylighting installations such as skylights,
23 light wells, light shelves, or roof monitors.

24 (d) NATIONAL ACADEMY OF SCIENCES.—Not later
25 than 2 years after the date of enactment of this Act, the
26 Secretary shall enter into an arrangement with the Na-

1 tional Academy of Sciences to conduct a biannual review
2 of the activities under this section including program pri-
3 orities, technical milestones, and opportunities for tech-
4 nology transfer and commercialization.

5 (e) AUTHORIZATION OF APPROPRIATIONS.—There
6 are authorized to be appropriated to carry out this
7 section—

8 (1) \$4,000,000 for fiscal year 2006;

9 (2) \$6,000,000 for fiscal year 2007; and

10 (3) \$6,000,000 for fiscal year 2008.

11 **SEC. 935. MISCELLANEOUS PROJECTS.**

12 The Secretary shall conduct research, development,
13 demonstration, and commercial application programs
14 for—

15 (1) ocean energy, including wave energy;

16 (2) the combined use of renewable energy tech-
17 nologies with 1 another and with other energy tech-
18 nologies, including the combined use of wind power
19 and coal gasification technologies; and

20 (3) renewable energy technologies for cogenera-
21 tion of hydrogen and electricity.

22 **Subtitle D—Nuclear Energy**

23 **SEC. 941. NUCLEAR ENERGY.**

24 (a) CORE PROGRAMS.—There are authorized to be
25 appropriated to the Secretary to carry out nuclear energy

1 research, development, demonstration, and commercial ap-
2 plication activities, including activities authorized under
3 this subtitle, other than those described in subsection
4 (b)—

5 (1) \$330,000,000 for fiscal year 2006;

6 (2) \$355,000,000 for fiscal year 2007; and

7 (3) \$495,000,000 for fiscal year 2008.

8 (b) NUCLEAR INFRASTRUCTURE SUPPORT.—There
9 are authorized to be appropriated to the Secretary to carry
10 out activities under section 942(f):

11 (1) \$135,000,000 for fiscal year 2006;

12 (2) \$140,000,000 for fiscal year 2007; and

13 (3) \$145,000,000 for fiscal year 2008.

14 (c) ALLOCATIONS.—From amounts authorized under
15 subsection (a), the following sums are authorized:

16 (1) For activities under section 943—

17 (A) \$150,000,000 for fiscal year 2006;

18 (B) \$155,000,000 for fiscal year 2007; and

19 (C) \$275,000,000 for fiscal year 2008.

20 (2) For activities under section 944—

21 (A) \$43,600,000 for fiscal year 2006;

22 (B) \$50,100,000 for fiscal year 2007; and

23 (C) \$56,000,000 for fiscal year 2008.

1 (3) For activities under section 946,
2 \$6,000,000 for each of fiscal years 2006 through
3 2008.

4 (d) LIMITATION.—None of the funds authorized
5 under this section may be used to decommission the Fast
6 Flux Test Facility.

7 **SEC. 942. NUCLEAR ENERGY RESEARCH PROGRAMS.**

8 (a) NUCLEAR ENERGY RESEARCH INITIATIVE.—The
9 Secretary shall carry out a Nuclear Energy Research Ini-
10 tiative for research and development related to nuclear en-
11 ergy.

12 (b) NUCLEAR ENERGY PLANT OPTIMIZATION PRO-
13 GRAM.—The Secretary shall carry out a Nuclear Energy
14 Plant Optimization Program to support research and de-
15 velopment activities addressing reliability, availability, pro-
16 ductivity, component aging, safety, and security of existing
17 nuclear power plants.

18 (c) NUCLEAR POWER 2010 PROGRAM.—

19 (1) IN GENERAL.—The Secretary shall carry
20 out a Nuclear Power 2010 Program, consistent with
21 recommendations of the Nuclear Energy Research
22 Advisory Committee of the Department in the report
23 entitled “A Roadmap to Deploy New Nuclear Power
24 Plants in the United States by 2010” and dated Oc-
25 tober 2001.

1 (2) ADMINISTRATION.—The Program shall
2 include—

3 (A) use of the expertise and capabilities of
4 industry, institutions of higher education, and
5 National Laboratories in evaluation of advanced
6 nuclear fuel cycles and fuels testing;

7 (B) consideration of a variety of reactor
8 designs suitable for both developed and devel-
9 oping nations;

10 (C) participation of international collabo-
11 rators in research, development, and design ef-
12 forts, as appropriate; and

13 (D) encouragement for participation by in-
14 stitutions of higher education and industry.

15 (d) GENERATION IV NUCLEAR ENERGY SYSTEMS
16 INITIATIVE.—

17 (1) IN GENERAL.—The Secretary shall carry
18 out a Generation IV Nuclear Energy Systems Initia-
19 tive to develop an overall technology plan for and to
20 support research and development necessary to make
21 an informed technical decision about the most prom-
22 ising candidates for eventual commercial application.

23 (2) ADMINISTRATION.—In conducting the Ini-
24 tiative, the Secretary shall examine advanced pro-

1 proliferation-resistant and passively safe reactor de-
2 signs, including designs that—

3 (A) are economically competitive with other
4 electric power generation plants;

5 (B) have higher efficiency, lower cost, and
6 improved safety compared to reactors in oper-
7 ation on the date of enactment of this Act;

8 (C) use fuels that are proliferation resist-
9 ant and have substantially reduced production
10 of high-level waste per unit of output; and

11 (D) use improved instrumentation.

12 (e) REACTOR PRODUCTION OF HYDROGEN.—The
13 Secretary shall carry out research to examine designs for
14 high-temperature reactors capable of producing large-scale
15 quantities of hydrogen using thermochemical processes.

16 (f) NUCLEAR INFRASTRUCTURE SUPPORT.—

17 (1) IN GENERAL.—The Secretary shall—

18 (A) develop and implement a strategy for
19 the facilities of the Office of Nuclear Energy,
20 Science, and Technology; and

21 (B) submit to Congress a report describing
22 the strategy, along with the budget request of
23 the President submitted to Congress for fiscal
24 year 2006.

1 (2) ADMINISTRATION.—The strategy shall pro-
2 vide a cost-effective means for—

3 (A) maintaining existing facilities and in-
4 frastructure;

5 (B) closing unneeded facilities;

6 (C) making facility upgrades and modifica-
7 tions; and

8 (D) building new facilities.

9 **SEC. 943. ADVANCED FUEL CYCLE INITIATIVE.**

10 (a) IN GENERAL.—The Secretary, acting through the
11 Director of the Office of Nuclear Energy, Science and
12 Technology, shall conduct an advanced fuel recycling tech-
13 nology research and development program (referred to in
14 this section as the “program”) to evaluate proliferation-
15 resistant fuel recycling and transmutation technologies
16 that minimize environmental or public health and safety
17 impacts as an alternative to aqueous reprocessing tech-
18 nologies deployed as of the date of enactment of this Act
19 in support of evaluation of alternative national strategies
20 for spent nuclear fuel and the Generation IV advanced re-
21 actor concepts.

22 (b) ANNUAL REVIEW.—The program shall be subject
23 to annual review by the Nuclear Energy Research Advi-
24 sory Committee of the Department or other independent
25 entity, as appropriate.

1 (c) INTERNATIONAL COOPERATION.—In carrying out
2 the program, the Secretary is encouraged to seek opportu-
3 nities to enhance the progress of the program through
4 international cooperation.

5 (d) REPORTS.—The Secretary shall submit, as part
6 of the annual budget submission of the Department, a re-
7 port on the activities of the program.

8 **SEC. 944. NUCLEAR SCIENCE AND ENGINEERING SUPPORT**
9 **FOR INSTITUTIONS OF HIGHER EDUCATION.**

10 (a) ESTABLISHMENT.—The Secretary shall support
11 a program to invest in human resources and infrastructure
12 in the nuclear sciences and engineering and related fields
13 (including health physics and nuclear and radiochemistry),
14 consistent with departmental missions related to civilian
15 nuclear research and development.

16 (b) DUTIES.—

17 (1) IN GENERAL.—In carrying out the program
18 under this section, the Secretary shall—

19 (A) establish fellowship and faculty assist-
20 ance programs; and

21 (B) provide support for fundamental re-
22 search and encourage collaborative research
23 among industry, National Laboratories, and in-
24 stitutions of higher education through the Nu-

1 clear Energy Research Initiative established
2 under section 942(a).

3 (2) ENTIRE FUEL CYCLE.—The Secretary is en-
4 couraged to support activities addressing the entire
5 fuel cycle through involvement of the Office of Nu-
6 clear Energy, Science and Technology and the Office
7 of Civilian Radioactive Waste Management.

8 (3) OUTREACH.—The Secretary shall support
9 communication and outreach related to nuclear
10 science, engineering, and nuclear waste manage-
11 ment.

12 (c) MAINTAINING RESEARCH AND TRAINING REAC-
13 TORS AND ASSOCIATED INFRASTRUCTURE IN INSTITU-
14 TIONS OF HIGHER EDUCATION.—Activities under this sec-
15 tion may include—

16 (1) converting research reactors currently using
17 high-enrichment fuels to low-enrichment fuels;

18 (2) upgrading operational instrumentation;

19 (3) sharing of reactors among institutions of
20 higher education;

21 (4) providing technical assistance, in collabora-
22 tion with the United States nuclear industry, in reli-
23 censing and upgrading training reactors as part of
24 a student training program; and

1 (5) providing funding for reactor improvements
2 as part of a focused effort that emphasizes research,
3 training, and education.

4 (d) INTERACTIONS BETWEEN NATIONAL LABORA-
5 TORIES AND INSTITUTIONS OF HIGHER EDUCATION.—
6 The Secretary shall develop sabbatical fellowship and vis-
7 iting scientist programs to encourage sharing of personnel
8 between National Laboratories and institutions of higher
9 education.

10 (e) OPERATING AND MAINTENANCE COSTS.—Fund-
11 ing for a research project provided under this section may
12 be used to offset a portion of the operating and mainte-
13 nance costs of a research reactor at an institution of high-
14 er education used in the research project.

15 **SEC. 945. SECURITY OF NUCLEAR FACILITIES.**

16 The Secretary, acting through the Director of the Of-
17 fice of Nuclear Energy, Science and Technology, shall con-
18 duct a research and development program on cost-effective
19 technologies for increasing—

20 (1) the safety of nuclear facilities from natural
21 phenomena; and

22 (2) the security of nuclear facilities from delib-
23 erate attacks.

1 **SEC. 946. ALTERNATIVES TO INDUSTRIAL RADIOACTIVE**
2 **SOURCES.**

3 (a) SURVEY.—

4 (1) IN GENERAL.—Not later than August 1,
5 2006, the Secretary shall submit to Congress the re-
6 sults of a survey of industrial applications of large
7 radioactive sources.

8 (2) ADMINISTRATION.—The survey shall—

9 (A) consider well-logging sources as 1 class
10 of industrial sources;

11 (B) include information on current domes-
12 tic and international Department, Department
13 of Defense, State Department, and commercial
14 programs to manage and dispose of radioactive
15 sources; and

16 (C) analyze available disposal options for
17 currently deployed or future sources and, if de-
18 ficiencies are noted for either deployed or future
19 sources, recommend legislative options that
20 Congress may consider to remedy identified de-
21 ficiencies.

22 (b) PLAN.—

23 (1) IN GENERAL.—In conjunction with the sur-
24 vey conducted under subsection (a), the Secretary
25 shall establish a research and development program
26 to develop alternatives to sources described in sub-

1 section (a) that reduce safety, environmental, or pro-
2 liferation risks to either workers using the sources or
3 the public.

4 (2) ACCELERATORS.—Miniaturized particle ac-
5 celerators for well-logging or other industrial appli-
6 cations and portable accelerators for production of
7 short-lived radioactive materials at an industrial site
8 shall be considered as part of the research and de-
9 velopment efforts.

10 (3) REPORT.—Not later than August 1, 2006,
11 the Secretary shall submit to Congress a report de-
12 scribing the details of the program plan.

13 **Subtitle E—Fossil Energy**

14 **SEC. 951. FOSSIL ENERGY.**

15 (a) IN GENERAL.—There are authorized to be appro-
16 priated to the Secretary to carry out fossil energy re-
17 search, development, demonstration, and commercial ap-
18 plication activities, including activities authorized under
19 this subtitle—

20 (1) \$558,000,000 for fiscal year 2006;

21 (2) \$585,000,000 for fiscal year 2007; and

22 (3) \$600,000,000 for fiscal year 2008.

23 (b) ALLOCATIONS.—From amounts authorized under
24 subsection (a), the following sums are authorized:

1 (1) For activities under section 952(b)(2),
2 \$28,000,000 for each of fiscal years 2004 through
3 2008.

4 (2) For activities under section 954,
5 \$20,000,000 for each of fiscal years 2006 through
6 2008.

7 (3) For activities under section 955,
8 \$220,500,000 for fiscal year 2006.

9 (4) For the Office of Arctic Energy under sec-
10 tion 3197 of the Floyd D. Spence National Defense
11 Authorization Act for Fiscal Year 2001 (42 U.S.C.
12 7144d) \$25,000,000 for each of fiscal years 2004
13 through 2008.

14 (c) EXTENDED AUTHORIZATION.—There are author-
15 ized to be appropriated to the Secretary for the Office of
16 Arctic Energy established under section 3197 of the Floyd
17 D. Spence National Defense Authorization Act for Fiscal
18 Year 2001 (42 U.S.C. 7144d) \$25,000,000 for each of
19 fiscal years 2009 through 2012.

20 (d) LIMITATIONS.—

21 (1) USES.—None of the funds authorized under
22 this section may be used for Fossil Energy Environ-
23 mental Restoration or Import/Export Authorization.

24 (2) INSTITUTIONS OF HIGHER EDUCATION.—Of
25 the funds authorized under subsection (b)(2), not

1 less than 20 percent of the funds appropriated for
2 each fiscal year shall be dedicated to research and
3 development carried out at institutions of higher
4 education.

5 **SEC. 952. OIL AND GAS RESEARCH PROGRAMS.**

6 (a) OIL AND GAS RESEARCH.—The Secretary shall
7 conduct a program of research, development, demonstra-
8 tion, and commercial application of oil and gas,
9 including—

- 10 (1) exploration and production;
- 11 (2) gas hydrates;
- 12 (3) reservoir life and extension;
- 13 (4) transportation and distribution infrastruc-
14 ture;
- 15 (5) ultraclean fuels;
- 16 (6) heavy oil and shale; and
- 17 (7) related environmental research.

18 (b) FUEL CELLS.—

19 (1) IN GENERAL.—The Secretary shall conduct
20 a program of research, development, demonstration,
21 and commercial application on fuel cells for low-cost,
22 high-efficiency, fuel-flexible, modular power systems.

23 (2) DEMONSTRATIONS.—The demonstrations
24 shall include fuel cell proton exchange membrane
25 technology for commercial, residential, and transpor-

1 tation applications, and distributed generation sys-
2 tems, using improved manufacturing production and
3 processes.

4 (c) NATURAL GAS AND OIL DEPOSITS REPORT.—
5 Not later than 2 years after the date of enactment of this
6 Act and every 2 years thereafter, the Secretary of the Inte-
7 rior, in consultation with other appropriate Federal agen-
8 cies, shall submit to Congress a report on the latest esti-
9 mates of natural gas and oil reserves, reserves growth, and
10 undiscovered resources in Federal and State waters off the
11 coast of Louisiana and Texas.

12 (d) INTEGRATED CLEAN POWER AND ENERGY RE-
13 SEARCH.—

14 (1) ESTABLISHMENT OF CENTER.—The Sec-
15 retary shall establish a national center or consortium
16 of excellence in clean energy and power generation,
17 using the resources of the Clean Power and Energy
18 Research Consortium in existence on the date of en-
19 actment of this Act, to address the critical depend-
20 ence of the United States on energy and the need
21 to reduce emissions.

22 (2) FOCUS AREAS.—The center or consortium
23 shall conduct a program of research, development,
24 demonstration, and commercial application on inte-
25 grating the following 6 focus areas:

1 (A) Efficiency and reliability of gas tur-
2 bines for power generation.

3 (B) Reduction in emissions from power
4 generation.

5 (C) Promotion of energy conservation
6 issues.

7 (D) Effectively using alternative fuels and
8 renewable energy.

9 (E) Development of advanced materials
10 technology for oil and gas exploration and use
11 in harsh environments.

12 (F) Education on energy and power gen-
13 eration issues.

14 **SEC. 953. METHANE HYDRATE RESEARCH.**

15 (a) IN GENERAL.—The Methane Hydrate Research
16 and Development Act of 2000 (30 U.S.C. 1902 note; Pub-
17 lic Law 106–193) is amended to read as follows:

18 **“SECTION 1. SHORT TITLE.**

19 “This Act may be cited as the ‘Methane Hydrate Re-
20 search and Development Act of 2000’.

21 **“SEC. 2. FINDINGS.**

22 “Congress finds that—

23 “(1) in order to promote energy independence
24 and meet the increasing demand for energy, the
25 United States will require a diversified portfolio of

1 substantially increased quantities of electricity, nat-
2 ural gas, and transportation fuels;

3 “(2) according to the report submitted to Con-
4 gress by the National Research Council entitled
5 ‘Charting the Future of Methane Hydrate Research
6 in the United States’, the total United States re-
7 sources of gas hydrates have been estimated to be on
8 the order of 200,000 trillion cubic feet;

9 “(3) according to the report of the National
10 Commission on Energy Policy entitled ‘Ending the
11 Energy Stalemate—A Bipartisan Strategy to Meet
12 America’s Energy Challenge’, and dated December
13 2004, the United States may be endowed with over
14 1/4 of the methane hydrate deposits in the world;

15 “(4) according to the Energy Information Ad-
16 ministration, a shortfall in natural gas supply from
17 conventional and unconventional sources is expected
18 to occur in or about 2020; and

19 “(5) the National Academy of Science states
20 that methane hydrate may have the potential to al-
21 leviate the projected shortfall in the natural gas sup-
22 ply.

23 **“SEC. 3. DEFINITIONS.**

24 “In this Act:

1 “(1) CONTRACT.—The term ‘contract’ means a
2 procurement contract within the meaning of section
3 6303 of title 31, United States Code.

4 “(2) COOPERATIVE AGREEMENT.—The term
5 ‘cooperative agreement’ means a cooperative agree-
6 ment within the meaning of section 6305 of title 31,
7 United States Code.

8 “(3) DIRECTOR.—The term ‘Director’ means
9 the Director of the National Science Foundation.

10 “(4) GRANT.—The term ‘grant’ means a grant
11 awarded under a grant agreement (within the mean-
12 ing of section 6304 of title 31, United States Code).

13 “(5) INDUSTRIAL ENTERPRISE.—The term ‘in-
14 dustrial enterprise’ means a private, nongovern-
15 mental enterprise that has an expertise or capability
16 that relates to methane hydrate research and devel-
17 opment.

18 “(6) INSTITUTION OF HIGHER EDUCATION.—
19 The term ‘institution of higher education’ means an
20 institution of higher education (as defined in section
21 102 of the Higher Education Act of 1965 (20
22 U.S.C. 1002)).

23 “(7) SECRETARY.—The term ‘Secretary’ means
24 the Secretary of Energy, acting through the Assist-
25 ant Secretary for Fossil Energy.

1 “(8) SECRETARY OF COMMERCE.—The term
2 ‘Secretary of Commerce’ means the Secretary of
3 Commerce, acting through the Administrator of the
4 National Oceanic and Atmospheric Administration.

5 “(9) SECRETARY OF DEFENSE.—The term
6 ‘Secretary of Defense’ means the Secretary of De-
7 fense, acting through the Secretary of the Navy.

8 “(10) SECRETARY OF THE INTERIOR.—The
9 term ‘Secretary of the Interior’ means the Secretary
10 of the Interior, acting through the Director of the
11 United States Geological Survey, the Director of the
12 Bureau of Land Management, and the Director of
13 the Minerals Management Service.

14 **“SEC. 4. METHANE HYDRATE RESEARCH AND DEVELOP-**
15 **MENT PROGRAM.**

16 “(a) IN GENERAL.—

17 “(1) COMMENCEMENT OF PROGRAM.—Not later
18 than 90 days after the date of enactment of the En-
19 ergy Research, Development, Demonstration, and
20 Commercial Application Act of 2005, the Secretary,
21 in consultation with the Secretary of Commerce, the
22 Secretary of Defense, the Secretary of the Interior,
23 and the Director, shall commence a program of
24 methane hydrate research and development in ac-
25 cordance with this section.

1 “(2) DESIGNATIONS.—The Secretary, the Sec-
2 retary of Commerce, the Secretary of Defense, the
3 Secretary of the Interior, and the Director shall des-
4 ignate individuals to carry out this section.

5 “(3) COORDINATION.—The individual des-
6 ignated by the Secretary shall coordinate all activi-
7 ties within the Department of Energy relating to
8 methane hydrate research and development.

9 “(4) MEETINGS.—The individuals designated
10 under paragraph (2) shall meet not later than 180
11 days after the date of enactment of the Energy Re-
12 search, Development, Demonstration, and Commer-
13 cial Application Act of 2005 and not less frequently
14 than every 180 days thereafter to—

15 “(A) review the progress of the program
16 under paragraph (1); and

17 “(B) coordinate interagency research and
18 partnership efforts in carrying out the program.

19 “(b) GRANTS, CONTRACTS, COOPERATIVE AGREE-
20 MENTS, INTERAGENCY FUNDS TRANSFER AGREEMENTS,
21 AND FIELD WORK PROPOSALS.—

22 “(1) ASSISTANCE AND COORDINATION.—In car-
23 rying out the program of methane hydrate research
24 and development authorized by this section, the Sec-
25 retary may award grants to, or enter into contracts

1 or cooperative agreements with, institutions of high-
2 er education, oceanographic institutions, and indus-
3 trial enterprises to—

4 “(A) conduct basic and applied research to
5 identify, explore, assess, and develop methane
6 hydrate as a commercially viable source of en-
7 ergy;

8 “(B) identify methane hydrate resources
9 through remote sensing;

10 “(C) acquire and reprocess seismic data
11 suitable for characterizing methane hydrate ac-
12 cumulations;

13 “(D) assist in developing technologies re-
14 quired for efficient and environmentally sound
15 development of methane hydrate resources;

16 “(E) promote education and training in
17 methane hydrate resource research and re-
18 source development through fellowships or other
19 means for graduate education and training;

20 “(F) conduct basic and applied research to
21 assess and mitigate the environmental impact of
22 hydrate degassing (including both natural
23 degassing and degassing associated with com-
24 mercial development);

1 “(G) develop technologies to reduce the
2 risks of drilling through methane hydrates; and

3 “(H) conduct exploratory drilling, well
4 testing, and production testing operations on
5 permafrost and non-permafrost gas hydrates in
6 support of the activities authorized by this
7 paragraph, including drilling of 1 or more full-
8 scale production test wells.

9 “(2) COMPETITIVE PEER REVIEW.—Funds
10 made available under paragraph (1) shall be made
11 available based on a competitive process using exter-
12 nal scientific peer review of proposed research.

13 “(c) METHANE HYDRATES ADVISORY PANEL.—

14 “(1) IN GENERAL.—The Secretary shall estab-
15 lish an advisory panel (including the hiring of appro-
16 priate staff) consisting of representatives of indus-
17 trial enterprises, institutions of higher education,
18 oceanographic institutions, State agencies, and envi-
19 ronmental organizations with knowledge and exper-
20 tise in the natural gas hydrates field, to—

21 “(A) assist in developing recommendations
22 and broad programmatic priorities for the
23 methane hydrate research and development pro-
24 gram carried out under subsection (a)(1);

1 “(B) provide scientific oversight for the
2 methane hydrates program, including assessing
3 progress toward program goals, evaluating pro-
4 gram balance, and providing recommendations
5 to enhance the quality of the program over
6 time; and

7 “(C) not later than 2 years after the date
8 of enactment of the Energy Research, Develop-
9 ment, Demonstration, and Commercial Applica-
10 tion Act of 2005, and at such later dates as the
11 panel considers advisable, submit to Congress—

12 “(i) an assessment of the methane hy-
13 drate research program; and

14 “(ii) an assessment of the 5-year re-
15 search plan of the Department of Energy.

16 “(2) CONFLICTS OF INTEREST.—In appointing
17 each member of the advisory panel established under
18 paragraph (1), the Secretary shall ensure, to the
19 maximum extent practicable, that the appointment
20 of the member does not pose a conflict of interest
21 with respect to the duties of the member under this
22 Act.

23 “(3) MEETINGS.—The advisory panel shall—

1 “(A) hold the initial meeting of the advisory
2 sory panel not later than 180 days after the
3 date of establishment of the advisory panel; and

4 “(B) meet biennially thereafter.

5 “(4) COORDINATION.—The advisory panel shall
6 coordinate activities of the advisory panel with program
7 managers of the Department of Energy at appropriate
8 national laboratories

9 “(d) CONSTRUCTION COSTS.—None of the funds
10 made available to carry out this section may be used for
11 the construction of a new building or the acquisition, expansion,
12 remodeling, or alteration of an existing building
13 (including site grading and improvement and architect
14 fees).

15 “(e) RESPONSIBILITIES OF THE SECRETARY.—In
16 carrying out subsection (b)(1), the Secretary shall—

17 “(1) facilitate and develop partnerships among
18 government, industrial enterprises, and institutions
19 of higher education to research, identify, assess, and
20 explore methane hydrate resources;

21 “(2) undertake programs to develop basic information
22 necessary for promoting long-term interest in
23 methane hydrate resources as an energy source;

1 “(3) ensure that the data and information de-
2 veloped through the program are accessible and
3 widely disseminated as needed and appropriate;

4 “(4) promote cooperation among agencies that
5 are developing technologies that may hold promise
6 for methane hydrate resource development;

7 “(5) report annually to Congress on the results
8 of actions taken to carry out this Act; and

9 “(6) ensure, to the maximum extent prac-
10 ticable, greater participation by the Department of
11 Energy in international cooperative efforts.

12 **“SEC. 5. NATIONAL RESEARCH COUNCIL STUDY.**

13 “(a) AGREEMENT FOR STUDY.—The Secretary shall
14 offer to enter into an agreement with the National Re-
15 search Council under which the National Research Council
16 shall—

17 “(1) conduct a study of the progress made
18 under the methane hydrate research and develop-
19 ment program implemented under this Act; and

20 “(2) make recommendations for future methane
21 hydrate research and development needs.

22 “(b) REPORT.—Not later than September 30, 2009,
23 the Secretary shall submit to Congress a report containing
24 the findings and recommendations of the National Re-
25 search Council under this section.

1 **“SEC. 6. REPORTS AND STUDIES FOR CONGRESS.**

2 “The Secretary shall provide to the Committee on
3 Science of the House of Representatives and the Com-
4 mittee on Energy and Natural Resources of the Senate
5 copies of any report or study that the Department of En-
6 ergy prepares at the direction of any committee of Con-
7 gress relating to the methane hydrate research and devel-
8 opment program implemented under this Act.

9 **“SEC. 7. AUTHORIZATION OF APPROPRIATIONS.**

10 “There are authorized to be appropriated to the Sec-
11 retary to carry out this Act, to remain available until
12 expended—

13 “(1) \$15,000,000 for fiscal year 2006;

14 “(2) \$20,000,000 for fiscal year 2007;

15 “(3) \$30,000,000 for fiscal year 2008;

16 “(4) \$50,000,000 for fiscal year 2009; and

17 “(5) \$50,000,000 for fiscal year 2010.”.

18 (b) RECLASSIFICATION.—The Law Revision Counsel
19 shall reclassify the Methane Hydrate Research and Devel-
20 opment Act of 2000 (30 U.S.C. 1902 note; Public Law
21 106–193) to a new chapter at the end of title 30, United
22 States Code.

1 **SEC. 954. RESEARCH AND DEVELOPMENT FOR COAL MIN-**
2 **ING TECHNOLOGIES.**

3 (a) ESTABLISHMENT.—The Secretary shall carry out
4 a program for research and development on coal mining
5 technologies.

6 (b) COOPERATION.—In carrying out the program, the
7 Secretary shall cooperate with appropriate Federal agen-
8 cies, coal producers, trade associations, equipment manu-
9 facturers, institutions of higher education with mining en-
10 gineering departments, and other relevant entities.

11 (c) PROGRAM.—The research and development activi-
12 ties carried out under this section shall—

13 (1) be guided by the mining research and devel-
14 opment priorities identified by the Mining Industry
15 of the Future Program and in the recommendations
16 from relevant reports of the National Academy of
17 Sciences on mining technologies;

18 (2) include activities exploring minimization of
19 contaminants in mined coal that contribute to envi-
20 ronmental concerns including development and dem-
21 onstration of electromagnetic wave imaging ahead of
22 mining operations;

23 (3) develop and demonstrate coal bed electro-
24 magnetic wave imaging and techniques for hori-
25 zontal drilling in order to—

26 (A) increase methane recovery efficiency;

1 (B) prevent spoilage of domestic coal re-
2 serves; and

3 (C) minimize water disposal associated
4 with methane extraction; and

5 (4) expand mining research capabilities at insti-
6 tutions of higher education.

7 **SEC. 955. COAL AND RELATED TECHNOLOGIES PROGRAM.**

8 (a) IN GENERAL.—In addition to the programs au-
9 thorized under title II, the Secretary shall conduct a pro-
10 gram of technology research, development, and demonstra-
11 tion and commercial application for coal and power sys-
12 tems, including programs to facilitate production and gen-
13 eration of coal-based power through—

14 (1) innovations for existing plants;

15 (2) integrated gasification combined cycle;

16 (3) advanced combustion systems;

17 (4) turbines for synthesis gas derived from coal;

18 (5) carbon capture and sequestration research
19 and development;

20 (6) coal-derived transportation fuels and chemi-
21 cals;

22 (7) liquid fuels derived from low rank coal
23 water;

24 (8) removal of elemental mercury;

25 (9) solid fuels and feedstocks; and

1 (10) advanced coal-related research.

2 (b) COST AND PERFORMANCE GOALS.—

3 (1) IN GENERAL.—In carrying out programs
4 authorized by this section, the Secretary shall iden-
5 tify cost and performance goals for coal-based tech-
6 nologies that would permit the continued cost-com-
7 petitive use of coal for electricity generation, as
8 chemical feedstocks, and as transportation fuel in
9 2007, 2010, 2012, and 2015.

10 (2) ADMINISTRATION.—In establishing the cost
11 and performance goals, the Secretary shall—

12 (A) consider activities and studies under-
13 taken as of the date of enactment of this Act
14 by industry in cooperation with the Department
15 in support of the identification of the goals;

16 (B) consult with interested entities,
17 including—

18 (i) coal producers;

19 (ii) industries using coal;

20 (iii) organizations that promote coal
21 and advanced coal technologies;

22 (iv) environmental organizations; and

23 (v) organizations representing work-
24 ers;

1 (C) not later than 120 days after the date
2 of enactment of this Act, publish in the Federal
3 Register proposed draft cost and performance
4 goals for public comments; and

5 (D) not later than 180 days after the date
6 of enactment of this Act and every 4 years
7 thereafter, submit to Congress a report describ-
8 ing the final cost and performance goals for the
9 technologies that includes—

10 (i) a list of technical milestones; and

11 (ii) an explanation of how programs
12 authorized in this section will not duplicate
13 the activities authorized under the Clean
14 Coal Power Initiative authorized under
15 title II.

16 **SEC. 956. CARBON DIOXIDE CAPTURE RESEARCH AND DE-**
17 **VELOPMENT.**

18 (a) PROGRAM.—The Secretary shall establish a pro-
19 gram of research and development aimed at developing
20 carbon dioxide capture technologies for pulverized coal
21 combustion units.

22 (b) FOCUS.—The program under subsection (a) shall
23 focus on—

24 (1) developing add-on carbon dioxide capture
25 technologies, such as adsorption and absorption

1 techniques and chemical processes, to remove carbon
2 dioxide from the flue gas, producing concentrated
3 streams of carbon dioxide potentially amendable to
4 sequestration;

5 (2) combustion technologies that would directly
6 produce concentrated streams of carbon dioxide po-
7 tentially amenable to sequestration; and

8 (3) minimizing the efficiency losses associated
9 with carbon capture and sequestration.

10 (b) CARBON SEQUESTRATION.—In conjunction with
11 the program under subsection (a), the Secretary shall con-
12 tinue pursuit of a carbon sequestration program involving
13 public-private partnerships.

14 **SEC. 957. COMPLEX WELL TECHNOLOGY TESTING FACIL-**
15 **ITY.**

16 The Secretary, in coordination with industry leaders
17 in extended research drilling technology, shall establish a
18 Complex Well Technology Testing Facility at the Rocky
19 Mountain Oilfield Testing Center to increase the range of
20 extended drilling technologies.

21 **Subtitle F—Science**

22 **SEC. 961. SCIENCE.**

23 (a) IN GENERAL.—There are authorized to be appro-
24 priated to the Secretary to carry out research, develop-
25 ment, demonstration, and commercial application activi-

1 ties of the Office of Science, including activities authorized
2 under this subtitle (including the amounts authorized
3 under the amendment made by section 967(b) and includ-
4 ing basic energy sciences, advanced scientific and com-
5 puting research, biological and environmental research, fu-
6 sion energy sciences, high energy physics, nuclear physics,
7 research analysis, and infrastructure support)—

8 (1) \$4,153,000,000 for fiscal year 2006;

9 (2) \$4,586,000,000 for fiscal year 2007; and

10 (3) \$5,000,000,000 for fiscal year 2008.

11 (b) ALLOCATIONS.—From amounts authorized under
12 subsection (a), the following sums are authorized:

13 (1) For activities under the Fusion Energy
14 Sciences program (including activities under section
15 962)—

16 (A) \$349,000,000 for fiscal year 2006;

17 (B) \$362,000,000 for fiscal year 2007; and

18 (C) \$377,000,000 for fiscal year 2008.

19 (2) For activities under the catalysis research
20 program established under section 964—

21 (A) \$35,000,000 for fiscal year 2006;

22 (B) \$36,500,000 for fiscal year 2007; and

23 (C) \$38,200,000 for fiscal year 2008.

24 (3) For activities under the Genomes to Life
25 Program established under section 968—

1 (A) \$170,000,000 for fiscal year 2006;

2 (B) \$325,000,000 for fiscal year 2007; and

3 (C) \$415,000,000 for fiscal year 2008.

4 (4) For construction and ancillary equipment
5 for user facilities under section 968(d) for the
6 Genomes to Life Program, of the amounts author-
7 ized under paragraph (3)—

8 (A) \$70,000,000 for fiscal year 2006;

9 (B) \$175,000,000 for fiscal year 2007; and

10 (C) \$215,000,000 for fiscal year 2008.

11 (5) For activities under the Energy-Water Sup-
12 ply Technologies Program established under section
13 970, \$30,000,000 for each of fiscal years 2006
14 through 2008.

15 (c) FUSION ENERGY SCIENCES PROGRAM.—In addi-
16 tion to the funds authorized under subsection (b)(1), there
17 are authorized to be appropriated for construction costs
18 associated with the Fusion Energy Sciences Program
19 under section 962—

20 (1) \$55,000,000 for fiscal year 2006;

21 (2) \$95,000,000 for fiscal year 2007; and

22 (3) \$115,000,000 for fiscal year 2008.

23 **SEC. 962. FUSION ENERGY SCIENCES PROGRAM.**

24 (a) DECLARATION OF POLICY.—It shall be the policy
25 of the United States to conduct research, development,

1 demonstration, and commercial applications to provide for
2 the scientific, engineering, and commercial infrastructure
3 necessary to ensure that the United States is competitive
4 with other countries in providing fusion energy for its own
5 needs and the needs of other countries, including by dem-
6 onstrating electric power or hydrogen production for the
7 United States energy grid using fusion energy at the ear-
8 liest date.

9 (b) PLANNING.—

10 (1) IN GENERAL.—Not later than 180 days
11 after the date of enactment of this Act, the Sec-
12 retary shall submit to Congress a plan (with pro-
13 posed cost estimates, budgets, and lists of potential
14 international partners) for the implementation of the
15 policy described in subsection (a) in a manner that
16 ensures that—

17 (A) existing fusion research facilities are
18 more fully used;

19 (B) fusion science, technology, theory, ad-
20 vanced computation, modeling, and simulation
21 are strengthened;

22 (C) new magnetic and inertial fusion re-
23 search and development facilities are selected
24 based on scientific innovation and cost effective-
25 ness, and the potential of the facilities to ad-

1 vance the goal of practical fusion energy at the
2 earliest date practicable;

3 (D) facilities that are selected are funded
4 at a cost-effective rate;

5 (E) communication of scientific results and
6 methods between the fusion energy science com-
7 munity and the broader scientific and tech-
8 nology communities is improved;

9 (F) inertial confinement fusion facilities
10 are used to the extent practicable for the pur-
11 pose of inertial fusion energy research and de-
12 velopment;

13 (G) attractive alternative inertial and mag-
14 netic fusion energy approaches are more fully
15 explored; and

16 (H) to the extent practicable, the rec-
17 ommendations of the Fusion Energy Sciences
18 Advisory Committee in the report on workforce
19 planning, dated March 2004, are carried out,
20 including periodic reassessment of program
21 needs.

22 (2) COSTS AND SCHEDULES.—The plan shall
23 also address the status of and, to the extent prac-
24 ticable, costs and schedules for—

1 (A) the design and implementation of
2 international or national facilities for the test-
3 ing of fusion materials; and

4 (B) the design and implementation of
5 international or national facilities for the test-
6 ing and development of key fusion technologies.

7 (c) UNITED STATES PARTICIPATION IN ITER.—

8 (1) DEFINITIONS.—In this subsection:

9 (A) CONSTRUCTION.—

10 (i) IN GENERAL.—The term “con-
11 struction” means—

12 (I) the physical construction of
13 the ITER facility; and

14 (II) the physical construction,
15 purchase, or manufacture of equip-
16 ment or components that are specifi-
17 cally designed for the ITER facility.

18 (ii) EXCLUSIONS.—The term “con-
19 struction” does not include the design of
20 the facility, equipment, or components.

21 (B) ITER.—The term “ITER” means the
22 international burning plasma fusion research
23 project in which the President announced
24 United States participation on January 30,
25 2003, or any similar international project.

1 (2) PARTICIPATION.—The United States may
2 participate in the ITER only in accordance with this
3 subsection.

4 (3) AGREEMENT.—

5 (A) IN GENERAL.—The Secretary may ne-
6 gotiate an agreement for United States partici-
7 pation in the ITER.

8 (B) CONTENTS.—Any agreement for
9 United States participation in the ITER shall,
10 at a minimum—

11 (i) clearly define the United States fi-
12 nancial contribution to construction and
13 operating costs, as well as any other costs
14 associated with a project;

15 (ii) ensure that the share of high-tech-
16 nology components of the ITER manufac-
17 tured in the United States is at least pro-
18 portionate to the United States financial
19 contribution to the ITER;

20 (iii) ensure that the United States will
21 not be financially responsible for cost over-
22 runs in components manufactured in other
23 ITER participating countries;

24 (iv) guarantee the United States full
25 access to all data generated by the ITER;

1 (v) enable United States researchers
2 to propose and carry out an equitable
3 share of the experiments at the ITER;

4 (vi) provide the United States with a
5 role in all collective decisionmaking related
6 to the ITER; and

7 (vii) describe the process for dis-
8 continuing or decommissioning the ITER
9 and any United States role in that process.

10 (4) PLAN.—

11 (A) DEVELOPMENT.—The Secretary, in
12 consultation with the Fusion Energy Sciences
13 Advisory Committee, shall develop a plan for
14 the participation of United States scientists in
15 the ITER that shall include—

16 (i) the United States research agenda
17 for the ITER;

18 (ii) methods to evaluate whether the
19 ITER is promoting progress toward mak-
20 ing fusion a reliable and affordable source
21 of power; and

22 (iii) a description of how work at the
23 ITER will relate to other elements of the
24 United States fusion program.

1 (B) REVIEW.—The Secretary shall request
2 a review of the plan by the National Academy
3 of Sciences.

4 (5) LIMITATION.—No Federal funds shall be
5 expended for the construction of the ITER until the
6 Secretary has submitted to Congress—

7 (A) the agreement negotiated in accord-
8 ance with paragraph (3) and 120 days have
9 elapsed since that submission;

10 (B) a report describing the management
11 structure of the ITER and providing a fixed
12 dollar estimate of the cost of United States par-
13 ticipation in the construction of the ITER, and
14 120 days have elapsed since that submission;

15 (C) a report describing how United States
16 participation in the ITER will be funded with-
17 out reducing funding for other programs in the
18 Office of Science (including other fusion pro-
19 grams), and 60 days have elapsed since that
20 submission; and

21 (D) the plan required by paragraph (4)
22 (but not the National Academy of Sciences re-
23 view of that plan), and 60 days have elapsed
24 since that submission.

25 (6) ALTERNATIVE TO ITER.—

1 (A) IN GENERAL.—If at any time during
2 the negotiations on the ITER, the Secretary de-
3 termines that construction and operation of the
4 ITER is unlikely or infeasible, the Secretary
5 shall submit to Congress, along with the budget
6 request of the President submitted to Congress
7 for the following fiscal year, a plan for imple-
8 menting a domestic burning plasma experiment
9 such as the Fusion Ignition Research Experi-
10 ment, including costs and schedules for the
11 plan.

12 (B) ADMINISTRATION.—The Secretary
13 shall—

14 (i) refine the plan in full consultation
15 with the Fusion Energy Sciences Advisory
16 Committee; and

17 (ii) transmit the plan to the National
18 Academy of Sciences for review.

19 **SEC. 963. SUPPORT FOR SCIENCE AND ENERGY FACILITIES**
20 **AND INFRASTRUCTURE.**

21 (a) FACILITY AND INFRASTRUCTURE POLICY.—

22 (1) IN GENERAL.—The Secretary shall develop
23 and implement a strategy for facilities and infra-
24 structure supported primarily from the Office of
25 Science, the Office of Energy Efficiency and Renew-

1 able Energy, the Office of Fossil Energy, or the Of-
2 fice of Nuclear Energy, Science and Technology Pro-
3 grams at all National Laboratories and single-pur-
4 pose research facilities.

5 (2) STRATEGY.—The strategy shall provide
6 cost-effective means for—

7 (A) maintaining existing facilities and in-
8 frastructure;

9 (B) closing unneeded facilities;

10 (C) making facility modifications; and

11 (D) building new facilities.

12 (b) REPORT.—

13 (1) IN GENERAL.—The Secretary shall prepare
14 and submit, along with the budget request of the
15 President submitted to Congress for fiscal year
16 2007, a report describing the strategy developed
17 under subsection (a).

18 (2) CONTENTS.—For each National Laboratory
19 and single-purpose research facility that is primarily
20 used for science and energy research, the report
21 shall contain—

22 (A) the current priority list of proposed fa-
23 cilities and infrastructure projects, including
24 cost and schedule requirements;

1 (B) a current 10-year plan that dem-
2 onstrates the reconfiguration of its facilities and
3 infrastructure to meet its missions and to ad-
4 dress its long-term operational costs and return
5 on investment;

6 (C) the total current budget for all facili-
7 ties and infrastructure funding; and

8 (D) the current status of each facility and
9 infrastructure project compared to the original
10 baseline cost, schedule, and scope.

11 **SEC. 964. CATALYSIS RESEARCH PROGRAM.**

12 (a) ESTABLISHMENT.—The Secretary, acting
13 through the Office of Science, shall support a program of
14 research and development in catalysis science consistent
15 with the statutory authorities of the Department related
16 to research and development.

17 (b) COMPONENTS.—The program shall include ef-
18 forts to—

19 (1) enable catalyst design using combinations of
20 experimental and mechanistic methodologies coupled
21 with computational modeling of catalytic reactions at
22 the molecular level;

23 (2) develop techniques for high throughput syn-
24 thesis, assay, and characterization at nanometer and

1 subnanometer scales in situ under actual operating
2 conditions;

3 (3) synthesize catalysts with specific site archi-
4 tectures;

5 (4) conduct research on the use of precious
6 metals for catalysis; and

7 (5) translate molecular understanding to the
8 design of catalytic compounds.

9 (c) DUTIES OF THE OFFICE OF SCIENCE.—In car-
10 rying out the program, the Director of the Office of
11 Science shall—

12 (1) support both individual investigators and
13 multidisciplinary teams of investigators to pioneer
14 new approaches in catalytic design;

15 (2) develop, plan, construct, acquire, share, or
16 operate special equipment or facilities for the use of
17 investigators in collaboration with national user fa-
18 cilities, such as nanoscience and engineering centers;

19 (3) support technology transfer activities to
20 benefit industry and other users of catalysis science
21 and engineering; and

22 (4) coordinate research and development activi-
23 ties with industry and other Federal agencies.

24 (d) TRIENNIAL ASSESSMENT.—Not later than 3
25 years after the date of enactment of this Act and every

1 3 years thereafter, the National Academy of Sciences
2 shall—

3 (1) review the catalysis program to measure—

4 (A) gains made in the fundamental science
5 of catalysis; and

6 (B) progress towards developing new fuels
7 for energy production and material fabrication
8 processes; and

9 (2) submit to Congress a report describing the
10 results of the review.

11 **SEC. 965. HYDROGEN.**

12 (a) IN GENERAL.—The Secretary shall conduct a
13 program of fundamental research and development in sup-
14 port of programs authorized under title VIII.

15 (b) METHODS.—The program shall include support
16 for methods of generating hydrogen without the use of
17 natural gas.

18 **SEC. 966. SOLID STATE LIGHTING.**

19 The Secretary shall conduct a program of funda-
20 mental research on advance solid state lighting in support
21 of the Next Generation Lighting Initiative carried out
22 under section 912.

23 **SEC. 967. ADVANCED SCIENTIFIC COMPUTING FOR ENERGY**
24 **MISSIONS.**

25 (a) PROGRAM.—

1 (1) IN GENERAL.—The Secretary shall conduct
2 an advanced scientific computing research and devel-
3 opment program that includes activities related to
4 applied mathematics and activities authorized by the
5 Department of Energy High-End Computing Revi-
6 talization Act of 2004 (15 U.S.C. 5541 et seq.).

7 (2) GOAL.—The Secretary shall carry out the
8 program with the goal of supporting departmental
9 missions, and providing the high-performance com-
10 putational, networking, and workforce resources,
11 that are required for world leadership in science.

12 (b) HIGH-PERFORMANCE COMPUTING.—Section 203
13 of the High-Performance Computing Act of 1991 (15
14 U.S.C. 5523) is amended to read as follows:

15 **“SEC. 203. DEPARTMENT OF ENERGY ACTIVITIES.**

16 “(a) GENERAL RESPONSIBILITIES.—As part of the
17 Program described in title I, the Secretary of Energy
18 shall—

19 “(1) conduct and support basic and applied re-
20 search in high-performance computing and net-
21 working to support fundamental research in science
22 and engineering disciplines related to energy applica-
23 tions; and

24 “(2) provide computing and networking infra-
25 structure support, including—

1 “(A) the provision of high-performance
2 computing systems that are among the most
3 advanced in the world in terms of performance
4 in solving scientific and engineering problems;
5 and

6 “(B) support for advanced software and
7 applications development for science and engi-
8 neering disciplines related to energy applica-
9 tions.

10 “(b) AUTHORIZATION OF APPROPRIATIONS.—There
11 are authorized to be appropriated to the Secretary of En-
12 ergy such sums as are necessary to carry out this sec-
13 tion.”.

14 **SEC. 968. GENOMES TO LIFE PROGRAM.**

15 (a) ESTABLISHMENT.—The Secretary shall carry out
16 a program of research, development, demonstration, and
17 commercial application, to be known as the “Genomes to
18 Life Program”, in microbial and plant systems biology,
19 protein science, and computational biology consistent with
20 the statutory authorities of the Department.

21 (b) PLANNING.—

22 (1) IN GENERAL.—The Secretary shall prepare
23 a program plan that describes how knowledge and
24 capabilities would be developed by the program and
25 applied to missions of the Department relating to

1 energy security, environmental cleanup, and national
2 security.

3 (2) CONSULTATION.—The Secretary shall pre-
4 pare the program plan in consultation with the
5 heads of other Federal agencies that carry out rel-
6 evant technology programs.

7 (3) LONG-TERM GOALS.—In preparing the pro-
8 gram plan, the Secretary shall focus on applying
9 science and technology to achieve the long-term
10 goals of the program, including—

11 (A) contributing to the independence of the
12 United States from foreign energy sources, in-
13 cluding production of hydrogen;

14 (B) converting carbon dioxide to organic
15 carbon;

16 (C) advancing environmental cleanup;

17 (D) providing the science and technology
18 for new biotechnology industries; and

19 (E) improving national security and com-
20 bating bioterrorism.

21 (4) SHORT-TERM GOALS.—In preparing the
22 program plan, the Secretary shall—

23 (A) establish specific short-term goals; and

24 (B) update the goals with the annual
25 budget submission of the Secretary.

1 (c) ADMINISTRATION.—In carrying out the program,
2 the Secretary shall—

3 (1) support individual investigators and multi-
4 disciplinary teams of investigators;

5 (2) subject to subsection (d), develop, plan, con-
6 struct, acquire, or operate special equipment or fa-
7 cilities for the use of investigators conducting re-
8 search, development, demonstration, or commercial
9 application in systems biology and proteomics;

10 (3) support technology transfer activities to
11 benefit industry and other users of systems biology
12 and proteomics; and

13 (4) coordinate activities by the Department
14 with industry and other Federal agencies.

15 (d) GENOMES TO LIFE USER FACILITIES AND AN-
16 CILLARY EQUIPMENT.—

17 (1) IN GENERAL.—Subject to the availability of
18 funds to carry out this subsection, the amounts
19 made available under section 961(b)(4) shall be
20 available for—

21 (A) projects to develop, plan, construct, ac-
22 quire, or operate special equipment, or instru-
23 mentation; or

24 (B) facilities at National Laboratories for
25 investigators conducting research, development,

1 demonstration, and commercial application in
2 systems biology and proteomics and associated
3 biological disciplines.

4 (2) PROJECTS.—Projects under paragraph
5 (1)(A) may include—

6 (A) the identification and characterization
7 of multiprotein complexes;

8 (B) characterization of gene regulatory
9 networks;

10 (C) characterization of the functional rep-
11 ertoire of complex microbial communities in
12 their natural environments at the molecular
13 level; and

14 (D) development of computational methods
15 and capabilities to advance understanding of
16 complex biological systems and predict their be-
17 havior.

18 (3) FACILITIES.—Facilities under paragraph
19 (1)(B) may include facilities, equipment, or instru-
20 mentation for—

21 (A) the production and characterization of
22 proteins;

23 (B) whole proteome analysis;

24 (C) characterization and imaging of molec-
25 ular machines; and

1 (D) analysis and modeling of cellular sys-
2 tems.

3 (4) FACILITIES LOCATION AND MISSION.—The
4 number, location, and mission of facilities under
5 paragraph (1)(B) shall be determined in a plan pro-
6 vided by the Secretary to Congress before the con-
7 struction of any such facility.

8 (5) COLLABORATION.—

9 (A) IN GENERAL.—In carrying out this
10 subsection, the Secretary shall encourage col-
11 laborations among institutions of higher edu-
12 cation, National Laboratories, and industry at
13 facilities.

14 (B) TECHNOLOGY TRANSFER.—All facili-
15 ties under this subsection shall promote tech-
16 nology transfer to other institutions.

17 **SEC. 969. FISSION AND FUSION ENERGY MATERIALS RE-**
18 **SEARCH PROGRAM.**

19 (a) IN GENERAL.—Along with the budget request of
20 the President submitted to Congress for fiscal year 2007,
21 the Secretary shall establish a research and development
22 program on material science issues presented by advanced
23 fission reactors and the fusion energy program of the De-
24 partment.

1 (b) ADMINISTRATION.—In carrying out the program,
2 the Secretary shall develop—

3 (1) a catalog of material properties required for
4 applications described in subsection (a);

5 (2) theoretical models for materials possessing
6 the required properties;

7 (3) benchmark models against existing data;
8 and

9 (4) a roadmap to guide further research and
10 development in the area covered by the program.

11 **SEC. 970. ENERGY-WATER SUPPLY TECHNOLOGIES PRO-**
12 **GRAM.**

13 (a) DEFINITIONS.—In this section:

14 (1) FOUNDATION.—The term “Foundation”
15 means the American Water Works Association Re-
16 search Foundation.

17 (2) INDIAN TRIBE.—The term “Indian tribe”
18 has the meaning given the term in section 4 of the
19 Indian Self-Determination and Education Assistance
20 Act (25 U.S.C. 450b).

21 (3) PROGRAM.—The term “Program” means
22 the Energy-Water Supply Technologies Program es-
23 tablished by subsection (b).

24 (b) ESTABLISHMENT.—There is established, within
25 the Office of Biological and Environmental Research of

1 the Office of Science, a program, to be known as the “En-
2 ergy-Water Supply Technologies Program”, to study—

3 (1) energy-related issues associated with water
4 resources and municipal waterworks; and

5 (2) supply issues related to energy production.

6 (c) PROGRAM AREAS.—In carrying out the Program,
7 the Secretary shall conduct research and development, in-
8 cluding research and development relating to—

9 (1) the arsenic removal program under sub-
10 section (d);

11 (2) the desalination research program under
12 subsection (e);

13 (3) the water and energy sustainability program
14 under subsection (f); and

15 (4) other energy-intensive water supply and
16 treatment technologies and other technologies se-
17 lected by the Secretary.

18 (d) ARSENIC REMOVAL PROGRAM.—

19 (1) IN GENERAL.—As soon as practicable after
20 the date of enactment of this Act, the Secretary
21 shall enter into a contract with the Foundation to
22 use the facilities, institutions, and relationships de-
23 scribed in the matter under the heading “BIOLOGI-
24 CAL AND ENVIRONMENTAL RESEARCH” of title III of
25 Senate Report 107–220 to accompany the Consoli-

1 dated Appropriations Resolution, 2003 (Public Law
2 108–7) to carry out a research program to develop
3 and demonstrate innovative arsenic removal tech-
4 nologies.

5 (2) RESEARCH.—In carrying out the arsenic re-
6 moval program, the Foundation shall, to the max-
7 imum extent practicable, conduct research on means
8 of—

9 (A) reducing energy costs incurred in
10 using arsenic removal technologies;

11 (B) minimizing materials, operating, and
12 maintenance costs incurred in using arsenic re-
13 moval technologies; and

14 (C) minimizing any quantities of waste (es-
15 pecially hazardous waste) that result from use
16 of arsenic removal technologies.

17 (3) DEMONSTRATION PROJECTS.—The Founda-
18 tion shall carry out peer-reviewed research and dem-
19 onstration projects to develop and demonstrate
20 water purification technologies.

21 (4) ADMINISTRATION.—Under the arsenic re-
22 moval program—

23 (A) demonstration projects shall be imple-
24 mented with municipal water system partners
25 to demonstrate the applicability of innovative

1 arsenic removal technologies in areas with dif-
2 ferent water chemistries representative of areas
3 across the United States with arsenic levels
4 near or exceeding the guidelines of the Environ-
5 mental Protection Agency; and

6 (B) not less than 40 percent of the funds
7 of the Department used for demonstration
8 projects under the arsenic removal program
9 shall be expended on projects focused on the
10 needs of and in partnership with rural commu-
11 nities or Indian tribes.

12 (5) EVALUATIONS; TECHNOLOGY TRANSFER.—
13 The Foundation shall develop evaluations of cost ef-
14 fectiveness of arsenic removal technologies used in
15 the program and an education, training, and tech-
16 nology transfer component for the program.

17 (6) COORDINATION.—The Secretary shall con-
18 sult with the Administrator of the Environmental
19 Protection Agency to ensure that activities under the
20 arsenic removal program are coordinated with ap-
21 propriate programs of the Environmental Protection
22 Agency and other Federal agencies, State programs,
23 and academia.

24 (7) REPORTS.—Not later than 1 year after the
25 date of commencement of the arsenic removal pro-

1 gram and annually thereafter, the Secretary shall
2 submit to Congress a report on the results of the ar-
3 senic removal program.

4 (e) DESALINATION PROGRAM.—

5 (1) IN GENERAL.—The Secretary, in coopera-
6 tion with the Commissioner of Reclamation, shall
7 carry out a desalination research program in accord-
8 ance with the desalination technology progress plan
9 developed under the matter under the heading
10 “WATER AND RELATED RESOURCES” under the
11 heading “BUREAU OF RECLAMATION” of title II of
12 the Energy and Water Development Appropriations
13 Act, 2002 (115 Stat. 498) and described in Senate
14 Report 107–39 to accompany S. 1171 (107th Con-
15 gress).

16 (2) ADMINISTRATION.—The desalination pro-
17 gram shall—

18 (A) draw on the national laboratory part-
19 nership established with the Bureau of Rec-
20 lamation to develop the national Desalination
21 and Water Purification Technology Roadmap
22 for next-generation desalination technology re-
23 leased in January 2003;

24 (B) focus on research relating to, and de-
25 velopment and demonstration of, technologies

1 that are appropriate for use in desalinating
2 brackish groundwater, wastewater, and other
3 saline water supplies and disposal of residual
4 brine or salt; and

5 (C) consider the use of renewable energy
6 sources.

7 (3) CONSTRUCTION PROJECTS.—Under the de-
8 salination program, funds made available for the
9 program may be used for construction projects, in-
10 cluding completion of the National Desalination Re-
11 search Center for brackish groundwater and ongoing
12 facility operational costs.

13 (4) STEERING COMMITTEE.—

14 (A) ESTABLISHMENT.—The Secretary and
15 the Commissioner of Reclamation shall jointly
16 establish a steering committee for the desalina-
17 tion program.

18 (B) CHAIR.—The steering committee shall
19 be jointly chaired by—

20 (i) 1 representative from the Pro-
21 gram; and

22 (ii) 1 representative from the Bureau
23 of Reclamation.

24 (f) WATER AND ENERGY SUSTAINABILITY PRO-
25 GRAM.—

1 (1) IN GENERAL.—The Secretary shall carry
2 out a research program to develop technologies to
3 assist in ensuring that sufficient quantities of water
4 are available to meet present and future require-
5 ments.

6 (2) ASSESSMENTS.—Under the program and in
7 collaboration with other programs within the De-
8 partment (including programs within the Offices of
9 Fossil Energy and Energy Efficiency and Renewable
10 Energy), the Secretary of the Interior, the Corps of
11 Engineers, the Environmental Protection Agency,
12 the Department of Commerce, the Department of
13 Defense, State agencies, nongovernmental agencies,
14 and academia, the Secretary shall assess the current
15 state of knowledge and program activities
16 concerning—

17 (A) future water resources needed to sup-
18 port energy production within the United
19 States, including the water needs for hydro-
20 power and thermo-electric power generation;

21 (B) future energy resources needed to sup-
22 port development of water purification and
23 treatment, including desalination and long-dis-
24 tance water conveyance;

1 (C) reuse and treatment of water produced
2 as a byproduct of oil and gas extraction;

3 (D) use of impaired and nontraditional
4 water supplies for energy production and other
5 uses; and

6 (E) technologies to reduce water use in en-
7 ergy production.

8 (3) TOOLS.—In addition to the assessments
9 conducted under paragraph (2), the Secretary
10 shall—

11 (A) develop a research plan that defines
12 the scientific and technology development needs
13 and activities required to support—

14 (i) long-term water needs and plan-
15 ning for energy sustainability;

16 (ii) use of impaired water for energy
17 production and other uses; and

18 (iii) reduction of water use in energy
19 production;

20 (B) carry out the research plan required
21 under subparagraph (A), including development
22 of numerical models, decision analysis tools,
23 economic analysis tools, databases, planning
24 methodologies, and strategies;

1 (C) implement at least 3 planning dem-
2 onstration projects using the models, tools, and
3 planning approaches developed under subpara-
4 graph (B) and assess the viability of those tools
5 on the scale of river basins with at least 1 dem-
6 onstration involving an international border;
7 and

8 (D) transfer those tools to other Federal
9 agencies, State agencies, nonprofit organiza-
10 tions, industry, and academia for use in their
11 energy and water sustainability efforts.

12 (4) REPORT.—Not later than 1 year after the
13 date of enactment of this Act, the Secretary shall
14 submit to Congress a report on the water and en-
15 ergy sustainability program that—

16 (A) describes the research elements de-
17 scribed under paragraph (2); and

18 (B) makes recommendations for a manage-
19 ment structure that optimizes use of Federal
20 resources and programs.

21 (g) COST SHARING.—

22 (1) RESEARCH PROJECTS.—A research project
23 under this section shall not require cost-sharing.

24 (2) DEMONSTRATION PROJECTS.—Each dem-
25 onstration project carried out under the Program

1 shall be carried out in accordance with the cost-shar-
2 ing requirements of section [1002].

3 **SEC. 971. SPALLATION NEUTRON SOURCE.**

4 (a) DEFINITIONS.—In this section:

5 (1) SING.—The term “SING” means the
6 Spallation Neutron Source Instruments Next Gen-
7 eration major item of equipment.

8 (2) SNS POWER UPGRADE.—The term “SNS
9 power upgrade” means the Spallation Neutron
10 Source power upgrade described in the 20-year fa-
11 cilities plan of the Office of Science of the Depart-
12 ment.

13 (3) SNS SECOND TARGET STATION.—The term
14 “SNS second target station” the Spallation Neutron
15 Source second target station described in the 20-
16 year facilities plan of the Office of Science of the
17 Department.

18 (4) SPALLATION NEUTRON SOURCE FACILITY.—
19 The terms “Spallation Neutron Source Facility” and
20 “Facility” mean the completed Spallation Neutron
21 Source scientific user facility located at Oak Ridge
22 National Laboratory, Oak Ridge, Tennessee.

23 (5) SPALLATION NEUTRON SOURCE PROJECT.—
24 The terms “Spallation Neutron Source Project” and
25 “Project” means Department Project 99–E–334,

1 Oak Ridge National Laboratory, Oak Ridge, Ten-
2 nessee.

3 (b) SPALLATION NEUTRON SOURCE PROJECT.—

4 (1) IN GENERAL.—The Secretary shall submit
5 to Congress, as part of the annual budget request of
6 the President submitted to Congress, a report on
7 progress on the Spallation Neutron Source Project.

8 (2) CONTENTS.—The report shall include for
9 the Project—

10 (A) a description of the achievement of
11 milestones;

12 (B) a comparison of actual costs to esti-
13 mated costs; and

14 (C) any changes in estimated Project costs
15 or schedule.

16 (c) SPALLATION NEUTRON SOURCE FACILITY
17 PLAN.—

18 (1) IN GENERAL.—The Secretary shall develop
19 an operational plan for the Spallation Neutron
20 Source Facility that ensures that the Facility is em-
21 ployed to the full capability of the Facility in sup-
22 port of the study of advanced materials, nanoscience,
23 and other missions of the Office of Science of the
24 Department.

25 (2) PLAN.—The operational plan shall—

1 (A) include a plan for the operation of an
2 effective scientific user program that—

3 (i) is based on peer review of pro-
4 posals submitted for use of the Facility;

5 (ii) includes scientific and technical
6 support to ensure that external users, in-
7 cluding researchers based at institutions of
8 higher education, are able to make full use
9 of a variety of high quality scientific in-
10 struments; and

11 (iii) phases in systems upgrades to en-
12 sure that the Facility remains at the fore-
13 front of international scientific endeavors
14 in the field of the Facility throughout the
15 operating life of the Facility;

16 (B) include an ongoing program to develop
17 new instruments that builds on the high per-
18 formance neutron source and that allows neu-
19 tron scattering techniques to be applied to a
20 growing range of scientific problems and dis-
21 ciplines; and

22 (C) address the status of and, to the max-
23 imum extent practicable, costs and schedules
24 for—

- 1 (i) full user mode operations of the
2 Facility;
- 3 (ii) instrumentation built at the Facil-
4 ity during the operating phase through full
5 use of the experimental hall, including the
6 SING;
- 7 (iii) the SNS power upgrade; and
8 (iv) the SNS second target station.

9 (d) AUTHORIZATION OF APPROPRIATIONS.—

10 (1) SPALLATION NEUTRON SOURCE PROJECT.—

11 There is authorized to be appropriated to carry out
12 the Spallation Neutron Source Project for the life-
13 time of the Project \$1,411,700,000 for total project
14 costs, of which—

15 (A) \$1,192,700,000 shall be used for the
16 costs of construction; and

17 (B) \$219,000,000 shall be used for other
18 Project costs.

19 (2) SPALLATION NEUTRON SOURCE FACILITY.—

20 (A) IN GENERAL.—Except as provided in
21 subparagraph (B), there is authorized to be ap-
22 propriated for the Spallation Neutron Source
23 Facility for—

24 (i) the SING, \$75,000,000 for fiscal
25 year 2006; and

1 (ii) the SNS power upgrade,
2 \$160,000,000 for each of fiscal years 2007
3 and 2008.

4 (B) INSUFFICIENT STOCKPILES OF HEAVY
5 WATER.—If stockpiles of heavy water of the
6 Department are insufficient to meet the needs
7 of the Facility, there is authorized to be appro-
8 priated for the Facility \$172,000,000 for fiscal
9 year 2007.

10 **Subtitle G—Energy and** 11 **Environment**

12 **SEC. 981. WESTERN HEMISPHERE ENERGY COOPERATION.**

13 (a) PROGRAM.—The Secretary shall carry out a pro-
14 gram to promote cooperation on energy issues with coun-
15 tries of the Western Hemisphere.

16 (b) ACTIVITIES.—Under the program, the Secretary
17 shall fund activities to work with countries of the Western
18 Hemisphere to—

19 (1) increase the production of energy supplies;

20 (2) improve energy efficiency; and

21 (3) assist in the development and transfer of
22 energy supply and efficiency technologies that would
23 have a beneficial impact on world energy markets.

24 (c) PARTICIPATION BY INSTITUTIONS OF HIGHER
25 EDUCATION.—To the extent practicable, the Secretary

1 shall carry out the program under this section with the
2 participation of institutions of higher education so as to
3 take advantage of the acceptance of institutions of higher
4 education by countries of the Western Hemisphere as
5 sources of unbiased technical and policy expertise when
6 assisting the Secretary in—

7 (1) evaluating new technologies;

8 (2) resolving technical issues;

9 (3) working with those countries in the develop-
10 ment of new policies; and

11 (4) training policymakers, particularly in the
12 case of universities that involve the participation of
13 minority students, such as—

14 (A) Hispanic-serving institutions; and

15 (B) part B institutions.

16 (d) AUTHORIZATION OF APPROPRIATIONS.—There
17 are authorized to be appropriated to carry out this
18 section—

19 (1) \$10,000,000 for fiscal year 2006;

20 (2) \$13,000,000 for fiscal year 2007; and

21 (3) \$16,000,000 for fiscal year 2008.