

[CHAIRMEN'S PROPOSED CONFERENCE REPORT]

NOVEMBER 17, 2003

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

3 **SEC. 901. GOALS.**

4 (a) IN GENERAL.—The Secretary shall conduct a bal-
5 anced set of programs of energy research, development,
6 demonstration, and commercial application to support
7 Federal energy policy and programs by the Department.

8 Such programs shall be focused on—

9 (1) increasing the efficiency of all energy inten-
10 sive sectors through conservation and improved tech-
11 nologies;

12 (2) promoting diversity of energy supply;

13 (3) decreasing the Nation's dependence on for-
14 eign energy supplies;

15 (4) improving United States energy security;
16 and

17 (5) decreasing the environmental impact of en-
18 ergy-related activities.

19 (b) GOALS.—The Secretary shall publish measurable
20 5-year cost and performance-based goals with each annual
21 budget submission in at least the following areas:

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

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

3 (3) Renewable energy technologies including
4 wind power, photovoltaics, solar thermal systems,
5 geothermal energy, hydrogen-fueled systems, bio-
6 mass-based systems, biofuels, and hydropower.

7 (4) Fossil energy including power generation,
8 onshore and offshore oil and gas resource recovery,
9 and transportation.

10 (5) Nuclear energy including programs for ex-
11 isting and advanced reactors and education of future
12 specialists.

13 (c) PUBLIC COMMENT.—The Secretary shall provide
14 mechanisms for input on the annually published goals
15 from industry, university, and other public sources.

16 (d) EFFECT OF GOALS.—

17 (1) NO NEW AUTHORITY OR REQUIREMENT.—
18 Nothing in subsection (a) or the annually published
19 goals shall—

20 (A) create any new—

21 (i) authority for any Federal agency;

22 or

23 (ii) requirement for any other person;

1 (B) be used by a Federal agency to sup-
2 port the establishment of regulatory standards
3 or regulatory requirements; or

4 (C) alter the authority of the Secretary to
5 make grants or other awards.

6 (2) NO LIMITATION.—Nothing in this sub-
7 section shall be construed to limit the authority of
8 the Secretary to impose conditions on grants or
9 other awards based on the goals in subsection (a) or
10 any subsequent modification thereto.

11 **SEC. 902. DEFINITIONS.**

12 For purposes of this title:

13 (1) DEPARTMENT.—The term “Department”
14 means the Department of Energy.

15 (2) DEPARTMENTAL MISSION.—The term “de-
16 partmental mission” means any of the functions
17 vested in the Secretary of Energy by the Depart-
18 ment of Energy Organization Act (42 U.S.C. 7101
19 et seq.) or other law.

20 (3) INSTITUTION OF HIGHER EDUCATION.—The
21 term “institution of higher education” has the
22 meaning given that term in section 101(a) of the
23 Higher Education Act of 1965 (20 U.S.C. 1001(a)).

1 (4) NATIONAL LABORATORY.—The term “Na-
2 tional Laboratory” means any of the following lab-
3 oratories owned by the Department:

4 (A) Ames Laboratory.

5 (B) Argonne National Laboratory.

6 (C) Brookhaven National Laboratory.

7 (D) Fermi National Accelerator Labora-
8 tory.

9 (E) Idaho National Engineering and Envi-
10 ronmental Laboratory.

11 (F) Lawrence Berkeley National Labora-
12 tory.

13 (G) Lawrence Livermore National Labora-
14 tory.

15 (H) Los Alamos National Laboratory.

16 (I) National Energy Technology Labora-
17 tory.

18 (J) National Renewable Energy Labora-
19 tory.

20 (K) Oak Ridge National Laboratory.

21 (L) Pacific Northwest National Labora-
22 tory.

23 (M) Princeton Plasma Physics Laboratory.

24 (N) Sandia National Laboratories.

25 (O) Stanford Linear Accelerator Center.

1 (P) Thomas Jefferson National Accelerator
2 Facility.

3 (5) NONMILITARY ENERGY LABORATORY.—The
4 term “nonmilitary energy laboratory” means the lab-
5 oratories listed in paragraph (4), except for those
6 listed in subparagraphs (G), (H), and (N).

7 (6) SECRETARY.—The term “Secretary” means
8 the Secretary of Energy.

9 (7) SINGLE-PURPOSE RESEARCH FACILITY.—
10 The term “single-purpose research facility” means
11 any of the primarily single-purpose entities owned by
12 the Department or any other organization of the De-
13 partment designated by the Secretary.

14 **Subtitle A—Energy Efficiency**

15 **SEC. 904. ENERGY EFFICIENCY.**

16 (a) IN GENERAL.—The following sums are author-
17 ized to be appropriated to the Secretary for energy effi-
18 ciency and conservation research, development, dem-
19 onstration, and commercial application activities, includ-
20 ing activities authorized under this subtitle:

21 (1) For fiscal year 2004, \$616,000,000.

22 (2) For fiscal year 2005, \$695,000,000.

23 (3) For fiscal year 2006, \$772,000,000.

24 (4) For fiscal year 2007, \$865,000,000.

25 (5) For fiscal year 2008, \$920,000,000.

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

3 (1) For activities under section 905—

4 (A) for fiscal year 2004, \$20,000,000;

5 (B) for fiscal year 2005, \$30,000,000;

6 (C) for fiscal year 2006, \$50,000,000;

7 (D) for fiscal year 2007, \$50,000,000; and

8 (E) for fiscal year 2008, \$50,000,000.

9 (2) For activities under section 907—

10 (A) for fiscal year 2004, \$4,000,000; and

11 (B) for each of fiscal years 2005 through
12 2008, \$7,000,000.

13 (3) For activities under section 908—

14 (A) for fiscal year 2004, \$20,000,000;

15 (B) for fiscal year 2005, \$25,000,000;

16 (C) for fiscal year 2006, \$30,000,000;

17 (D) for fiscal year 2007, \$35,000,000; and

18 (E) for fiscal year 2008, \$40,000,000.

19 (4) For activities under section 909,
20 \$2,000,000 for each of fiscal years 2005 through
21 2008.

22 (c) EXTENDED AUTHORIZATION.—There are author-
23 ized to be appropriated to the Secretary for activities
24 under section 905, \$50,000,000 for each of fiscal years
25 2009 through 2013.

1 (d) LIMITATION ON USE OF FUNDS.—None of the
2 funds authorized to be appropriated under this section
3 may be used for—

4 (1) the issuance and implementation of energy
5 efficiency regulations;

6 (2) the Weatherization Assistance Program
7 under part A of title IV of the Energy Conservation
8 and Production Act (42 U.S.C. 6861 et seq.);

9 (3) the State Energy Program under part D of
10 title III of the Energy Policy and Conservation Act
11 (42 U.S.C. 6321 et seq.); or

12 (4) the Federal Energy Management Program
13 under part 3 of title V of the National Energy Con-
14 servation Policy Act (42 U.S.C. 8251 et seq.).

15 **SEC. 905. NEXT GENERATION LIGHTING INITIATIVE.**

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

22 (b) OBJECTIVES.—The objectives of the initiative
23 shall be to develop advanced solid-state organic and inor-
24 ganic lighting technologies based on white light emitting
25 diodes that, compared to incandescent and fluorescent

1 lighting technologies, are longer lasting; more energy-effi-
2 cient; and cost-competitive, and have less environmental
3 impact.

4 (c) INDUSTRY ALLIANCE.—The Secretary shall, not
5 later than 3 months after the date of enactment of this
6 section, competitively select an Industry Alliance to rep-
7 resent participants that are private, for-profit firms which,
8 as a group, are broadly representative of United States
9 solid state lighting research, development, infrastructure,
10 and manufacturing expertise as a whole.

11 (d) RESEARCH.—

12 (1) IN GENERAL.—The Secretary shall carry
13 out the research activities of the Next Generation
14 Lighting Initiative through competitively awarded
15 grants to researchers, including Industry Alliance
16 participants, National Laboratories, and institutions
17 of higher education.

18 (2) ASSISTANCE FROM THE INDUSTRY ALLI-
19 ANCE.—The Secretary shall annually solicit from the
20 Industry Alliance—

21 (A) comments to identify solid-state light-
22 ing technology needs;

23 (B) assessment of the progress of the Ini-
24 tiative's research activities; and

1 (C) assistance in annually updating solid-
2 state lighting technology roadmaps.

3 (3) AVAILABILITY OF INFORMATION AND ROAD-
4 MAPS.—The information and roadmaps under para-
5 graph (2) shall be available to the public and public
6 response shall be solicited by the Secretary.

7 (e) DEVELOPMENT, DEMONSTRATION, AND COMMER-
8 CIAL APPLICATION.—The Secretary shall carry out a de-
9 velopment, demonstration, and commercial application
10 program for the Next Generation Lighting Initiative
11 through competitively selected awards. The Secretary may
12 give preference to participants of the Industry Alliance se-
13 lected pursuant to subsection (c).

14 (f) INTELLECTUAL PROPERTY.—The Secretary may
15 require, in accordance with the authorities provided in sec-
16 tion 202(a)(ii) of title 35, United States Code, section 152
17 of the Atomic Energy Act of 1954 (42 U.S.C. 2182), and
18 section 9 of the Federal Nonnuclear Energy Research and
19 Development Act of 1974 (42 U.S.C. 5908), that—

20 (1) for any new invention resulting from activi-
21 ties under subsection (d)—

22 (A) the Industry Alliance members that
23 are active participants in research, development,
24 and demonstration activities related to the ad-
25 vanced solid-state lighting technologies that are

1 the subject of this section shall be granted first
2 option to negotiate with the invention owner
3 nonexclusive licenses and royalties for uses of
4 the invention related to solid-state lighting on
5 terms that are reasonable under the cir-
6 cumstances; and

7 (B)(i) for 1 year after a United States pat-
8 ent is issued for the invention, the patent hold-
9 er shall not negotiate any license or royalty
10 with any entity that is not a participant in the
11 Industry Alliance described in subparagraph
12 (A); and

13 (ii) during the year described in clause (i),
14 the invention owner shall negotiate nonexclusive
15 licenses and royalties in good faith with any in-
16 terested participant in the Industry Alliance de-
17 scribed in subparagraph (A); and

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

21 (g) NATIONAL ACADEMY REVIEW.—The Secretary
22 shall enter into an arrangement with the National Acad-
23 emy of Sciences to conduct periodic reviews of the Next
24 Generation Lighting Initiative. The Academy shall review
25 the research priorities, technical milestones, and plans for

1 technology transfer and progress towards achieving them.
2 The Secretary shall consider the results of such reviews
3 in evaluating the information obtained under subsection
4 (d)(2).

5 (h) DEFINITIONS.—As used in this section:

6 (1) ADVANCED SOLID-STATE LIGHTING.—The
7 term “advanced solid-state lighting” means a
8 semiconducting device package and delivery system
9 that produces white light using externally applied
10 voltage.

11 (2) RESEARCH.—The term “research” includes
12 research on the technologies, materials, and manu-
13 facturing processes required for white light emitting
14 diodes.

15 (3) INDUSTRY ALLIANCE.—The term “Industry
16 Alliance” means an entity selected by the Secretary
17 under subsection (c).

18 (4) WHITE LIGHT EMITTING DIODE.—The term
19 “white light emitting diode” means a
20 semiconducting package, utilizing either organic or
21 inorganic materials, that produces white light using
22 externally applied voltage.

23 **SEC. 906. NATIONAL BUILDING PERFORMANCE INITIATIVE.**

24 (a) INTERAGENCY GROUP.—Not later than 90 days
25 after the date of enactment of this Act, the Director of

1 the Office of Science and Technology Policy shall establish
2 an interagency group to develop, in coordination with the
3 advisory committee established under subsection (e), a
4 National Building Performance Initiative (in this section
5 referred to as the “Initiative”). The interagency group
6 shall be co-chaired by appropriate officials of the Depart-
7 ment and the Department of Commerce, who shall jointly
8 arrange for the provision of necessary administrative sup-
9 port to the group.

10 (b) INTEGRATION OF EFFORTS.—The Initiative,
11 working with the National Institute of Building Sciences,
12 shall integrate Federal, State, and voluntary private sector
13 efforts to reduce the costs of construction, operation,
14 maintenance, and renovation of commercial, industrial, in-
15 stitutional, and residential buildings.

16 (c) PLAN.—Not later than 1 year after the date of
17 enactment of this Act, the interagency group shall submit
18 to Congress a plan for carrying out the appropriate Fed-
19 eral role in the Initiative. The plan shall include—

20 (1) research, development, demonstration, and
21 commercial application of systems and materials for
22 new construction and retrofit relating to the building
23 envelope and building system components; and

24 (2) the collection, analysis, and dissemination of
25 research results and other pertinent information on

1 enhancing building performance to industry, govern-
2 ment entities, and the public.

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

7 (e) ADVISORY COMMITTEE.—

8 (1) ESTABLISHMENT.—The Secretary, in con-
9 sultation with the Secretary of Commerce and the
10 Director of the Office of Science and Technology
11 Policy, shall establish an advisory committee to—

12 (A) analyze and provide recommendations
13 on potential private sector roles and participa-
14 tion in the Initiative; and

15 (B) review and provide recommendations
16 on the plan described in subsection (c).

17 (2) MEMBERSHIP.—Membership of the advisory
18 committee shall include representatives with a broad
19 range of appropriate expertise, including expertise
20 in—

21 (A) building research and technology;

22 (B) architecture, engineering, and building
23 materials and systems; and

24 (C) the residential, commercial, and indus-
25 trial sectors of the construction industry.

1 (f) CONSTRUCTION.—Nothing in this section provides
2 any Federal agency with new authority to regulate build-
3 ing performance.

4 **SEC. 907. SECONDARY ELECTRIC VEHICLE BATTERY USE**
5 **PROGRAM.**

6 (a) DEFINITIONS.—For purposes of this section:

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

11 (2) BATTERY.—The term “battery” means an
12 energy storage device that previously has been used
13 to provide motive power in a vehicle powered in
14 whole or in part by electricity.

15 (b) PROGRAM.—The Secretary shall establish and
16 conduct a research, development, demonstration, and com-
17 mercial application program for the secondary use of bat-
18 teries if the Secretary finds that there are sufficient num-
19 bers of such batteries to support the program. The pro-
20 gram shall be—

21 (1) designed to demonstrate the use of batteries
22 in secondary applications, including utility and com-
23 mercial power storage and power quality;

24 (2) structured to evaluate the performance, in-
25 cluding useful service life and costs, of such bat-

1 teries in field operations, and the necessary sup-
2 porting infrastructure, including reuse and disposal
3 of batteries; and

4 (3) coordinated with ongoing secondary battery
5 use programs at the National Laboratories and in
6 industry.

7 (c) SOLICITATION.—Not later than 180 days after
8 the date of enactment of this Act, if the Secretary finds
9 under subsection (b) that there are sufficient numbers of
10 batteries to support the program, the Secretary shall so-
11 licit proposals to demonstrate the secondary use of bat-
12 teries and associated equipment and supporting infra-
13 structure in geographic locations throughout the United
14 States. The Secretary may make additional solicitations
15 for proposals if the Secretary determines that such solici-
16 tations are necessary to carry out this section.

17 (d) SELECTION OF PROPOSALS.—

18 (1) IN GENERAL.—The Secretary shall, not
19 later than 90 days after the closing date established
20 by the Secretary for receipt of proposals under sub-
21 section (c), select up to 5 proposals which may re-
22 ceive financial assistance under this section, subject
23 to the availability of appropriations.

24 (2) DIVERSITY; ENVIRONMENTAL EFFECT.—In
25 selecting proposals, the Secretary shall consider di-

1 iversity of battery type, geographic and climatic di-
2 iversity, and 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 authorized for the program under this section.

7 (4) OPTIMIZATION OF FEDERAL RESOURCES.—
8 The Secretary shall consider the extent of involve-
9 ment of State or local government and other persons
10 in each demonstration project to optimize use of
11 Federal resources.

12 (5) OTHER CRITERIA.—The Secretary may con-
13 sider such other criteria as the Secretary considers
14 appropriate.

15 (e) CONDITIONS.—The Secretary shall require that—

16 (1) relevant information be provided to the De-
17 partment, the users of the batteries, the proposers,
18 and the battery manufacturers;

19 (2) the proposer provide at least 50 percent of
20 the costs associated with the proposal; and

21 (3) the proposer provide to the Secretary such
22 information regarding the disposal of the batteries
23 as the Secretary may require to ensure that the pro-
24 poser disposes of the batteries in accordance with
25 applicable law.

1 **SEC. 908. ENERGY EFFICIENCY SCIENCE INITIATIVE.**

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

11 (b) REPORT.—The Secretary shall submit to Con-
12 gress, along with the President's annual budget request
13 under section 1105(a) of title 31, United States Code, a
14 report on the activities of the Energy Efficiency Science
15 Initiative, including a description of the process used to
16 award the funds and an explanation of how the research
17 relates to energy efficiency.

18 **SEC. 909. ELECTRIC MOTOR CONTROL TECHNOLOGY.**

19 The Secretary shall conduct a research, development,
20 demonstration, and commercial application program on
21 advanced control devices to improve the energy efficiency
22 of electric motors used in heating, ventilation, air condi-
23 tioning, and comparable systems.

1 **SEC. 910. ADVANCED ENERGY TECHNOLOGY TRANSFER**
2 **CENTERS.**

3 (a) GRANTS.—Not later than 18 months after the
4 date of enactment of this Act, the Secretary shall make
5 grants to nonprofit institutions, State and local govern-
6 ments, or universities (or consortia thereof), to establish
7 a geographically dispersed network of Advanced Energy
8 Technology Transfer Centers, to be located in areas the
9 Secretary determines have the greatest need of the serv-
10 ices of such Centers.

11 (b) ACTIVITIES.—

12 (1) IN GENERAL.—Each Center shall operate a
13 program to encourage demonstration and commer-
14 cial application of advanced energy methods and
15 technologies through education and outreach to
16 building and industrial professionals, and to other
17 individuals and organizations with an interest in ef-
18 ficient energy use.

19 (2) ADVISORY PANEL.—Each Center shall es-
20 tablish an advisory panel to advise the Center on
21 how best to accomplish the activities under para-
22 graph (1).

23 (c) APPLICATION.—A person seeking a grant under
24 this section shall submit to the Secretary an application
25 in such form and containing such information as the Sec-
26 retary may require. The Secretary may award a grant

1 under this section to an entity already in existence if the
2 entity is otherwise eligible under this section.

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

6 (1) The ability of the applicant to carry out the
7 activities in subsection (b).

8 (2) The extent to which the applicant will co-
9 ordinate the activities of the Center with other enti-
10 ties, such as State and local governments, utilities,
11 and educational and research institutions.

12 (e) MATCHING FUNDS.—The Secretary shall require
13 a non-Federal matching requirement of at least 50 percent
14 of the costs of establishing and operating each Center.

15 (f) ADVISORY COMMITTEE.—The Secretary shall es-
16 tablish an advisory committee to advise the Secretary on
17 the establishment of Centers under this section. The advi-
18 sory committee shall be composed of individuals with ex-
19 pertise in the area of advanced energy methods and tech-
20 nologies, including at least 1 representative from—

21 (1) State or local energy offices;

22 (2) energy professionals;

23 (3) trade or professional associations;

24 (4) architects, engineers, or construction profes-
25 sionals;

- 1 (5) manufacturers;
- 2 (6) the research community; and
- 3 (7) nonprofit energy or environmental organiza-
- 4 tions.

5 (g) DEFINITIONS.—For purposes of this section:

6 (1) ADVANCED ENERGY METHODS AND TECH-

7 NOLOGIES.—The term “advanced energy methods

8 and technologies” means all methods and tech-

9 nologies that promote energy efficiency and con-

10 servation, including distributed generation tech-

11 nologies, and life-cycle analysis of energy use.

12 (2) CENTER.—The term “Center” means an

13 Advanced Energy Technology Transfer Center estab-

14 lished pursuant to this section.

15 (3) DISTRIBUTED GENERATION.—The term

16 “distributed generation” means an electric power

17 generation facility that is designed to serve retail

18 electric consumers at or near the facility site.

19 **Subtitle B—Distributed Energy and**

20 **Electric Energy Systems**

21 **SEC. 911. DISTRIBUTED ENERGY AND ELECTRIC ENERGY**

22 **SYSTEMS.**

23 (a) IN GENERAL.—The following sums are author-

24 ized to be appropriated to the Secretary for distributed

1 energy and electric energy systems activities, including ac-
2 tivities authorized under this subtitle:

3 (1) For fiscal year 2004, \$190,000,000.

4 (2) For fiscal year 2005, \$200,000,000.

5 (3) For fiscal year 2006, \$220,000,000.

6 (4) For fiscal year 2007, \$240,000,000.

7 (5) For fiscal year 2008, \$260,000,000.

8 (b) MICRO-COGENERATION ENERGY TECH-
9 NOLOGY.—From amounts authorized under subsection
10 (a), \$20,000,000 for each of fiscal years 2004 and 2005
11 is authorized for activities under section 914.

12 **SEC. 912. HYBRID DISTRIBUTED POWER SYSTEMS.**

13 (a) REQUIREMENT.—Not later than 1 year after the
14 date of enactment of this Act, the Secretary shall develop
15 and transmit to Congress a strategy for a comprehensive
16 research, development, demonstration, and commercial ap-
17 plication program to develop hybrid distributed power sys-
18 tems that combine—

19 (1) 1 or more renewable electric power genera-
20 tion technologies of 10 megawatts or less located
21 near the site of electric energy use; and

22 (2) nonintermittent electric power generation
23 technologies suitable for use in a distributed power
24 system.

25 (b) CONTENTS.—The strategy shall—

1 (1) identify the needs best met with such hybrid
2 distributed power systems and the technological bar-
3 riers to the use of such systems;

4 (2) provide for the development of methods to
5 design, test, integrate into systems, and operate
6 such hybrid distributed power systems;

7 (3) include, as appropriate, research, develop-
8 ment, demonstration, and commercial application on
9 related technologies needed for the adoption of such
10 hybrid distributed power systems, including energy
11 storage devices and environmental control tech-
12 nologies;

13 (4) include research, development, demonstra-
14 tion, and commercial application of interconnection
15 technologies for communications and controls of dis-
16 tributed generation architectures, particularly tech-
17 nologies promoting real-time response to power mar-
18 ket information and physical conditions on the elec-
19 trical grid; and

20 (5) describe how activities under the strategy
21 will be integrated with other research, development,
22 demonstration, and commercial application activities
23 supported by the Department related to electric
24 power technologies.

1 **SEC. 913. HIGH POWER DENSITY INDUSTRY PROGRAM.**

2 The Secretary shall establish a comprehensive re-
3 search, development, demonstration, and commercial ap-
4 plication program to improve energy efficiency of high
5 power density facilities, including data centers, server
6 farms, and telecommunications facilities. Such program
7 shall consider technologies that provide significant im-
8 provement in thermal controls, metering, load manage-
9 ment, peak load reduction, or the efficient cooling of elec-
10 tronics.

11 **SEC. 914. MICRO-COGENERATION ENERGY TECHNOLOGY.**

12 The Secretary shall make competitive, merit-based
13 grants to consortia for the development of micro-cogenera-
14 tion energy technology. The consortia shall explore—

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

17 (2) the use of excess power to operate other ap-
18 pliances within the residence and supply excess gen-
19 erated power to the power grid.

20 **SEC. 915. DISTRIBUTED ENERGY TECHNOLOGY DEM-**
21 **ONSTRATION PROGRAM.**

22 The Secretary, within the sums authorized under sec-
23 tion 911(a), may provide financial assistance to coordi-
24 nating consortia of interdisciplinary participants for dem-
25 onstrations designed to accelerate the utilization of dis-
26 tributed energy technologies, such as fuel cells, microtur-

1 bins, reciprocating engines, thermally activated tech-
2 nologies, and combined heat and power systems, in highly
3 energy intensive commercial applications.

4 **SEC. 916. RECIPROCATING POWER.**

5 The Secretary shall conduct a research, development,
6 and demonstration program regarding fuel system optimi-
7 zation and emissions reduction after-treatment tech-
8 nologies for industrial reciprocating engines. Such after-
9 treatment technologies shall use processes that reduce
10 emissions by recirculating exhaust gases and shall be de-
11 signed to be retrofitted to any new or existing diesel or
12 natural gas engine used for power generation, peaking
13 power generation, combined heat and power, or compres-
14 sion.

15 **Subtitle C—Renewable Energy**

16 **SEC. 918. RENEWABLE ENERGY.**

17 (a) IN GENERAL.—The following sums are author-
18 ized to be appropriated to the Secretary for renewable en-
19 ergy research, development, demonstration, and commer-
20 cial application activities, including activities authorized
21 under this subtitle:

- 22 (1) For fiscal year 2004, \$480,000,000.
23 (2) For fiscal year 2005, \$550,000,000.
24 (3) For fiscal year 2006, \$610,000,000.
25 (4) For fiscal year 2007, \$659,000,000.

1 (5) For fiscal year 2008, \$710,000,000.

2 (b) BIOENERGY.—From the amounts authorized
3 under subsection (a), the following sums are authorized
4 to be appropriated to carry out section 919:

5 (1) For fiscal year 2004, \$135,425,000.

6 (2) For fiscal year 2005, \$155,600,000.

7 (3) For fiscal year 2006, \$167,650,000.

8 (4) For fiscal year 2007, \$180,000,000.

9 (5) For fiscal year 2008, \$192,000,000.

10 (c) CONCENTRATING SOLAR POWER.—From
11 amounts authorized under subsection (a), the following
12 sums are authorized to be appropriated to carry out sec-
13 tion 920:

14 (1) For fiscal year 2004, \$20,000,000.

15 (2) For fiscal year 2005, \$40,000,000.

16 (3) For each of fiscal years 2006, 2007 and
17 2008, \$50,000,000.

18 (d) PUBLIC BUILDINGS.—From the amounts author-
19 ized under subsection (a), \$30,000,000 for each of the fis-
20 cal years 2004 through 2008 are authorized to be appro-
21 priated to carry out section 922.

22 (e) LIMITS ON USE OF FUNDS.—

23 (1) NO FUNDS FOR RENEWABLE SUPPORT AND
24 IMPLEMENTATION.—None of the funds authorized to

1 be appropriated under this section may be used for
2 Renewable Support and Implementation.

3 (2) GRANTS.—Of the funds authorized under
4 subsection (b), not less than \$5,000,000 for each fis-
5 cal year shall be made available for grants to His-
6 torically Black Colleges and Universities, Tribal Col-
7 leges, and Hispanic-Serving Institutions.

8 (3) REGIONAL FIELD VERIFICATION PRO-
9 GRAM.—Of the funds authorized under subsection
10 (a), not less than \$4,000,000 for each fiscal year
11 shall be made available for the Regional Field Ver-
12 ification Program of the Department.

13 (4) OFF-STREAM PUMPED STORAGE HYDRO-
14 POWER.—Of the funds authorized under subsection
15 (a), such sums as may be necessary shall be made
16 available for demonstration projects of off-stream
17 pumped storage hydropower.

18 (f) CONSULTATION.—In carrying out this subtitle,
19 the Secretary, in consultation with the Secretary of Agri-
20 culture, shall demonstrate the use of advanced wind power
21 technology, including combined use with coal gasification;
22 biomass; geothermal energy systems; and other renewable
23 energy technologies to assist in delivering electricity to
24 rural and remote locations.

1 **SEC. 919. BIOENERGY PROGRAMS.**

2 (a) DEFINITIONS.—For the purposes of this section:

3 (1) The term “agricultural byproducts” in-
4 cludes waste products, including poultry fat and
5 poultry waste.

6 (2) The term “cellulosic biomass” means any
7 portion of a crop containing lignocellulose or hemi-
8 cellulose, including barley grain, grapeseed, forest
9 thinnings, rice bran, rice hulls, rice straw, soybean
10 matter, and sugarcane bagasse, or any crop grown
11 specifically for the purpose of producing cellulosic
12 feedstocks.

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

16 (1) biopower energy systems;

17 (2) biofuels;

18 (3) bio-based products;

19 (4) integrated biorefineries that may produce
20 biopower, biofuels, and bio-based products;

21 (5) cross-cutting research and development in
22 feedstocks and enzymes; and

23 (6) economic analysis.

24 (c) BIOFUELS AND BIO-BASED PRODUCTS.—The
25 goals of the biofuels and bio-based products programs
26 shall be to develop, in partnership with industry—

1 (1) advanced biochemical and thermochemical
2 conversion technologies capable of making biofuels
3 that are price-competitive with gasoline or diesel in
4 either internal combustion engines or fuel cell-pow-
5 ered vehicles, and bio-based products from a variety
6 of feedstocks, including grains, cellulosic biomass,
7 and other agricultural byproducts; and

8 (2) advanced biotechnology processes capable of
9 making biofuels and bio-based products with empha-
10 sis on development of biorefinery technologies using
11 enzyme-based processing systems.

12 **SEC. 920. CONCENTRATING SOLAR POWER RESEARCH AND**
13 **DEVELOPMENT PROGRAM.**

14 (a) IN GENERAL.—The Secretary shall conduct a
15 program of research and development to evaluate the po-
16 tential of concentrating solar power for hydrogen produc-
17 tion, including cogeneration approaches for both hydrogen
18 and electricity. Such program shall take advantage of ex-
19 isting facilities to the extent possible and shall include—

20 (1) development of optimized technologies that
21 are common to both electricity and hydrogen produc-
22 tion;

23 (2) evaluation of thermochemical cycles for hy-
24 drogen production at the temperatures attainable
25 with concentrating solar power;

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

3 (4) system architectures and economics studies;
4 and

5 (5) coordination with activities in the Advanced
6 Reactor Hydrogen Cogeneration Project on high
7 temperature materials, thermochemical cycles, and
8 economic issues.

9 (b) ASSESSMENT.—In carrying out the program
10 under this section, the Secretary shall—

11 (1) assess conflicting guidance on the economic
12 potential of concentrating solar power for electricity
13 production received from the National Research
14 Council report entitled “Renewable Power Pathways:
15 A Review of the U.S. Department of Energy’s Re-
16 newable Energy Programs” in 2000 and subsequent
17 Department-funded reviews of that report; and

18 (2) provide an assessment of the potential im-
19 pact of the technology before, or concurrent with,
20 submission of the fiscal year 2006 budget.

21 (c) REPORT.—Not later than 5 years after the date
22 of enactment of this Act, the Secretary shall provide a re-
23 port to Congress on the economic and technical potential
24 for electricity or hydrogen production, with or without co-
25 generation, with concentrating solar power, including the

1 economic and technical feasibility of potential construction
2 of a pilot demonstration facility suitable for commercial
3 production of electricity or hydrogen from concentrating
4 solar power.

5 **SEC. 921. MISCELLANEOUS PROJECTS.**

6 The Secretary may conduct research, development,
7 demonstration, and commercial application programs
8 for—

- 9 (1) ocean energy, including wave energy; and
10 (2) the combined use of renewable energy tech-
11 nologies with one another and with other energy
12 technologies, including the combined use of wind
13 power and coal gasification technologies.

14 **SEC. 922. RENEWABLE ENERGY IN PUBLIC BUILDINGS.**

15 (a) **DEMONSTRATION AND TECHNOLOGY TRANSFER**
16 **PROGRAM.**—The Secretary shall establish a program for
17 the demonstration of innovative technologies for solar and
18 other renewable energy sources in buildings owned or op-
19 erated by a State or local government, and for the dissemi-
20 nation of information resulting from such demonstration
21 to interested parties.

22 (b) **LIMIT ON FEDERAL FUNDING.**—The Secretary
23 shall provide under this section no more than 40 percent
24 of the incremental costs of the solar or other renewable
25 energy source project funded.

1 (c) REQUIREMENT.—As part of the application for
2 awards under this section, the Secretary shall require all
3 applicants—

4 (1) to demonstrate a continuing commitment to
5 the use of solar and other renewable energy sources
6 in buildings they own or operate; and

7 (2) to state how they expect any award to fur-
8 ther their transition to the significant use of renew-
9 able energy.

10 **SEC. 923. STUDY OF MARINE RENEWABLE ENERGY OP-**
11 **TIONS.**

12 (a) IN GENERAL.—The Secretary shall enter into an
13 arrangement with the National Academy of Sciences to
14 conduct a study on—

15 (1) the feasibility of various methods of renew-
16 able generation of energy from the ocean, including
17 energy from waves, tides, currents, and thermal gra-
18 dients; and

19 (2) the research, development, demonstration,
20 and commercial application activities required to
21 make marine renewable energy generation competi-
22 tive with other forms of electricity generation.

23 (b) TRANSMITTAL.—Not later than 1 year after the
24 date of enactment of this Act, the Secretary shall transmit

1 the study to Congress along with the Secretary's rec-
2 ommendations for implementing the results of the study.

3 **Subtitle D—Nuclear Energy**

4 **SEC. 924. NUCLEAR ENERGY.**

5 (a) CORE PROGRAMS.—The following sums are au-
6 thorized to be appropriated to the Secretary for nuclear
7 energy research, development, demonstration, and com-
8 mercial application activities, including activities author-
9 ized under this subtitle, other than those described in sub-
10 section (b):

11 (1) For fiscal year 2004, \$273,000,000.

12 (2) For fiscal year 2005, \$355,000,000.

13 (3) For fiscal year 2006, \$430,000,000.

14 (4) For fiscal year 2007, \$455,000,000.

15 (5) For fiscal year 2008, \$545,000,000.

16 (b) NUCLEAR INFRASTRUCTURE SUPPORT.—The fol-
17 lowing sums are authorized to be appropriated to the Sec-
18 retary for activities under section 925(e):

19 (1) For fiscal year 2004, \$125,000,000.

20 (2) For fiscal year 2005, \$130,000,000.

21 (3) For fiscal year 2006, \$135,000,000.

22 (4) For fiscal year 2007, \$140,000,000.

23 (5) For fiscal year 2008, \$145,000,000.

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

1 (b) NUCLEAR ENERGY PLANT OPTIMIZATION PRO-
2 GRAM.—The Secretary shall carry out a Nuclear Energy
3 Plant Optimization Program to support research and de-
4 velopment activities addressing reliability, availability, pro-
5 ductivity, component aging, safety, and security of existing
6 nuclear power plants.

7 (c) NUCLEAR POWER 2010 PROGRAM.—The Sec-
8 retary shall carry out a Nuclear Power 2010 Program,
9 consistent with recommendations in the October 2001 re-
10 port entitled “A Roadmap to Deploy New Nuclear Power
11 Plants in the United States by 2010” issued by the Nu-
12 clear Energy Research Advisory Committee of the Depart-
13 ment. Whatever type of reactor is chosen for the hydrogen
14 cogeneration project under subtitle C of title VI, that type
15 shall not be addressed in the Program under this section.
16 The Program shall include—

17 (1) support for first-of-a-kind engineering de-
18 sign and certification expenses of advanced nuclear
19 power plant designs, which offer improved safety
20 and economics over current conventional plants and
21 the promise of near-term to medium-term commer-
22 cial deployment;

23 (2) action by the Secretary to encourage domes-
24 tic power companies to install new nuclear plant ca-
25 pacity as soon as possible;

1 (3) utilization of the expertise and capabilities
2 of industry, universities, and National Laboratories
3 in evaluation of advanced nuclear fuel cycles and
4 fuels testing;

5 (4) consideration of proliferation-resistant pas-
6 sively-safe, small reactors suitable for long-term elec-
7 tricity production without refueling and suitable for
8 use in remote installations;

9 (5) participation of international collaborators
10 in research, development, design, and deployment ef-
11 forts as appropriate and consistent with United
12 States interests in nonproliferation of nuclear weap-
13 ons;

14 (6) encouragement for university and industry
15 participation; and

16 (7) selection of projects such as to strengthen
17 the competitive position of the domestic nuclear
18 power industrial infrastructure.

19 (d) GENERATION IV NUCLEAR ENERGY SYSTEMS
20 INITIATIVE.—The Secretary shall carry out a Generation
21 IV Nuclear Energy Systems Initiative to develop an over-
22 all technology plan and to support research and develop-
23 ment necessary to make an informed technical decision
24 about the most promising candidates for eventual commer-
25 cial application. The Initiative shall examine advanced

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

3 (1) are economically competitive with other elec-
4 tric power generation plants;

5 (2) have higher efficiency, lower cost, and im-
6 proved safety compared to reactors in operation on
7 the date of enactment of this Act;

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

11 (4) use improved instrumentation.

12 (e) NUCLEAR INFRASTRUCTURE SUPPORT.—The
13 Secretary shall develop and implement a strategy for the
14 facilities of the Office of Nuclear Energy, Science, and
15 Technology and shall transmit a report containing the
16 strategy along with the President's budget request to Con-
17 gress for fiscal year 2006.

18 **SEC. 926. ADVANCED FUEL CYCLE INITIATIVE.**

19 (a) IN GENERAL.—The Secretary, through the Direc-
20 tor of the Office of Nuclear Energy, Science, and Tech-
21 nology, shall conduct an advanced fuel recycling tech-
22 nology research and development program to evaluate pro-
23 liferation-resistant fuel recycling and transmutation tech-
24 nologies that minimize environmental or public health and
25 safety impacts as an alternative to aqueous reprocessing

1 technologies deployed as of the date of enactment of this
2 Act in support of evaluation of alternative national strate-
3 gies for spent nuclear fuel and the Generation IV ad-
4 vanced reactor concepts, subject to annual review by the
5 Secretary's Nuclear Energy Research Advisory Committee
6 or other independent entity, as appropriate. Opportunities
7 to enhance progress of the program through international
8 cooperation should be sought.

9 (b) REPORTS.—The Secretary shall report on the ac-
10 tivities of the advanced fuel recycling technology research
11 and development program as part of the Department's an-
12 nual budget submission.

13 **SEC. 927. UNIVERSITY NUCLEAR SCIENCE AND ENGINEER-**
14 **ING SUPPORT.**

15 (a) ESTABLISHMENT.—The Secretary shall support
16 a program to invest in human resources and infrastructure
17 in the nuclear sciences and engineering and related fields
18 (including health physics and nuclear and radiochemistry),
19 consistent with departmental missions related to civilian
20 nuclear research and development.

21 (b) DUTIES.—In carrying out the program under this
22 section, the Secretary shall establish fellowship and faculty
23 assistance programs, as well as provide support for funda-
24 mental research and encourage collaborative research
25 among industry, National Laboratories, and universities

1 through the Nuclear Energy Research Initiative. The Sec-
2 retary is encouraged to support activities addressing the
3 entire fuel cycle through involvement of both the Office
4 of Nuclear Energy, Science, and Technology and the Of-
5 fice of Civilian Radioactive Waste Management. The Sec-
6 retary shall support communication and outreach related
7 to nuclear science, engineering, and nuclear waste man-
8 agement, consistent with interests of the United States in
9 nonproliferation of nuclear weapons capabilities.

10 (c) STRENGTHENING UNIVERSITY RESEARCH AND
11 TRAINING REACTORS AND ASSOCIATED INFRASTRUC-
12 TURE.—Activities under this section may include—

13 (1) converting research and training reactors
14 currently using high-enrichment fuels to low-enrich-
15 ment fuels, upgrading operational instrumentation,
16 and sharing of reactors among institutions of higher
17 education;

18 (2) providing technical assistance, in collabora-
19 tion with the United States nuclear industry, in reli-
20 censing and upgrading research and training reac-
21 tors as part of a student training program; and

22 (3) providing funding, through the Innovations
23 in Nuclear Infrastructure and Education Program,
24 for reactor improvements as part of a focused effort
25 that emphasizes research, training, and education.

1 (d) UNIVERSITY NATIONAL LABORATORY INTER-
2 ACTIONS.—The Secretary shall develop sabbatical fellow-
3 ship and visiting scientist programs to encourage sharing
4 of personnel between National Laboratories and univer-
5 sities.

6 (e) OPERATING AND MAINTENANCE COSTS.—Fund-
7 ing for a research project provided under this section may
8 be used to offset a portion of the operating and mainte-
9 nance costs of a research and training reactor at an insti-
10 tution of higher education used in the research project.

11 **SEC. 928. SECURITY OF REACTOR DESIGNS.**

12 The Secretary, through the Director of the Office of
13 Nuclear Energy, Science, and Technology, shall conduct
14 a research and development program on cost-effective
15 technologies for increasing the safety of reactor designs
16 from natural phenomena and the security of reactor de-
17 signs from deliberate attacks.

18 **SEC. 929. ALTERNATIVES TO INDUSTRIAL RADIOACTIVE**
19 **SOURCES.**

20 (a) STUDY.—The Secretary shall conduct a study and
21 provide a report to Congress not later than August 1,
22 2004. The study shall—

23 (1) survey industrial applications of large radio-
24 active sources, including well-logging sources;

1 (2) review current domestic and international
2 Department, Department of Defense, Department of
3 State, and commercial programs to manage and dis-
4 pose of radioactive sources;

5 (3) discuss disposal options and practices for
6 currently deployed or future sources and, if defi-
7 ciencies are noted in existing disposal options or
8 practices for either deployed or future sources, rec-
9 ommend options to remedy deficiencies; and

10 (4) develop a program plan for research and de-
11 velopment to develop alternatives to large industrial
12 sources that reduce safety, environmental, or pro-
13 liferation risks to either workers using the sources or
14 the public.

15 (b) PROGRAM.—The Secretary shall establish a re-
16 search and development program to implement the pro-
17 gram plan developed under subsection (a)(4). The pro-
18 gram shall include miniaturized particle accelerators for
19 well-logging or other industrial applications and portable
20 accelerators for production of short-lived radioactive mate-
21 rials at an industrial site.

22 **SEC. 930. GEOLOGICAL ISOLATION OF SPENT FUEL.**

23 The Secretary shall conduct a study to determine the
24 feasibility of deep borehole disposal of spent nuclear fuel
25 and high-level radioactive waste. The study shall empha-

1 size geological, chemical, and hydrological characterization
2 of, and design of engineered structures for, deep borehole
3 environments. Not later than 1 year after the date of en-
4 actment of this Act, the Secretary shall transmit the study
5 to Congress.

6 **Subtitle E—Fossil Energy**

7 **PART I—RESEARCH PROGRAMS**

8 **SEC. 931. FOSSIL ENERGY.**

9 (a) IN GENERAL.—The following sums are author-
10 ized to be appropriated to the Secretary for fossil energy
11 research, development, demonstration, and commercial ap-
12 plication activities, including activities authorized under
13 this part:

14 (1) For fiscal year 2004, \$530,000,000.

15 (2) For fiscal year 2005, \$556,000,000.

16 (3) For fiscal year 2006, \$583,000,000.

17 (4) For fiscal year 2007, \$611,000,000.

18 (5) For fiscal year 2008, \$626,000,000.

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

21 (1) For activities under section 932(b)(2),
22 \$28,000,000 for each of the fiscal years 2004
23 through 2008.

24 (2) For activities under section 934—

25 (A) for fiscal year 2004, \$12,000,000;

1 (B) for fiscal year 2005, \$15,000,000; and
2 (C) for each of fiscal years 2006 through
3 2008, \$20,000,000.

4 (3) For activities under section 935—

5 (A) for fiscal year 2004, \$259,000,000;
6 (B) for fiscal year 2005, \$272,000,000;
7 (C) for fiscal year 2006, \$285,000,000;
8 (D) for fiscal year 2007, \$298,000,000;

9 and

10 (E) for fiscal year 2008, \$308,000,000.

11 (4) For the Office of Arctic Energy under sec-
12 tion 3197 of the Floyd D. Spence National Defense
13 Authorization Act for Fiscal Year 2001 (42 U.S.C.
14 7144d), \$25,000,000 for each of fiscal years 2004
15 through 2008.

16 (5) For activities under section 933,
17 \$4,000,000 for fiscal year 2004 and \$2,000,000 for
18 each of fiscal years 2005 through 2008.

19 (c) EXTENDED AUTHORIZATION.—There are author-
20 ized to be appropriated to the Secretary for the Office of
21 Arctic Energy under section 3197 of the Floyd D. Spence
22 National Defense Authorization Act for Fiscal Year 2001
23 (42 U.S.C. 7144d), \$25,000,000 for each of fiscal years
24 2009 through 2012.

25 (d) LIMITS ON USE OF FUNDS.—

1 (1) NO FUNDS FOR CERTAIN PROGRAMS.—None
2 of the funds authorized under this section may be
3 used for Fossil Energy Environmental Restoration
4 or Import/Export Authorization.

5 (2) INSTITUTIONS OF HIGHER EDUCATION.—Of
6 the funds authorized under subsection (b)(2), not
7 less than 20 percent of the funds appropriated for
8 each fiscal year shall be dedicated to research and
9 development carried out at institutions of higher
10 education.

11 **SEC. 932. OIL AND GAS RESEARCH PROGRAMS.**

12 (a) OIL AND GAS RESEARCH.—The Secretary shall
13 conduct a program of research, development, demonstra-
14 tion, and commercial application on oil and gas,
15 including—

- 16 (1) exploration and production;
- 17 (2) gas hydrates;
- 18 (3) reservoir life and extension;
- 19 (4) transportation and distribution infrastruc-
20 ture;
- 21 (5) ultraclean fuels;
- 22 (6) heavy oil and oil shale;
- 23 (7) related environmental research; and
- 24 (8) compressed natural gas marine transport.

25 (b) FUEL CELLS.—

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

5 (2) IMPROVED MANUFACTURING PRODUCTION
6 AND PROCESSES.—The demonstrations under para-
7 graph (1) shall include fuel cell technology for com-
8 mercial, residential, and transportation applications,
9 and distributed generation systems, utilizing im-
10 proved manufacturing production and processes.

11 (c) NATURAL GAS AND OIL DEPOSITS REPORT.—
12 Not later than 2 years after the date of enactment of this
13 Act, and every 2 years thereafter, the Secretary of the In-
14 terior, in consultation with other appropriate Federal
15 agencies, shall transmit a report to Congress of the latest
16 estimates of natural gas and oil reserves, reserves growth,
17 and undiscovered resources in Federal and State waters
18 off the coast of Louisiana and Texas.

19 (d) INTEGRATED CLEAN POWER AND ENERGY RE-
20 SEARCH.—

21 (1) NATIONAL CENTER OR CONSORTIUM OF EX-
22 CELLENCE.—The Secretary shall establish a na-
23 tional center or consortium of excellence in clean en-
24 ergy and power generation, utilizing the resources of
25 the existing Clean Power and Energy Research Con-

1 consortium, to address the Nation's critical dependence
2 on energy and the need to reduce emissions.

3 (2) PROGRAM.—The center or consortium shall
4 conduct a program of research, development, dem-
5 onstration, and commercial application on inte-
6 grating the following focus areas:

7 (A) Efficiency and reliability of gas tur-
8 bines for power generation.

9 (B) Reduction in emissions from power
10 generation.

11 (C) Promotion of energy conservation
12 issues.

13 (D) Effectively utilizing alternative fuels
14 and renewable energy.

15 (E) Development of advanced materials
16 technology for oil and gas exploration and utili-
17 zation in harsh environments.

18 (F) Education on energy and power gen-
19 eration issues.

20 **SEC. 933. TECHNOLOGY TRANSFER.**

21 The Secretary shall establish a competitive program
22 to award a contract to a nonprofit entity for the purpose
23 of transferring technologies developed with public funds.
24 The entity selected under this section shall have experi-
25 ence in offshore oil and gas technology research manage-

1 ment, in the transfer of technologies developed with public
2 funds to the offshore and maritime industry, and in man-
3 agement of an offshore and maritime industry consortium.
4 The program consortium selected under section 942 shall
5 not be eligible for selection under this section. When ap-
6 propriate, the Secretary shall consider utilizing the entity
7 selected under this section when implementing the activi-
8 ties authorized by section 975.

9 **SEC. 934. RESEARCH AND DEVELOPMENT FOR COAL MIN-**
10 **ING TECHNOLOGIES.**

11 (a) ESTABLISHMENT.—The Secretary shall carry out
12 a program of research and development on coal mining
13 technologies. The Secretary shall cooperate with appro-
14 priate Federal agencies, coal producers, trade associations,
15 equipment manufacturers, institutions of higher education
16 with mining engineering departments, and other relevant
17 entities.

18 (b) PROGRAM.—The research and development activi-
19 ties carried out under this section shall—

20 (1) be guided by the mining research and devel-
21 opment priorities identified by the Mining Industry
22 of the Future Program and in the recommendations
23 from relevant reports of the National Academy of
24 Sciences on mining technologies;

1 (2) include activities exploring minimization of
2 contaminants in mined coal that contribute to envi-
3 ronmental concerns including development and dem-
4 onstration of electromagnetic wave imaging ahead of
5 mining operations;

6 (3) develop and demonstrate electromagnetic
7 wave imaging and radar techniques for horizontal
8 drilling in coal beds in order to increase methane re-
9 covery efficiency, prevent spoilage of domestic coal
10 reserves, and minimize water disposal associated
11 with methane extraction; and

12 (4) expand mining research capabilities at insti-
13 tutions of higher education.

14 **SEC. 935. COAL AND RELATED TECHNOLOGIES PROGRAM.**

15 (a) IN GENERAL.—In addition to the programs au-
16 thorized under title IV, the Secretary shall conduct a pro-
17 gram of technology research, development, demonstration,
18 and commercial application for coal and power systems,
19 including programs to facilitate production and generation
20 of coal-based power through—

21 (1) innovations for existing plants;

22 (2) integrated gasification combined cycle;

23 (3) advanced combustion systems;

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

1 (5) carbon capture and sequestration research
2 and development;

3 (6) coal-derived transportation fuels and chemi-
4 cals;

5 (7) solid fuels and feedstocks;

6 (8) advanced coal-related research;

7 (9) advanced separation technologies; and

8 (10) a joint project for permeability enhance-
9 ment in coals for natural gas production and carbon
10 dioxide sequestration.

11 (b) COST AND PERFORMANCE GOALS.—In carrying
12 out programs authorized by this section, the Secretary
13 shall identify cost and performance goals for coal-based
14 technologies that would permit the continued cost-com-
15 petitive use of coal for electricity generation, as chemical
16 feedstocks, and as transportation fuel in 2007, 2015, and
17 the years after 2020. In establishing such cost and per-
18 formance goals, the Secretary shall—

19 (1) consider activities and studies undertaken
20 to date by industry in cooperation with the Depart-
21 ment in support of such assessment;

22 (2) consult with interested entities, including
23 coal producers, industries using coal, organizations
24 to promote coal and advanced coal technologies, en-

1 vironmental organizations, and organizations rep-
2 resenting workers;

3 (3) not later than 120 days after the date of
4 enactment of this Act, publish in the Federal Reg-
5 ister proposed draft cost and performance goals for
6 public comments; and

7 (4) not later than 180 days after the date of
8 enactment of this Act and every 4 years thereafter,
9 submit to Congress a report describing final cost
10 and performance goals for such technologies that in-
11 cludes a list of technical milestones as well as an ex-
12 planation of how programs authorized in this section
13 will not duplicate the activities authorized under the
14 Clean Coal Power Initiative authorized under sub-
15 title A of title IV.

16 **SEC. 936. COMPLEX WELL TECHNOLOGY TESTING FACIL-**
17 **ITY.**

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

1 **SEC. 937. FISCHER-TROPSCH DIESEL FUEL LOAN GUAR-**
2 **ANTEE PROGRAM.**

3 (a) DEFINITION OF FISCHER-TROPSCH DIESEL
4 FUEL.—In this section, the term “Fischer-Tropsch diesel
5 fuel” means diesel fuel that—

6 (1) contains less than 10 parts per million sul-
7 fur; and

8 (2) is produced through the Fischer-Tropsch
9 liquification process from coal or waste from coal
10 that was mined in the United States.

11 (b) LOAN GUARANTEES.—

12 (1) ESTABLISHMENT OF PROGRAM.—The Sec-
13 retary of Energy shall establish a program to pro-
14 vide guarantees of loans by private lending institu-
15 tions for the construction of facilities for the produc-
16 tion of Fischer-Tropsch diesel fuel and commercial
17 byproducts of that production.

18 (2) REQUIREMENTS.—The Secretary may pro-
19 vide a loan guarantee under paragraph (1) if—

20 (A) without a loan guarantee, credit is not
21 available to the applicant under reasonable
22 terms or conditions sufficient to finance the
23 construction of a facility described in paragraph
24 (1);

25 (B) the prospective earning power of the
26 applicant and the character and value of the se-

1 curity pledged provide a reasonable assurance
2 of repayment of the loan to be guaranteed in
3 accordance with the terms of the loan; and

4 (C) the loan bears interest at a rate deter-
5 mined by the Secretary to be reasonable, taking
6 into account the current average yield on out-
7 standing obligations of the United States with
8 remaining periods of maturity comparable to
9 the maturity of the loan.

10 (3) CRITERIA.—In selecting recipients of loan
11 guarantees from among applicants, the Secretary
12 shall give preference to proposals that—

13 (A) meet all Federal and State permitting
14 requirements;

15 (B) are most likely to be successful; and

16 (C) are located in local markets that have
17 the greatest need for the facility because of—

18 (i) the availability of domestic coal or
19 coal waste for conversion; or

20 (ii) a projected high level of demand
21 for Fischer-Tropsch diesel fuel or other
22 commercial byproducts of the facility.

23 (4) MATURITY.—A loan guaranteed under
24 paragraph (1) shall have a maturity of not more
25 than 25 years.

1 (5) TERMS AND CONDITIONS.—The loan agree-
2 ment for a loan guaranteed under paragraph (1)
3 shall provide that no provision of the loan may be
4 amended or waived without the consent of the Sec-
5 retary.

6 (6) GUARANTEE FEE.—A recipient of a loan
7 guarantee under paragraph (1) shall pay the Sec-
8 retary an amount to be determined by the Secretary
9 to be sufficient to cover the administrative costs of
10 the Secretary relating to the loan guarantee.

11 (7) FULL FAITH AND CREDIT.—

12 (A) IN GENERAL.—The full faith and cred-
13 it of the United States is pledged to payment
14 of loan guarantees made under this section.

15 (B) CONCLUSIVE EVIDENCE.—Any loan
16 guarantee made by the Secretary under this
17 section shall be conclusive evidence of the eligi-
18 bility of the loan for the guarantee with respect
19 to principal and interest.

20 (C) VALIDITY.—The validity of a loan
21 guarantee shall be incontestable in the hands of
22 a holder of the guaranteed loan.

23 (8) REPORTS.—Until each guaranteed loan
24 under this section is repaid in full, the Secretary

1 shall annually submit to Congress a report on the
2 activities of the Secretary under this section.

3 (9) AUTHORIZATION OF APPROPRIATIONS.—

4 There are authorized to be appropriated such sums
5 as are necessary to carry out this section.

6 (10) TERMINATION OF AUTHORITY.—The au-
7 thority of the Secretary to issue a new loan guar-
8 antee under paragraph (1) terminates on the date
9 that is 5 years after the date of enactment of this
10 Act.

11 **PART II—ULTRA-DEEPWATER AND UNCONVEN-**
12 **TIONAL NATURAL GAS AND OTHER PETRO-**
13 **LEUM RESOURCES**

14 **SEC. 941. PROGRAM AUTHORITY.**

15 (a) IN GENERAL.—The Secretary shall carry out a
16 program under this part of research, development, dem-
17 onstration, and commercial application of technologies for
18 ultra-deepwater and unconventional natural gas and other
19 petroleum resource exploration and production, including
20 addressing the technology challenges for small producers,
21 safe operations, and environmental mitigation (including
22 reduction of greenhouse gas emissions and sequestration
23 of carbon).

24 (b) PROGRAM ELEMENTS.—The program under this
25 part shall address the following areas, including improving

1 safety and minimizing environmental impacts of activities
2 within each area:

3 (1) Ultra-deepwater technology, including drill-
4 ing to formations in the Outer Continental Shelf to
5 depths greater than 15,000 feet.

6 (2) Ultra-deepwater architecture.

7 (3) Unconventional natural gas and other petro-
8 leum resource exploration and production tech-
9 nology, including the technology challenges of small
10 producers.

11 (c) LIMITATION ON LOCATION OF FIELD ACTIVI-
12 TIES.—Field activities under the program under this part
13 shall be carried out only—

14 (1) in—

15 (A) areas in the territorial waters of the
16 United States not under any Outer Continental
17 Shelf moratorium as of September 30, 2002;

18 (B) areas onshore in the United States on
19 public land administered by the Secretary of the
20 Interior available for oil and gas leasing, where
21 consistent with applicable law and land use
22 plans; and

23 (C) areas onshore in the United States on
24 State or private land, subject to applicable law;
25 and

1 (2) with the approval of the appropriate Fed-
2 eral or State land management agency or private
3 land owner.

4 (d) RESEARCH AT NATIONAL ENERGY TECHNOLOGY
5 LABORATORY.—The Secretary, through the National En-
6 ergy Technology Laboratory, shall carry out research com-
7 plementary to research under subsection (b).

8 (e) CONSULTATION WITH SECRETARY OF THE INTE-
9 RIOR.—In carrying out this part, the Secretary shall con-
10 sult regularly with the Secretary of the Interior.

11 **SEC. 942. ULTRA-DEEPWATER PROGRAM.**

12 (a) IN GENERAL.—The Secretary shall carry out the
13 activities under section 941(a), to maximize the use of the
14 ultra-deepwater natural gas and other petroleum resources
15 of the United States by increasing the supply of such re-
16 sources, through reducing the cost and increasing the effi-
17 ciency of exploration for and production of such resources,
18 while improving safety and minimizing environmental im-
19 pacts.

20 (b) ROLE OF THE SECRETARY.—The Secretary shall
21 have ultimate responsibility for, and oversight of, all as-
22 pects of the program under this section.

23 (c) ROLE OF THE PROGRAM CONSORTIUM.—

24 (1) IN GENERAL.—The Secretary may contract
25 with a consortium to—

1 (A) manage awards pursuant to subsection
2 (f)(4);

3 (B) make recommendations to the Sec-
4 retary for project solicitations;

5 (C) disburse funds awarded under sub-
6 section (f) as directed by the Secretary in ac-
7 cordance with the annual plan under subsection
8 (e); and

9 (D) carry out other activities assigned to
10 the program consortium by this section.

11 (2) LIMITATION.—The Secretary may not as-
12 sign any activities to the program consortium except
13 as specifically authorized under this section.

14 (3) CONFLICT OF INTEREST.—

15 (A) PROCEDURES.—The Secretary shall
16 establish procedures—

17 (i) to ensure that each board member,
18 officer, or employee of the program consor-
19 tium who is in a decision-making capacity
20 under subsection (f)(3) or (4) shall disclose
21 to the Secretary any financial interests in,
22 or financial relationships with, applicants
23 for or recipients of awards under this sec-
24 tion, including those of his or her spouse
25 or minor child, unless such relationships or

1 interests would be considered to be remote
2 or inconsequential; and

3 (ii) to require any board member, offi-
4 cer, or employee with a financial relation-
5 ship or interest disclosed under clause (i)
6 to recuse himself or herself from any re-
7 view under subsection (f)(3) or oversight
8 under subsection (f)(4) with respect to
9 such applicant or recipient.

10 (B) FAILURE TO COMPLY.—The Secretary
11 may disqualify an application or revoke an
12 award under this section if a board member, of-
13 ficer, or employee has failed to comply with pro-
14 cedures required under subparagraph (A)(ii).

15 (d) SELECTION OF THE PROGRAM CONSORTIUM.—

16 (1) IN GENERAL.—The Secretary shall select
17 the program consortium through an open, competi-
18 tive process.

19 (2) MEMBERS.—The program consortium may
20 include corporations, trade associations, institutions
21 of higher education, National Laboratories, or other
22 research institutions. After submitting a proposal
23 under paragraph (4), the program consortium may
24 not add members without the consent of the Sec-
25 retary.

1 (3) TAX STATUS.—The program consortium
2 shall be an entity that is exempt from tax under sec-
3 tion 501(c)(3) of the Internal Revenue Code of
4 1986.

5 (4) SCHEDULE.—Not later than 180 days after
6 the date of enactment of this Act, the Secretary
7 shall solicit proposals from eligible consortia to per-
8 form the duties in subsection (c)(1), which shall be
9 submitted not later than 360 days after the date of
10 enactment of this Act. The Secretary shall select the
11 program consortium not later than 18 months after
12 such date of enactment.

13 (5) APPLICATION.—Applicants shall submit a
14 proposal including such information as the Secretary
15 may require. At a minimum, each proposal shall—

16 (A) list all members of the consortium;

17 (B) fully describe the structure of the con-
18 sortium, including any provisions relating to in-
19 tellectual property; and

20 (C) describe how the applicant would carry
21 out the activities of the program consortium
22 under this section.

23 (6) ELIGIBILITY.—To be eligible to be selected
24 as the program consortium, an applicant must be an
25 entity whose members collectively have demonstrated

1 capabilities in planning and managing research, de-
2 velopment, demonstration, and commercial applica-
3 tion programs in natural gas or other petroleum ex-
4 ploration or production.

5 (7) CRITERION.—The Secretary shall consider
6 the amount of the fee an applicant proposes to re-
7 ceive under subsection (g) in selecting a consortium
8 under this section.

9 (e) ANNUAL PLAN.—

10 (1) IN GENERAL.—The program under this sec-
11 tion shall be carried out pursuant to an annual plan
12 prepared by the Secretary in accordance with para-
13 graph (2).

14 (2) DEVELOPMENT.—

15 (A) SOLICITATION OF RECOMMENDA-
16 TIONS.—Before drafting an annual plan under
17 this subsection, the Secretary shall solicit spe-
18 cific written recommendations from the pro-
19 gram consortium for each element to be ad-
20 dressed in the plan, including those described in
21 paragraph (4). The Secretary may request that
22 the program consortium submit its rec-
23 ommendations in the form of a draft annual
24 plan.

1 (B) SUBMISSION OF RECOMMENDATIONS;
2 OTHER COMMENT.—The Secretary shall submit
3 the recommendations of the program consor-
4 tium under subparagraph (A) to the Ultra-
5 Deepwater Advisory Committee established
6 under section 945(a) for review, and such Advi-
7 sory Committee shall provide to the Secretary
8 written comments by a date determined by the
9 Secretary. The Secretary may also solicit com-
10 ments from any other experts.

11 (C) CONSULTATION.—The Secretary shall
12 consult regularly with the program consortium
13 throughout the preparation of the annual plan.

14 (3) PUBLICATION.—The Secretary shall trans-
15 mit to Congress and publish in the Federal Register
16 the annual plan, along with any written comments
17 received under paragraph (2)(A) and (B).

18 (4) CONTENTS.—The annual plan shall describe
19 the ongoing and prospective activities of the pro-
20 gram under this section and shall include—

21 (A) a list of any solicitations for awards
22 that the Secretary plans to issue to carry out
23 research, development, demonstration, or com-
24 mercial application activities, including the top-
25 ics for such work, who would be eligible to

1 apply, selection criteria, and the duration of
2 awards; and

3 (B) a description of the activities expected
4 of the program consortium to carry out sub-
5 section (f)(4).

6 (5) ESTIMATES OF INCREASED ROYALTY RE-
7 CEIPTS.—The Secretary, in consultation with the
8 Secretary of the Interior, shall provide an annual re-
9 port to Congress with the President's budget on the
10 estimated cumulative increase in Federal royalty re-
11 ceipts (if any) resulting from the implementation of
12 this part. The initial report under this paragraph
13 shall be submitted in the first President's budget fol-
14 lowing the completion of the first annual plan re-
15 quired under this subsection.

16 (f) AWARDS.—

17 (1) IN GENERAL.—The Secretary shall make
18 awards to carry out research, development, dem-
19 onstration, and commercial application activities
20 under the program under this section. The program
21 consortium shall not be eligible to receive such
22 awards, but members of the program consortium
23 may receive such awards.

24 (2) PROPOSALS.—The Secretary shall solicit
25 proposals for awards under this subsection in such

1 manner and at such time as the Secretary may pre-
2 scribe, in consultation with the program consortium.

3 (3) REVIEW.—The Secretary shall make awards
4 under this subsection through a competitive process,
5 which shall include a review by individuals selected
6 by the Secretary. Such individuals shall include, for
7 each application, Federal officials, the program con-
8 sortium, and non-Federal experts who are not board
9 members, officers, or employees of the program con-
10 sortium or of a member of the program consortium.

11 (4) OVERSIGHT.—

12 (A) IN GENERAL.—The program consor-
13 tium shall oversee the implementation of
14 awards under this subsection, consistent with
15 the annual plan under subsection (e), including
16 disbursing funds and monitoring activities car-
17 ried out under such awards for compliance with
18 the terms and conditions of the awards.

19 (B) EFFECT.—Nothing in subparagraph
20 (A) shall limit the authority or responsibility of
21 the Secretary to oversee awards, or limit the
22 authority of the Secretary to review or revoke
23 awards.

24 (C) PROVISION OF INFORMATION.—The
25 Secretary shall provide to the program consor-

1 tium the information necessary for the program
2 consortium to carry out its responsibilities
3 under this paragraph.

4 (g) ADMINISTRATIVE COSTS.—

5 (1) IN GENERAL.—To compensate the program
6 consortium for carrying out its activities under this
7 section, the Secretary shall provide to the program
8 consortium funds sufficient to administer the pro-
9 gram. This compensation may include a manage-
10 ment fee consistent with Department of Energy con-
11 tracting practices and procedures.

12 (2) ADVANCE.—The Secretary shall advance
13 funds to the program consortium upon selection of
14 the consortium, which shall be deducted from
15 amounts to be provided under paragraph (1).

16 (h) AUDIT.—The Secretary shall retain an inde-
17 pendent, commercial auditor to determine the extent to
18 which funds provided to the program consortium, and
19 funds provided under awards made under subsection (f),
20 have been expended in a manner consistent with the pur-
21 poses and requirements of this part. The auditor shall
22 transmit a report annually to the Secretary, who shall
23 transmit the report to Congress, along with a plan to rem-
24 edy any deficiencies cited in the report.

1 **SEC. 943. UNCONVENTIONAL NATURAL GAS AND OTHER PE-**
2 **TROLEUM RESOURCES PROGRAM.**

3 (a) IN GENERAL.—The Secretary shall carry out ac-
4 tivities under subsection 941(b)(3), to maximize the use
5 of the onshore unconventional natural gas and other petro-
6 leum resources of the United States, by increasing the
7 supply of such resources, through reducing the cost and
8 increasing the efficiency of exploration for and production
9 of such resources, while improving safety and minimizing
10 environmental impacts.

11 (b) AWARDS.—

12 (1) IN GENERAL.—The Secretary shall carry
13 out this section through awards to research con-
14 sortia made through an open, competitive process.
15 As a condition of award of funds, qualified research
16 consortia shall—

17 (A) demonstrate capability and experience
18 in unconventional onshore natural gas or other
19 petroleum research and development;

20 (B) provide a research plan that dem-
21 onstrates how additional natural gas or oil pro-
22 duction will be achieved; and

23 (C) at the request of the Secretary, provide
24 technical advice to the Secretary for the pur-
25 poses of developing the annual plan required
26 under subsection (e).

1 (2) PRODUCTION POTENTIAL.—The Secretary
2 shall seek to ensure that the number and types of
3 awards made under this subsection have reasonable
4 potential to lead to additional oil and natural gas
5 production on Federal lands.

6 (3) SCHEDULE.—To carry out this subsection,
7 not later than 180 days after the date of enactment
8 of this Act, the Secretary shall solicit proposals from
9 research consortia, which shall be submitted not
10 later than 360 days after the date of enactment of
11 this Act. The Secretary shall select the first group
12 of research consortia to receive awards under this
13 subsection not later than 18 months after such date
14 of enactment.

15 (c) AUDIT.—The Secretary shall retain an inde-
16 pendent, commercial auditor to determine the extent to
17 which funds provided under awards made under this sec-
18 tion have been expended in a manner consistent with the
19 purposes and requirements of this part. The auditor shall
20 transmit a report annually to the Secretary, who shall
21 transmit the report to Congress, along with a plan to rem-
22 edy any deficiencies cited in the report.

23 (d) FOCUS AREAS FOR AWARDS.—

24 (1) UNCONVENTIONAL RESOURCES.—Awards
25 from allocations under section 949(d)(2) shall focus

1 on areas including advanced coalbed methane, deep
2 drilling, natural gas production from tight sands,
3 natural gas production from gas shales, stranded
4 gas, innovative exploration and production tech-
5 niques, enhanced recovery techniques, and environ-
6 mental mitigation of unconventional natural gas and
7 other petroleum resources exploration and produc-
8 tion.

9 (2) SMALL PRODUCERS.—Awards from alloca-
10 tions under section 949(d)(3) shall be made to con-
11 sortia consisting of small producers or organized pri-
12 marily for the benefit of small producers, and shall
13 focus on areas including complex geology involving
14 rapid changes in the type and quality of the oil and
15 gas reservoirs across the reservoir; low reservoir
16 pressure; unconventional natural gas reservoirs in
17 coalbeds, deep reservoirs, tight sands, or shales; and
18 unconventional oil reservoirs in tar sands and oil
19 shales.

20 (e) ANNUAL PLAN.—

21 (1) IN GENERAL.—The program under this sec-
22 tion shall be carried out pursuant to an annual plan
23 prepared by the Secretary in accordance with para-
24 graph (2).

25 (2) DEVELOPMENT.—

1 (A) WRITTEN RECOMMENDATIONS.—Be-
2 fore drafting an annual plan under this sub-
3 section, the Secretary shall solicit specific writ-
4 ten recommendations from the research con-
5 sortia receiving awards under subsection (b)
6 and the Unconventional Resources Technology
7 Advisory Committee for each element to be ad-
8 dressed in the plan, including those described in
9 subparagraph (D).

10 (B) CONSULTATION.—The Secretary shall
11 consult regularly with the research consortia
12 throughout the preparation of the annual plan.

13 (C) PUBLICATION.—The Secretary shall
14 transmit to Congress and publish in the Fed-
15 eral Register the annual plan, along with any
16 written comments received under subparagraph
17 (A).

18 (D) CONTENTS.—The annual plan shall
19 describe the ongoing and prospective activities
20 under this section and shall include a list of any
21 solicitations for awards that the Secretary plans
22 to issue to carry out research, development,
23 demonstration, or commercial application activi-
24 ties, including the topics for such work, who

1 would be eligible to apply, selection criteria, and
2 the duration of awards.

3 (3) ESTIMATES OF INCREASED ROYALTY RE-
4 CEIPTS.—The Secretary, in consultation with the
5 Secretary of the Interior, shall provide an annual re-
6 port to Congress with the President’s budget on the
7 estimated cumulative increase in Federal royalty re-
8 ceipts (if any) resulting from the implementation of
9 this part. The initial report under this paragraph
10 shall be submitted in the first President’s budget fol-
11 lowing the completion of the first annual plan re-
12 quired under this subsection.

13 (f) ACTIVITIES BY THE UNITED STATES GEOLOGI-
14 CAL SURVEY.—The Secretary of the Interior, through the
15 United States Geological Survey, shall, where appropriate,
16 carry out programs of long-term research to complement
17 the programs under this section.

18 **SEC. 944. ADDITIONAL REQUIREMENTS FOR AWARDS.**

19 (a) DEMONSTRATION PROJECTS.—An application for
20 an award under this part for a demonstration project shall
21 describe with specificity the intended commercial use of
22 the technology to be demonstrated.

23 (b) FLEXIBILITY IN LOCATING DEMONSTRATION
24 PROJECTS.—Subject to the limitation in section 941(c),
25 a demonstration project under this part relating to an

1 ultra-deepwater technology or an ultra-deepwater architec-
2 ture may be conducted in deepwater depths.

3 (c) INTELLECTUAL PROPERTY AGREEMENTS.—If an
4 award under this part is made to a consortium (other than
5 the program consortium), the consortium shall provide to
6 the Secretary a signed contract agreed to by all members
7 of the consortium describing the rights of each member
8 to intellectual property used or developed under the award.

9 (d) TECHNOLOGY TRANSFER.—2.5 percent of the
10 amount of each award made under this part shall be des-
11 ignated for technology transfer and outreach activities
12 under this title.

13 (e) COST SHARING REDUCTION FOR INDEPENDENT
14 PRODUCERS.—In applying the cost sharing requirements
15 under section 972 to an award under this part the Sec-
16 retary may reduce or eliminate the non-Federal require-
17 ment if the Secretary determines that the reduction is nec-
18 essary and appropriate considering the technological risks
19 involved in the project.

20 **SEC. 945. ADVISORY COMMITTEES.**

21 (a) ULTRA-DEEPWATER ADVISORY COMMITTEE.—

22 (1) ESTABLISHMENT.—Not later than 270 days
23 after the date of enactment of this Act, the Sec-
24 retary shall establish an advisory committee to be
25 known as the Ultra-Deepwater Advisory Committee.

1 (2) MEMBERSHIP.—The advisory committee
2 under this subsection shall be composed of members
3 appointed by the Secretary including—

4 (A) individuals with extensive research ex-
5 perience or operational knowledge of offshore
6 natural gas and other petroleum exploration
7 and production;

8 (B) individuals broadly representative of
9 the affected interests in ultra-deepwater natural
10 gas and other petroleum production, including
11 interests in environmental protection and safe
12 operations;

13 (C) no individuals who are Federal employ-
14 ees; and

15 (D) no individuals who are board members,
16 officers, or employees of the program Consor-
17 tium.

18 (3) DUTIES.—The advisory committee under
19 this subsection shall—

20 (A) advise the Secretary on the develop-
21 ment and implementation of programs under
22 this part related to ultra-deepwater natural gas
23 and other petroleum resources; and

24 (B) carry out section 942(e)(2)(B).

1 (4) COMPENSATION.—A member of the advi-
2 sory committee under this subsection shall serve
3 without compensation but shall receive travel ex-
4 penses in accordance with applicable provisions
5 under subchapter I of chapter 57 of title 5, United
6 States Code.

7 (b) UNCONVENTIONAL RESOURCES TECHNOLOGY
8 ADVISORY COMMITTEE.—

9 (1) ESTABLISHMENT.—Not later than 270 days
10 after the date of enactment of this Act, the Sec-
11 retary shall establish an advisory committee to be
12 known as the Unconventional Resources Technology
13 Advisory Committee.

14 (2) MEMBERSHIP.—The advisory committee
15 under this subsection shall be composed of members
16 appointed by the Secretary including—

17 (A) a majority of members who are em-
18 ployees or representatives of independent pro-
19 ducers of natural gas and other petroleum, in-
20 cluding small producers;

21 (B) individuals with extensive research ex-
22 perience or operational knowledge of unconven-
23 tional natural gas and other petroleum resource
24 exploration and production;

1 (C) individuals broadly representative of
2 the affected interests in unconventional natural
3 gas and other petroleum resource exploration
4 and production, including interests in environ-
5 mental protection and safe operations; and

6 (D) no individuals who are Federal em-
7 ployees.

8 (3) DUTIES.—The advisory committee under
9 this subsection shall advise the Secretary on the de-
10 velopment and implementation of activities under
11 this part related to unconventional natural gas and
12 other petroleum resources.

13 (4) COMPENSATION.—A member of the advi-
14 sory committee under this subsection shall serve
15 without compensation but shall receive travel ex-
16 penses in accordance with applicable provisions
17 under subchapter I of chapter 57 of title 5, United
18 States Code.

19 (c) PROHIBITION.—No advisory committee estab-
20 lished under this section shall make recommendations on
21 funding awards to particular consortia or other entities,
22 or for specific projects.

23 **SEC. 946. LIMITS ON PARTICIPATION.**

24 An entity shall be eligible to receive an award under
25 this part only if the Secretary finds—

1 (1) that the entity's participation in the pro-
2 gram under this part would be in the economic in-
3 terest of the United States; and

4 (2) that either—

5 (A) the entity is a United States-owned en-
6 tity organized under the laws of the United
7 States; or

8 (B) the entity is organized under the laws
9 of the United States and has a parent entity or-
10 ganized under the laws of a country that
11 affords—

12 (i) to United States-owned entities op-
13 portunities, comparable to those afforded
14 to any other entity, to participate in any
15 cooperative research venture similar to
16 those authorized under this part;

17 (ii) to United States-owned entities
18 local investment opportunities comparable
19 to those afforded to any other entity; and

20 (iii) adequate and effective protection
21 for the intellectual property rights of
22 United States-owned entities.

23 **SEC. 947. SUNSET.**

24 The authority provided by this part shall terminate
25 on September 30, 2011.

1 **SEC. 948. DEFINITIONS.**

2 In this part:

3 (1) DEEPWATER.—The term “deepwater”
4 means a water depth that is greater than 200 but
5 less than 1,500 meters.

6 (2) INDEPENDENT PRODUCER OF OIL OR
7 GAS.—

8 (A) IN GENERAL.—The term “independent
9 producer of oil or gas” means any person that
10 produces oil or gas other than a person to
11 whom subsection (c) of section 613A of the In-
12 ternal Revenue Code of 1986 does not apply by
13 reason of paragraph (2) (relating to certain re-
14 tailers) or paragraph (4) (relating to certain re-
15 finers) of section 613A(d) of such Code.

16 (B) RULES FOR APPLYING PARAGRAPHS (2)
17 AND (4) OF SECTION 613A(d).—For purposes of
18 subparagraph (A), paragraphs (2) and (4) of
19 section 613A(d) of the Internal Revenue Code
20 of 1986 shall be applied by substituting “cal-
21 endar year” for “taxable year” each place it ap-
22 pears in such paragraphs.

23 (3) PROGRAM CONSORTIUM.—The term “pro-
24 gram consortium” means the consortium selected
25 under section 942(d).

1 (4) REMOTE OR INCONSEQUENTIAL.—The term
2 “remote or inconsequential” has the meaning given
3 that term in regulations issued by the Office of Gov-
4 ernment Ethics under section 208(b)(2) of title 18,
5 United States Code.

6 (5) SMALL PRODUCER.—The term “small pro-
7 ducer” means an entity organized under the laws of
8 the United States with production levels of less than
9 1,000 barrels per day of oil equivalent.

10 (6) ULTRA-DEEPWATER.—The term “ultra-
11 deepwater” means a water depth that is equal to or
12 greater than 1,500 meters.

13 (7) ULTRA-DEEPWATER ARCHITECTURE.—The
14 term “ultra-deepwater architecture” means the inte-
15 gration of technologies for the exploration for, or
16 production of, natural gas or other petroleum re-
17 sources located at ultra-deepwater depths.

18 (8) ULTRA-DEEPWATER TECHNOLOGY.—The
19 term “ultra-deepwater technology” means a discrete
20 technology that is specially suited to address 1 or
21 more challenges associated with the exploration for,
22 or production of, natural gas or other petroleum re-
23 sources located at ultra-deepwater depths.

24 (9) UNCONVENTIONAL NATURAL GAS AND
25 OTHER PETROLEUM RESOURCE.—The term “uncon-

1 ventional natural gas and other petroleum resource”
2 means natural gas and other petroleum resource lo-
3 cated onshore in an economically inaccessible geo-
4 logical formation, including resources of small pro-
5 ducers.

6 **SEC. 949. FUNDING.**

7 (a) IN GENERAL.—

8 (1) OIL AND GAS LEASE INCOME.—For each of
9 fiscal years 2004 through 2013, from any Federal
10 royalties, rents, and bonuses derived from Federal
11 onshore and offshore oil and gas leases issued under
12 the Outer Continental Shelf Lands Act and the Min-
13 eral Leasing Act which are deposited in the Treas-
14 ury, and after distribution of any such funds as de-
15 scribed in subsection (c), \$150,000,000 shall be de-
16 posited into the Ultra-Deepwater and Unconven-
17 tional Natural Gas and Other Petroleum Research
18 Fund (in this section referred to as the Fund). For
19 purposes of this section, the term “royalties” ex-
20 cludes proceeds from the sale of royalty production
21 taken in kind and royalty production that is trans-
22 ferred under section 27(a)(3) of the Outer Conti-
23 nental Shelf Lands Act (43 U.S.C. 1353(a)(3)).

24 (2) AUTHORIZATION OF APPROPRIATIONS.—In
25 addition to amounts described in paragraph (1),

1 there are authorized to be appropriated to the Sec-
2 retary, to be deposited in the Fund, \$50,000,000 for
3 each of the fiscal years 2004 through 2013, to re-
4 main available until expended.

5 (b) OBLIGATIONAL AUTHORITY.—Monies in the
6 Fund shall be available to the Secretary for obligation
7 under this part without fiscal year limitation, to remain
8 available until expended.

9 (c) PRIOR DISTRIBUTIONS.—The distributions de-
10 scribed in subsection (a) are those required by law—

11 (A) to States and to the Reclamation Fund
12 under the Mineral Leasing Act (30 U.S.C.
13 191(a)); and

14 (B) to other funds receiving monies from
15 Federal oil and gas leasing programs,
16 including—

17 (i) any recipients pursuant to section
18 8(g) of the Outer Continental Shelf Lands
19 Act (43 U.S.C. 1337(g));

20 (ii) the Land and Water Conservation
21 Fund, pursuant to section 2(c) of the Land
22 and Water Conservation Fund Act of 1965
23 (16 U.S.C. 4601–5(c));

24 (iii) the Historic Preservation Fund,
25 pursuant to section 108 of the National

1 Historic Preservation Act (16 U.S.C.
2 470h); and

3 (iv) the Secure Energy Reinvestment
4 Fund.

5 (d) ALLOCATION.—Amounts obligated from the Fund
6 under this section in each fiscal year shall be allocated
7 as follows:

8 (1) 50 percent shall be for activities under sec-
9 tion 942.

10 (2) 35 percent shall be for activities under sec-
11 tion 943(d)(1).

12 (3) 10 percent shall be for activities under sec-
13 tion 943(d)(2).

14 (4) 5 percent shall be for research under section
15 941(d).

16 (e) FUND.—There is hereby established in the Treas-
17 ury of the United States a separate fund to be known as
18 the “Ultra-Deepwater and Unconventional Natural Gas
19 and Other Petroleum Research Fund”.

20 **Subtitle F—Science**

21 **SEC. 951. SCIENCE.**

22 (a) IN GENERAL.—The following sums are author-
23 ized to be appropriated to the Secretary for research, de-
24 velopment, demonstration, and commercial application ac-
25 tivities of the Office of Science, including activities author-

1 ized under this subtitle, including the amounts authorized
2 under the amendment made by section 958(c)(2)(C), and
3 including basic energy sciences, advanced scientific com-
4 puting research, biological and environmental research, fu-
5 sion energy sciences, high energy physics, nuclear physics,
6 and research analysis and infrastructure support:

7 (1) For fiscal year 2004, \$3,785,000,000.

8 (2) For fiscal year 2005, \$4,153,000,000.

9 (3) For fiscal year 2006, \$4,618,000,000.

10 (4) For fiscal year 2007, \$5,310,000,000.

11 (5) For fiscal year 2008, \$5,800,000,000.

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

14 (1) For activities of the Fusion Energy Sciences
15 Program, including activities under sections 952 and
16 953—

17 (A) for fiscal year 2004, \$335,000,000;

18 (B) for fiscal year 2005, \$349,000,000;

19 (C) for fiscal year 2006, \$362,000,000;

20 (D) for fiscal year 2007, \$377,000,000;

21 and

22 (E) for fiscal year 2008, \$393,000,000.

23 (2) For the Spallation Neutron Source—

24 (A) for construction in fiscal year 2004,
25 \$124,600,000;

1 (B) for construction in fiscal year 2005,
2 \$79,800,000;

3 (C) for completion of construction in fiscal
4 year 2006, \$41,100,000; and

5 (D) for other project costs (including re-
6 search and development necessary to complete
7 the project, preoperations costs, and capital
8 equipment related to construction),
9 \$103,279,000 for the period encompassing fis-
10 cal years 2003 through 2006, to remain avail-
11 able until expended through September 30,
12 2006.

13 (3) For Catalysis Research activities under sec-
14 tion 956—

15 (A) for fiscal year 2004, \$33,000,000;

16 (B) for fiscal year 2005, \$35,000,000;

17 (C) for fiscal year 2006, \$36,500,000;

18 (D) for fiscal year 2007, \$38,200,000; and

19 (E) for fiscal year 2008, \$40,100,000.

20 (4) For Nanoscale Science and Engineering Re-
21 search activities under section 957—

22 (A) for fiscal year 2004, \$270,000,000;

23 (B) for fiscal year 2005, \$292,000,000;

24 (C) for fiscal year 2006, \$322,000,000;

1 (D) for fiscal year 2007, \$355,000,000;

2 and

3 (E) for fiscal year 2008, \$390,000,000.

4 (5) For activities under section 957(c), from
5 the amounts authorized under paragraph (4) of this
6 subsection—

7 (A) for fiscal year 2004, \$135,000,000;

8 (B) for fiscal year 2005, \$150,000,000;

9 (C) for fiscal year 2006, \$120,000,000;

10 (D) for fiscal year 2007, \$100,000,000;

11 and

12 (E) for fiscal year 2008, \$125,000,000.

13 (6) For activities in the Genomes to Life Pro-
14 gram under section 959—

15 (A) for fiscal year 2004, \$100,000,000;

16 and

17 (B) for fiscal years 2005 through 2008,
18 such sums as may be necessary.

19 (7) For activities in the Energy-Water Supply
20 Program under section 961, \$30,000,000 for each of
21 fiscal years 2004 through 2008.

22 (c) ITER CONSTRUCTION.—In addition to the funds
23 authorized under subsection (b)(1), such sums as may be
24 necessary for costs associated with ITER construction,
25 consistent with limitations under section 952.

1 **SEC. 952. UNITED STATES PARTICIPATION IN ITER.**

2 (a) IN GENERAL.—The United States may partici-
3 pate in ITER in accordance with the provisions of this
4 section.

5 (b) AGREEMENT.—

6 (1) IN GENERAL.—The Secretary is authorized
7 to negotiate an agreement for United States partici-
8 pation in ITER.

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

11 (A) clearly define the United States finan-
12 cial contribution to construction and operating
13 costs;

14 (B) ensure that the share of ITER's high-
15 technology components manufactured in the
16 United States is at least proportionate to the
17 United States financial contribution to ITER;

18 (C) ensure that the United States will not
19 be financially responsible for cost overruns in
20 components manufactured in other ITER par-
21 ticipating countries;

22 (D) guarantee the United States full ac-
23 cess to all data generated by ITER;

24 (E) enable United States researchers to
25 propose and carry out an equitable share of the
26 experiments at ITER;

1 (F) provide the United States with a role
2 in all collective decisionmaking related to ITER;
3 and

4 (G) describe the process for discontinuing
5 or decommissioning ITER and any United
6 States role in those processes.

7 (c) PLAN.—The Secretary, in consultation with the
8 Fusion Energy Sciences Advisory Committee, shall de-
9 velop a plan for the participation of United States sci-
10 entists in ITER that shall include the United States re-
11 search agenda for ITER, methods to evaluate whether
12 ITER is promoting progress toward making fusion a reli-
13 able and affordable source of power, and a description of
14 how work at ITER will relate to other elements of the
15 United States fusion program. The Secretary shall request
16 a review of the plan by the National Academy of Sciences.

17 (d) LIMITATION.—No funds shall be expended for the
18 construction of ITER until the Secretary has transmitted
19 to Congress—

20 (1) the agreement negotiated pursuant to sub-
21 section (b) and 120 days have elapsed since that
22 transmission;

23 (2) a report describing the management struc-
24 ture of ITER and providing a fixed dollar estimate
25 of the cost of United States participation in the con-

1 construction of ITER, and 120 days have elapsed since
2 that transmission;

3 (3) a report describing how United States par-
4 ticipation in ITER will be funded without reducing
5 funding for other programs in the Office of Science,
6 including other fusion programs, and 60 days have
7 elapsed since that transmission; and

8 (4) the plan required by subsection (e) (but not
9 the National Academy of Sciences review of that
10 plan), and 60 days have elapsed since that trans-
11 mission.

12 (e) ALTERNATIVE TO ITER.—If at any time during
13 the negotiations on ITER, the Secretary determines that
14 construction and operation of ITER is unlikely or infeas-
15 ible, the Secretary shall send to Congress, as part of the
16 budget request for the following year, a plan for imple-
17 menting the domestic burning plasma experiment known
18 as FIRE, including costs and schedules for such a plan.
19 The Secretary shall refine such plan in full consultation
20 with the Fusion Energy Sciences Advisory Committee and
21 shall also transmit such plan to the National Academy of
22 Sciences for review.

23 (f) DEFINITIONS.—In this section and sections
24 951(b)(1) and (c):

1 (1) CONSTRUCTION.—The term “construction”
2 means the physical construction of the ITER facil-
3 ity, and the physical construction, purchase, or man-
4 ufacture of equipment or components that are spe-
5 cifically designed for the ITER facility, but does not
6 mean the design of the facility, equipment, or com-
7 ponents.

8 (2) FIRE.—The term “FIRE” means the Fu-
9 sion Ignition Research Experiment, the fusion re-
10 search experiment for which design work has been
11 supported by the Department as a possible alter-
12 native burning plasma experiment in the event that
13 ITER fails to move forward.

14 (3) ITER.—The term “ITER” means the
15 international burning plasma fusion research project
16 in which the President announced United States
17 participation on January 30, 2003.

18 **SEC. 953. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.**

19 (a) DECLARATION OF POLICY.—It shall be the policy
20 of the United States to conduct research, development,
21 demonstration, and commercial application to provide for
22 the scientific, engineering, and commercial infrastructure
23 necessary to ensure that the United States is competitive
24 with other nations in providing fusion energy for its own
25 needs and the needs of other nations, including by dem-

1 onstrating electric power or hydrogen production for the
2 United States energy grid utilizing fusion energy at the
3 earliest date possible.

4 (b) PLANNING.—

5 (1) IN GENERAL.—Not later than 180 days
6 after the date of enactment of this Act, the Sec-
7 retary shall present to Congress a plan, with pro-
8 posed cost estimates, budgets, and potential inter-
9 national partners, for the implementation of the pol-
10 icy described in subsection (a). The plan shall ensure
11 that—

12 (A) existing fusion research facilities are
13 more fully utilized;

14 (B) fusion science, technology, theory, ad-
15 vanced computation, modeling, and simulation
16 are strengthened;

17 (C) new magnetic and inertial fusion re-
18 search facilities are selected based on scientific
19 innovation, cost effectiveness, and their poten-
20 tial to advance the goal of practical fusion en-
21 ergy at the earliest date possible, and those that
22 are selected are funded at a cost-effective rate;

23 (D) communication of scientific results and
24 methods between the fusion energy science com-

1 community and the broader scientific and tech-
2 nology communities is improved;

3 (E) inertial confinement fusion facilities
4 are utilized to the extent practicable for the
5 purpose of inertial fusion energy research and
6 development; and

7 (F) attractive alternative inertial and mag-
8 netic fusion energy approaches are more fully
9 explored.

10 (2) COSTS AND SCHEDULES.—Such plan shall
11 also address the status of and, to the degree pos-
12 sible, costs and schedules for—

13 (A) in coordination with the program
14 under section 960, the design and implementa-
15 tion of international or national facilities for the
16 testing of fusion materials; and

17 (B) the design and implementation of
18 international or national facilities for the test-
19 ing and development of key fusion technologies.

20 **SEC. 954. SPALLATION NEUTRON SOURCE.**

21 (a) DEFINITION.—For the purposes of this section,
22 the term “Spallation Neutron Source” means Department
23 Project 99–E–334, Oak Ridge National Laboratory, Oak
24 Ridge, Tennessee.

1 (b) REPORT.—The Secretary shall report on the
2 Spallation Neutron Source as part of the Department’s
3 annual budget submission, including a description of the
4 achievement of milestones, a comparison of actual costs
5 to estimated costs, and any changes in estimated project
6 costs or schedule.

7 (c) LIMITATIONS.—The total amount obligated by the
8 Department, including prior year appropriations, for the
9 Spallation Neutron Source shall not exceed—

10 (1) \$1,192,700,000 for costs of construction;

11 (2) \$219,000,000 for other project costs; and

12 (3) \$1,411,700,000 for total project cost.

13 **SEC. 955. SUPPORT FOR SCIENCE AND ENERGY FACILITIES**
14 **AND INFRASTRUCTURE.**

15 (a) FACILITY AND INFRASTRUCTURE POLICY.—The
16 Secretary shall develop and implement a strategy for fa-
17 cilities and infrastructure supported primarily from the
18 Office of Science, the Office of Energy Efficiency and Re-
19 newable Energy, the Office of Fossil Energy, or the Office
20 of Nuclear Energy, Science, and Technology Programs at
21 all National Laboratories and single-purpose research fa-
22 cilities. Such strategy shall provide cost-effective means
23 for—

24 (1) maintaining existing facilities and infra-
25 structure, as needed;

- 1 (2) closing unneeded facilities;
- 2 (3) making facility modifications; and
- 3 (4) building new facilities.

4 (b) REPORT.—

5 (1) IN GENERAL.—The Secretary shall prepare
6 and transmit, along with the President’s budget re-
7 quest to Congress for fiscal year 2006, a report con-
8 taining the strategy developed under subsection (a).

9 (2) CONTENTS.—For each National Laboratory
10 and single-purpose research facility, for the facilities
11 primarily used for science and energy research, such
12 report shall contain—

13 (A) the current priority list of proposed fa-
14 cilities and infrastructure projects, including
15 cost and schedule requirements;

16 (B) a current 10-year plan that dem-
17 onstrates the reconfiguration of its facilities and
18 infrastructure to meet its missions and to ad-
19 dress its long-term operational costs and return
20 on investment;

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

23 (D) the current status of each facility and
24 infrastructure project compared to the original
25 baseline cost, schedule, and scope.

1 **SEC. 956. CATALYSIS RESEARCH AND DEVELOPMENT PRO-**
2 **GRAM.**

3 (a) ESTABLISHMENT.—The Secretary, through the
4 Office of Science, shall support a program of research and
5 development in catalysis science consistent with the De-
6 partment's statutory authorities related to research and
7 development. The program shall include efforts to—

8 (1) enable catalyst design using combinations of
9 experimental and mechanistic methodologies coupled
10 with computational modeling of catalytic reactions at
11 the molecular level;

12 (2) develop techniques for high throughput syn-
13 thesis, assay, and characterization at nanometer and
14 subnanometer scales in situ under actual operating
15 conditions;

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

18 (4) conduct research on the use of precious
19 metals for catalysis; and

20 (5) translate molecular understanding to the
21 design of catalytic compounds.

22 (b) DUTIES OF THE OFFICE OF SCIENCE.—In car-
23 rying out the program under this section, the Director of
24 the Office of Science shall—

1 (1) support both individual investigators and
2 multidisciplinary teams of investigators to pioneer
3 new approaches in catalytic design;

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

8 (3) support technology transfer activities to
9 benefit industry and other users of catalysis science
10 and engineering; and

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

13 (c) TRIENNIAL ASSESSMENT.—The National Acad-
14 emy of Sciences shall review the catalysis program every
15 3 years to report on gains made in the fundamental
16 science of catalysis and its progress towards developing
17 new fuels for energy production and material fabrication
18 processes.

19 **SEC. 957. NANOSCALE SCIENCE AND ENGINEERING RE-**
20 **SEARCH, DEVELOPMENT, DEMONSTRATION,**
21 **AND COMMERCIAL APPLICATION.**

22 (a) ESTABLISHMENT.—The Secretary, acting
23 through the Office of Science, shall support a program of
24 research, development, demonstration, and commercial ap-
25 plication in nanoscience and nanoengineering. The pro-

1 gram shall include efforts to further the understanding of
2 the chemistry, physics, materials science, and engineering
3 of phenomena on the scale of nanometers and to apply
4 that knowledge to the Department's mission areas.

5 (b) DUTIES OF THE OFFICE OF SCIENCE.—In car-
6 rying out the program under this section, the Office of
7 Science shall—

8 (1) support both individual investigators and
9 teams of investigators, including multidisciplinary
10 teams;

11 (2) carry out activities under subsection (c);

12 (3) support technology transfer activities to
13 benefit industry and other users of nanoscience and
14 nanoengineering;

15 (4) coordinate research and development activi-
16 ties with other Department programs, industry, and
17 other Federal agencies;

18 (5) ensure that societal and ethical concerns
19 will be addressed as the technology is developed by—

20 (A) establishing a research program to
21 identify societal and ethical concerns related to
22 nanotechnology, and ensuring that the results
23 of such research are widely disseminated; and

1 (B) integrating, insofar as possible, re-
2 search on societal and ethical concerns with
3 nanotechnology research and development; and
4 (6) ensure that the potential of nanotechnology
5 to produce or facilitate the production of clean, inex-
6 pensive energy is realized by supporting
7 nanotechnology energy applications research and de-
8 velopment.

9 (c) NANOSCIENCE AND NANOENGINEERING RE-
10 SEARCH CENTERS AND MAJOR INSTRUMENTATION.—

11 (1) IN GENERAL.—The Secretary shall carry
12 out projects to develop, plan, construct, acquire, op-
13 erate, or support special equipment, instrumenta-
14 tion, or facilities for investigators conducting re-
15 search and development in nanoscience and
16 nanoengineering.

17 (2) ACTIVITIES.—Projects under paragraph (1)
18 may include the measurement of properties at the
19 scale of nanometers, manipulation at such scales,
20 and the integration of technologies based on
21 nanoscience or nanoengineering into bulk materials
22 or other technologies.

23 (3) FACILITIES.—Facilities under paragraph
24 (1) may include electron microcharacterization facili-

1 ties, microlithography facilities, scanning probe fa-
2 cilities, and related instrumentation.

3 (4) COLLABORATIONS.—The Secretary shall en-
4 courage collaborations among Department programs,
5 institutions of higher education, laboratories, and in-
6 dustry at facilities under this subsection.

7 **SEC. 958. ADVANCED SCIENTIFIC COMPUTING FOR ENERGY**
8 **MISSIONS.**

9 (a) IN GENERAL.—The Secretary, acting through the
10 Office of Science, shall support a program to advance the
11 Nation's computing capability across a diverse set of
12 grand challenge, computationally based, science problems
13 related to departmental missions.

14 (b) DUTIES OF THE OFFICE OF SCIENCE.—In car-
15 rying out the program under this section, the Office of
16 Science shall—

17 (1) advance basic science through computation
18 by developing software to solve grand challenge
19 science problems on new generations of computing
20 platforms in collaboration with other Department
21 program offices;

22 (2) enhance the foundations for scientific com-
23 puting by developing the basic mathematical and
24 computing systems software needed to take full ad-
25 vantage of the computing capabilities of computers

1 with peak speeds of 100 teraflops or more, some of
2 which may be unique to the scientific problem of in-
3 terest;

4 (3) enhance national collaboratory and net-
5 working capabilities by developing software to inte-
6 grate geographically separated researchers into ef-
7 fective research teams and to facilitate access to and
8 movement and analysis of large (petabyte) data sets;

9 (4) develop and maintain a robust scientific
10 computing hardware infrastructure to ensure that
11 the computing resources needed to address depart-
12 mental missions are available; and

13 (5) explore new computing approaches and
14 technologies that promise to advance scientific com-
15 puting, including developments in quantum com-
16 puting.

17 (c) HIGH-PERFORMANCE COMPUTING ACT OF 1991
18 AMENDMENTS.—The High-Performance Computing Act
19 of 1991 is amended—

20 (1) in section 4 (15 U.S.C. 5503)—

21 (A) in paragraph (3) by striking “means”
22 and inserting “and networking and information
23 technology mean”, and by striking “(including
24 vector supercomputers and large scale parallel
25 systems)”; and

1 (B) in paragraph (4), by striking “packet
2 switched”; and
3 (2) in section 203 (15 U.S.C. 5523)—

4 (A) in subsection (a), by striking all after
5 “As part of the” and inserting “Networking
6 and Information Technology Research and De-
7 velopment Program, the Secretary of Energy
8 shall conduct basic and applied research in net-
9 working and information technology, with em-
10 phasis on supporting fundamental research in
11 the physical sciences and engineering, and en-
12 ergy applications; providing supercomputer ac-
13 cess and advanced communication capabilities
14 and facilities to scientific researchers; and de-
15 veloping tools for distributed scientific collabo-
16 ration.”;

17 (B) in subsection (b), by striking “Pro-
18 gram” and inserting “Networking and Informa-
19 tion Technology Research and Development
20 Program”; and

21 (C) by amending subsection (e) to read as
22 follows:

23 “(e) AUTHORIZATION OF APPROPRIATIONS.—There
24 are authorized to be appropriated to the Secretary of En-
25 ergy to carry out the Networking and Information Tech-

1 nology Research and Development Program such sums as
2 may be necessary for fiscal years 2004 through 2008.”.

3 (d) COORDINATION.—The Secretary shall ensure that
4 the program under this section is integrated and con-
5 sistent with—

6 (1) the Advanced Simulation and Computing
7 Program, formerly known as the Accelerated Stra-
8 tegic Computing Initiative, of the National Nuclear
9 Security Administration; and

10 (2) other national efforts related to advanced
11 scientific computing for science and engineering.

12 (e) REPORT.—

13 (1) IN GENERAL.—Before undertaking any new
14 initiative to develop any new advanced architecture
15 for high-speed computing, the Secretary, through the
16 Director of the Office of Science, shall transmit a re-
17 port to Congress describing—

18 (A) the expected duration and cost of the
19 initiative;

20 (B) the technical milestones the initiative
21 is designed to achieve;

22 (C) how institutions of higher education
23 and private firms will participate in the initia-
24 tive; and

1 (D) why the goals of the initiative could
2 not be achieved through existing programs.

3 (2) LIMITATION.—No funds may be expended
4 on any initiative described in paragraph (1) until 30
5 days after the report required by that paragraph is
6 transmitted to Congress.

7 **SEC. 959. GENOMES TO LIFE PROGRAM.**

8 (a) PROGRAM.—

9 (1) ESTABLISHMENT.—The Secretary shall es-
10 tablish a research, development, and demonstration
11 program in genetics, protein science, and computa-
12 tional biology to support the energy, national secu-
13 rity, and environmental mission of the Department.

14 (2) GRANTS.—The program shall support indi-
15 vidual investigators and multidisciplinary teams of
16 investigators through competitive, merit-reviewed
17 grants.

18 (3) CONSULTATION.—In carrying out the pro-
19 gram, the Secretary shall consult with other Federal
20 agencies that conduct genetic and protein research.

21 (b) GOALS.—The program shall have the goal of de-
22 veloping technologies and methods based on the biological
23 functions of genomes, microbes, and plants that—

24 (1) can facilitate the production of fuels, includ-
25 ing hydrogen;

1 (2) convert carbon dioxide to organic carbon;

2 (3) improve national security and combat ter-
3 rorism;

4 (4) detoxify soils and water at Department fa-
5 cilities contaminated with heavy metals and radio-
6 logical materials; and

7 (5) address other Department missions as iden-
8 tified by the Secretary.

9 (c) PLAN.—

10 (1) DEVELOPMENT OF PLAN.—Not later than 1
11 year after the date of enactment of this Act, the
12 Secretary shall prepare and transmit to Congress a
13 research plan describing how the program author-
14 ized pursuant to this section will be undertaken to
15 accomplish the program goals established in sub-
16 section (b).

17 (2) REVIEW OF PLAN.—The Secretary shall
18 contract with the National Academy of Sciences to
19 review the research plan developed under this sub-
20 section. The Secretary shall transmit the review to
21 Congress not later than 18 months after transmittal
22 of the research plan under paragraph (1), along with
23 the Secretary's response to the recommendations
24 contained in the review.

1 (d) GENOMES TO LIFE USER FACILITIES AND AN-
2 CILLARY EQUIPMENT.—

3 (1) IN GENERAL.—Within the funds authorized
4 to be appropriated pursuant to this Act, the
5 amounts specified under section 951(b)(6) shall,
6 subject to appropriations, be available for projects to
7 develop, plan, construct, acquire, or operate special
8 equipment, instrumentation, or facilities for inves-
9 tigators conducting research, development, dem-
10 onstration, and commercial application in systems
11 biology and proteomics and associated biological dis-
12 ciplines.

13 (2) FACILITIES.—Facilities under paragraph
14 (1) may include facilities, equipment, or instrumen-
15 tation for—

16 (A) the production and characterization of
17 proteins;

18 (B) whole proteome analysis;

19 (C) characterization and imaging of molec-
20 ular machines; and

21 (D) analysis and modeling of cellular sys-
22 tems.

23 (3) COLLABORATIONS.—The Secretary shall en-
24 courage collaborations among universities, labora-
25 tories, and industry at facilities under this sub-

1 section. All facilities under this subsection shall have
2 a specific mission of technology transfer to other in-
3 stitutions.

4 (e) PROHIBITION ON BIOMEDICAL AND HUMAN CELL
5 AND HUMAN SUBJECT RESEARCH.—

6 (1) NO BIOMEDICAL RESEARCH.—In carrying
7 out the program under this section, the Secretary
8 shall not conduct biomedical research.

9 (2) LIMITATIONS.—Nothing in this section shall
10 authorize the Secretary to conduct any research or
11 demonstrations—

12 (A) on human cells or human subjects; or

13 (B) designed to have direct application
14 with respect to human cells or human subjects.

15 **SEC. 960. FISSION AND FUSION ENERGY MATERIALS RE-**
16 **SEARCH PROGRAM.**

17 In the President's fiscal year 2006 budget request,
18 the Secretary shall establish a research and development
19 program on material science issues presented by advanced
20 fission reactors and the Department's fusion energy pro-
21 gram. The program shall develop a catalog of material
22 properties required for these applications, develop theo-
23 retical models for materials possessing the required prop-
24 erties, benchmark models against existing data, and de-

1 velop a roadmap to guide further research and develop-
2 ment in this area.

3 **SEC. 961. ENERGY-WATER SUPPLY PROGRAM.**

4 (a) ESTABLISHMENT.—There is established within
5 the Department the Energy-Water Supply Program, to
6 study energy-related and certain other issues associated
7 with the supply of drinking water and operation of com-
8 munity water systems and to study water supply issues
9 related to energy.

10 (b) DEFINITIONS.—For the purposes of this section:

11 (1) ADMINISTRATOR.—The term “Adminis-
12 trator” means the Administrator of the Environ-
13 mental Protection Agency.

14 (2) AGENCY.—The term “Agency” means the
15 Environmental Protection Agency.

16 (3) FOUNDATION.—The term “Foundation”
17 means the American Water Works Association Re-
18 search Foundation.

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

23 (5) PROGRAM.—The term “Program” means
24 the Energy-Water Supply Program established by
25 this section.

1 (c) PROGRAM AREAS.—The Program shall develop
2 methods, means, procedures, equipment, and improved
3 technologies relating to—

4 (1) the arsenic removal program under sub-
5 section (d);

6 (2) the desalination program under subsection
7 (e); and

8 (3) the water and energy sustainability program
9 under subsection (f).

10 (d) ARSENIC REMOVAL PROGRAM.—

11 (1) IN GENERAL.—As soon as practicable after
12 the date of enactment of this Act, the Secretary, in
13 coordination with the Administrator and in partner-
14 ship with the Foundation, shall utilize the facilities,
15 institutions, and relationships established in the
16 Consolidated Appropriations Resolution, 2003 as de-
17 scribed in Senate Report 107–220 to carry out a re-
18 search program to provide innovative methods and
19 means for removal of arsenic.

20 (2) REQUIRED EVALUATIONS.—The program
21 shall, to the maximum extent practicable, evaluate
22 the means of—

23 (A) reducing energy costs incurred in
24 using arsenic removal technologies;

1 (B) minimizing materials, operating, and
2 maintenance costs; and

3 (C) minimizing any quantities of waste (es-
4 pecially hazardous waste) that result from use
5 of arsenic removal technologies.

6 (3) PEER REVIEW.—Where applicable and rea-
7 sonably available, projects undertaken under this
8 subsection shall be peer-reviewed.

9 (4) COMMUNITY WATER SYSTEMS.—In carrying
10 out the program under this subsection, the Sec-
11 retary, in coordination with the Administrator,
12 shall—

13 (A) select projects involving a geographi-
14 cally and hydrologically diverse group of com-
15 munity water systems (as defined in section
16 1003 of the Public Health Service Act (42
17 U.S.C. 300)) and water chemistries, that have
18 experienced technical or economic difficulties in
19 providing drinking water with levels of arsenic
20 at 10 parts-per-billion or lower, which projects
21 shall be designed to develop innovative methods
22 and means to deliver drinking water that con-
23 tains less than 10 parts per billion of arsenic;
24 and

1 (B) provide not less than 40 percent of all
2 funds spent pursuant to this subsection to ad-
3 dress the needs of, and in collaboration with,
4 rural communities or Indian tribes.

5 (5) COST EFFECTIVENESS.—The Foundation
6 shall create methods for determining cost effective-
7 ness of arsenic removal technologies used in the pro-
8 gram.

9 (6) EDUCATION, TRAINING, AND TECH-
10 NOLOGY.—The Foundation shall include education,
11 training, and technology transfer as part of the pro-
12 gram.

13 (7) COORDINATION.—The Secretary shall con-
14 sult with the Administrator to ensure that all activi-
15 ties conducted under the program are coordinated
16 with the Agency and do not duplicate other pro-
17 grams in the Agency and other Federal agencies,
18 State programs, and academia.

19 (8) REPORTS.—Not later than 1 year after the
20 date of commencement of the program under this
21 subsection, and once every year thereafter, the Sec-
22 retary shall submit to the Committee on Energy and
23 Commerce of the House of Representatives and the
24 Committee on Environment and Public Works and
25 the Committee on Energy and Natural Resources of

1 the Senate a report on the results of the program
2 under this subsection.

3 (e) DESALINATION PROGRAM.—

4 (1) IN GENERAL.—The Secretary, in coopera-
5 tion with the Commissioner of Reclamation of the
6 Department of the Interior, shall carry out a pro-
7 gram to conduct research and develop methods and
8 means for desalination in accordance with the desali-
9 nation technology progress plan developed under
10 title II of the Energy and Water Development Ap-
11 propriations Act, 2002 (115 Stat. 498), and de-
12 scribed in Senate Report 107–39 under the heading
13 “WATER AND RELATED RESOURCES” in the “BU-
14 REAU OF RECLAMATION” section.

15 (2) REQUIREMENTS.—The desalination pro-
16 gram shall—

17 (A) use the resources of the Department
18 and the Department of the Interior that were
19 involved in the development of the 2003 Na-
20 tional Desalination and Water Purification
21 Technology Roadmap for next-generation de-
22 salination technology;

23 (B) focus on technologies that are appro-
24 priate for use in desalinating brackish ground-
25 water, drinking water, wastewater and other sa-

1 line water supplies, or disposal of residual brine
2 or salt; and

3 (C) consider the use of renewable energy
4 sources.

5 (3) CONSTRUCTION PROJECTS.—Funds made
6 available to carry out this subsection may be used
7 for construction projects, including completion of the
8 National Desalination Research Center for brackish
9 groundwater and ongoing operational costs of this
10 facility.

11 (4) STEERING COMMITTEE.—The Secretary and
12 the Commissioner of Reclamation of the Department
13 of the Interior shall jointly establish a steering com-
14 mittee for activities conducted under this subsection.
15 The steering committee shall be jointly chaired by 1
16 representative from the program and 1 representa-
17 tive from the Bureau of Reclamation.

18 (f) WATER AND ENERGY SUSTAINABILITY PRO-
19 GRAM.—

20 (1) IN GENERAL.—The Secretary shall develop
21 a program to identify methods, means, procedures,
22 equipment, and improved technologies necessary to
23 ensure that sufficient quantities of water are avail-
24 able to meet energy needs and sufficient energy is
25 available to meet water needs.

1 (2) ASSESSMENTS.—In order to acquire infor-
2 mation and avoid duplication, the Secretary shall
3 work in collaboration with the Secretary of the Inte-
4 rior, the Army Corps of Engineers, the Adminis-
5 trator, the Secretary of Commerce, the Secretary of
6 Defense, relevant State agencies, nongovernmental
7 organizations, and academia, to assess—

8 (A) future water resources needed to sup-
9 port energy development and production within
10 the United States including water used for hy-
11 dropower, and production of, or electricity gen-
12 eration by, hydrogen, biomass, fossil fuels, and
13 nuclear fuel;

14 (B) future energy resources needed to sup-
15 port water purification and wastewater treat-
16 ment, including desalination and water convey-
17 ance;

18 (C) use of impaired and nontraditional
19 water supplies for energy production other than
20 oil and gas extraction;

21 (D) technology and programs for improv-
22 ing water use efficiency; and

23 (E) technologies to reduce water use in en-
24 ergy development and production.

25 (3) ROADMAP; TOOLS.—The Secretary shall—

1 (A) develop a program plan and technology
2 development roadmap for the Water and En-
3 ergy Sustainability Program to identify sci-
4 entific and technical requirements and activities
5 that are required to support planning for en-
6 ergy sustainability under current and potential
7 future conditions of water availability, use of
8 impaired water for energy production and other
9 uses, and reduction of water use in energy de-
10 velopment and production;

11 (B) develop tools for national and local en-
12 ergy and water sustainability planning, includ-
13 ing numerical models, decision analysis tools,
14 economic analysis tools, databases, and plan-
15 ning methodologies and strategies;

16 (C) implement at least 3 planning projects
17 involving energy development or production that
18 use the tools described in subparagraph (B)
19 and assess the viability of those tools at the
20 scale of river basins with at least 1 demonstra-
21 tion involving an international border; and

22 (D) transfer those tools to other Federal
23 agencies, State agencies, nonprofit organiza-
24 tions, industry, and academia.

1 (4) REPORT.—Not later than 1 year after the
2 date of enactment of this Act, the Secretary shall
3 submit to Congress a report on the Water and En-
4 ergy Sustainability Program that—

5 (A) includes the results of the assessment
6 under paragraph (2) and the program plan and
7 technology development roadmap; and

8 (B) identifies policy, legal, and institu-
9 tional issues related to water and energy sus-
10 tainability.

11 **SEC. 962. NITROGEN FIXATION.**

12 The Secretary, acting through the Office of Science,
13 shall support a program of research, development, dem-
14 onstration, and commercial application on biological nitro-
15 gen fixation, including plant genomics research relevant
16 to the development of commercial crop varieties with en-
17 hanced nitrogen fixation efficiency and ability.

18 **Subtitle G—Energy and**
19 **Environment**

20 **SEC. 964. UNITED STATES-MEXICO ENERGY TECHNOLOGY**
21 **COOPERATION.**

22 (a) PROGRAM.—The Secretary shall establish a re-
23 search, development, demonstration, and commercial ap-
24 plication program to be carried out in collaboration with
25 entities in Mexico and the United States to promote en-

1 ergy efficient, environmentally sound economic develop-
2 ment along the United States-Mexico border that mini-
3 mizes public health risks from industrial activities in the
4 border region.

5 (b) PROGRAM MANAGEMENT.—The program under
6 subsection (a) shall be managed by the Department of En-
7 ergy Carlsbad Environmental Management Field Office.

8 (c) TECHNOLOGY TRANSFER.—In carrying out
9 projects and activities under this section, the Secretary
10 shall assess the applicability of technology developed under
11 the Environmental Management Science Program of the
12 Department.

13 (d) INTELLECTUAL PROPERTY.—In carrying out this
14 section, the Secretary shall comply with the requirements
15 of any agreement entered into between the United States
16 and Mexico regarding intellectual property protection.

17 (e) AUTHORIZATION OF APPROPRIATIONS.—The fol-
18 lowing sums are authorized to be appropriated to the Sec-
19 retary to carry out activities under this section:

20 (1) For each of fiscal years 2004 and 2005,
21 \$5,000,000.

22 (2) For each of fiscal years 2006, 2007, and
23 2008, \$6,000,000.

1 **SEC. 965. WESTERN HEMISPHERE ENERGY COOPERATION.**

2 (a) PROGRAM.—The Secretary shall carry out a pro-
3 gram to promote cooperation on energy issues with West-
4 ern Hemisphere countries.

5 (b) ACTIVITIES.—Under the program, the Secretary
6 shall fund activities to work with Western Hemisphere
7 countries to—

8 (1) assist the countries in formulating and
9 adopting changes in economic policies and other poli-
10 cies to—

11 (A) increase the production of energy sup-
12 plies; and

13 (B) improve energy efficiency; and

14 (2) assist in the development and transfer of
15 energy supply and efficiency technologies that would
16 have a beneficial impact on world energy markets.

17 (c) UNIVERSITY PARTICIPATION.—To the extent
18 practicable, the Secretary shall carry out the program
19 under this section with the participation of universities so
20 as to take advantage of the acceptance of universities by
21 Western Hemisphere countries as sources of unbiased
22 technical and policy expertise when assisting the Secretary
23 in—

24 (1) evaluating new technologies;

25 (2) resolving technical issues;

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

3 (4) training policymakers, particularly in the
4 case of universities that involve the participation of
5 minority students, such as Hispanic-serving institu-
6 tions and Historically Black Colleges and Univer-
7 sities.

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

11 (1) \$8,000,000 for fiscal year 2004;

12 (2) \$10,000,000 for fiscal year 2005;

13 (3) \$13,000,000 for fiscal year 2006;

14 (4) \$16,000,000 for fiscal year 2007; and

15 (5) \$19,000,000 for fiscal year 2008.

16 **SEC. 966. WASTE REDUCTION AND USE OF ALTERNATIVES.**

17 (a) **GRANT AUTHORITY.**—The Secretary may make
18 a single grant to a qualified institution to examine and
19 develop the feasibility of burning post-consumer carpet in
20 cement kilns as an alternative energy source. The pur-
21 poses of the grant shall include determining—

22 (1) how post-consumer carpet can be burned
23 without disrupting kiln operations;

24 (2) the extent to which overall kiln emissions
25 may be reduced;

1 (3) the emissions of air pollutants and other
2 relevant environmental impacts; and

3 (4) how this process provides benefits to both
4 cement kiln operations and carpet suppliers.

5 (b) QUALIFIED INSTITUTION.—For the purposes of
6 subsection (a), a qualified institution is a research-inten-
7 sive institution of higher education with demonstrated ex-
8 pertise in the fields of fiber recycling and logistical mod-
9 eling of carpet waste collection and preparation.

10 (c) AUTHORIZATION OF APPROPRIATIONS.—There
11 are authorized to be appropriated to the Secretary for car-
12 rying out this section \$500,000.

13 **SEC. 967. REPORT ON FUEL CELL TEST CENTER.**

14 (a) REPORT.—Not later than 1 year after the date
15 of enactment of this Act, the Secretary shall transmit to
16 Congress a report on the results of a study of the estab-
17 lishment of a test center for next-generation fuel cells at
18 an institution of higher education that has available a con-
19 tinuous source of hydrogen and access to the electric
20 transmission grid. Such report shall include a conceptual
21 design for such test center and a projection of the costs
22 of establishing the test center.

23 (b) AUTHORIZATION OF APPROPRIATIONS.—There
24 are authorized to be appropriated to the Secretary for car-
25 rying out this section \$500,000.

1 **SEC. 968. ARCTIC ENGINEERING RESEARCH CENTER.**

2 (a) IN GENERAL.—The Secretary of Energy (referred
3 to in this section as the “Secretary”) in consultation with
4 the Secretary of Transportation and the United States
5 Arctic Research Commission shall provide annual grants
6 to a university located adjacent to the Arctic Energy Of-
7 fice of the Department of Energy, to establish and operate
8 a university research center to be headquartered in Fair-
9 banks and to be known as the “Arctic Engineering Re-
10 search Center” (referred to in this section as the “Cen-
11 ter”).

12 (b) PURPOSE.—The purpose of the Center shall be
13 to conduct research on, and develop improved methods of,
14 construction and use of materials to improve the overall
15 performance of roads, bridges, residential, commercial,
16 and industrial structures, and other infrastructure in the
17 Arctic region, with an emphasis on developing—

18 (1) new construction techniques for roads,
19 bridges, rail, and related transportation infrastruc-
20 ture and residential, commercial, and industrial in-
21 frastructure that are capable of withstanding the
22 Arctic environment and using limited energy re-
23 sources as efficiently as possible;

24 (2) technologies and procedures for increasing
25 road, bridge, rail, and related transportation infra-
26 structure and residential, commercial, and industrial

1 infrastructure safety, reliability, and integrity in the
2 Arctic region;

3 (3) new materials and improving the perform-
4 ance and energy efficiency of existing materials for
5 the construction of roads, bridges, rail, and related
6 transportation infrastructure and residential, com-
7 mercial, and industrial infrastructure in the Arctic
8 region; and

9 (4) recommendations for new local, regional,
10 and State permitting and building codes to ensure
11 transportation and building safety and efficient en-
12 ergy use when constructing, using, and occupying
13 such infrastructure in the Arctic region.

14 (c) OBJECTIVES.—The Center shall carry out—

15 (1) basic and applied research in the subjects
16 described in subsection (b), the products of which
17 shall be judged by peers or other experts in the field
18 to advance the body of knowledge in road, bridge,
19 rail, and infrastructure engineering in the Arctic re-
20 gion; and

21 (2) an ongoing program of technology transfer
22 that makes research results available to potential
23 users in a form that can be implemented.

24 (d) AMOUNT OF GRANT.—For each of fiscal years
25 2004 through 2009, the Secretary shall provide a grant

1 in the amount of \$3,000,000 to the institution specified
2 in subsection (a) to carry out this section.

3 (e) AUTHORIZATION OF APPROPRIATIONS.—There
4 are authorized to be appropriated to carry out this section
5 \$3,000,000 for each of fiscal years 2004 through 2009.

6 **SEC. 969. BARROW GEOPHYSICAL RESEARCH FACILITY.**

7 (a) ESTABLISHMENT.—The Secretary of Commerce,
8 in consultation with the Secretaries of Energy and the In-
9 terior, the Director of the National Science Foundation,
10 and the Administrator of the Environmental Protection
11 Agency, shall establish a joint research facility in Barrow,
12 Alaska, to be known as the “Barrow Geophysical Research
13 Facility”, to support scientific research activities in the
14 Arctic.

15 (b) AUTHORIZATION OF APPROPRIATIONS.—There
16 are authorized to be appropriated to the Secretaries of
17 Commerce, Energy, and the Interior, the Director of the
18 National Science Foundation, and the Administrator of
19 the Environmental Protection Agency for the planning,
20 design, construction, and support of the Barrow Geo-
21 physical Research Facility \$61,000,000.

22 **SEC. 970. WESTERN MICHIGAN DEMONSTRATION PROJECT.**

23 The Administrator of the Environmental Protection
24 Agency, in consultation with the State of Michigan and
25 affected local officials, shall conduct a demonstration

1 project to address the effect of transported ozone and
2 ozone precursors in Southwestern Michigan. The dem-
3 onstration program shall address a projected nonattain-
4 ment area in Southwestern Michigan that includes coun-
5 ties with design values for ozone of less than .095 based
6 on years 2000 to 2002 or the most current 3-year period
7 of air quality data. The Administrator shall assess any dif-
8 ficulties such area may experience in meeting the 8 hour
9 national ambient air quality standard for ozone due to the
10 effect of transported ozone or ozone precursors into the
11 area. The Administrator shall work with State and local
12 officials to determine the extent of ozone and ozone pre-
13 cursor transport, to assess alternatives to achieve compli-
14 ance with the 8 hour standard apart from local controls,
15 and to determine the timeframe in which such compliance
16 could take place. The Administrator shall complete this
17 demonstration project no later than 2 years after the date
18 of enactment of this section and shall not impose any re-
19 quirement or sanction that might otherwise apply during
20 the pendency of the demonstration project.

21 **Subtitle H—Management**

22 **SEC. 971. AVAILABILITY OF FUNDS.**

23 Funds authorized to be appropriated to the Depart-
24 ment under this title shall remain available until expended.

1 **SEC. 972. COST SHARING.**

2 (a) RESEARCH AND DEVELOPMENT.—Except as oth-
3 erwise provided in this title, for research and development
4 programs carried out under this title the Secretary shall
5 require a commitment from non-Federal sources of at
6 least 20 percent of the cost of the project. The Secretary
7 may reduce or eliminate the non-Federal requirement
8 under this subsection if the Secretary determines that the
9 research and development is of a basic or fundamental na-
10 ture or involves technical analyses or educational activi-
11 ties.

12 (b) DEMONSTRATION AND COMMERCIAL APPLICA-
13 TION.—Except as otherwise provided in this title, the Sec-
14 retary shall require at least 50 percent of the costs directly
15 and specifically related to any demonstration or commer-
16 cial application project under this title to be provided from
17 non-Federal sources. The Secretary may reduce the non-
18 Federal requirement under this subsection if the Secretary
19 determines that the reduction is necessary and appropriate
20 considering the technological risks involved in the project
21 and is necessary to meet the objectives of this title.

22 (c) CALCULATION OF AMOUNT.—In calculating the
23 amount of the non-Federal commitment under subsection
24 (a) or (b), the Secretary may include personnel, services,
25 equipment, and other resources.

1 (d) SIZE OF NON-FEDERAL SHARE.—The Secretary
2 may consider the size of the non-Federal share in selecting
3 projects.

4 **SEC. 973. MERIT REVIEW OF PROPOSALS.**

5 Awards of funds authorized under this title shall be
6 made only after an impartial review of the scientific and
7 technical merit of the proposals for such awards has been
8 carried out by or for the Department.

9 **SEC. 974. EXTERNAL TECHNICAL REVIEW OF DEPART-**
10 **MENTAL PROGRAMS.**

11 (a) NATIONAL ENERGY RESEARCH AND DEVELOP-
12 MENT ADVISORY BOARDS.—

13 (1) IN GENERAL.—The Secretary shall establish
14 1 or more advisory boards to review Department re-
15 search, development, demonstration, and commercial
16 application programs in energy efficiency, renewable
17 energy, nuclear energy, and fossil energy.

18 (2) EXISTING ADVISORY BOARDS.—The Sec-
19 retary may designate an existing advisory board
20 within the Department to fulfill the responsibilities
21 of an advisory board under this subsection, and may
22 enter into appropriate arrangements with the Na-
23 tional Academy of Sciences to establish such an ad-
24 visory board.

25 (b) OFFICE OF SCIENCE ADVISORY COMMITTEES.—

1 (1) UTILIZATION OF EXISTING COMMITTEES.—

2 The Secretary shall continue to use the scientific
3 program advisory committees chartered under the
4 Federal Advisory Committee Act (5 U.S.C. App.) by
5 the Office of Science to oversee research and devel-
6 opment programs under that Office.

7 (2) SCIENCE ADVISORY COMMITTEE.—

8 (A) ESTABLISHMENT.—There shall be in
9 the Office of Science a Science Advisory Com-
10 mittee that includes the chairs of each of the
11 advisory committees described in paragraph (1).

12 (B) RESPONSIBILITIES.—The Science Ad-
13 visory Committee shall—

14 (i) serve as the science advisor to the
15 Director of the Office of Science;

16 (ii) advise the Director with respect to
17 the well-being and management of the Na-
18 tional Laboratories and single-purpose re-
19 search facilities;

20 (iii) advise the Director with respect
21 to education and workforce training activi-
22 ties required for effective short-term and
23 long-term basic and applied research ac-
24 tivities of the Office of Science; and

1 (iv) advise the Director with respect
2 to the well being of the university research
3 programs supported by the Office of
4 Science.

5 (c) MEMBERSHIP.—Each advisory board under this
6 section shall consist of persons with appropriate expertise
7 representing a diverse range of interests.

8 (d) MEETINGS AND PURPOSES.—Each advisory
9 board under this section shall meet at least semiannually
10 to review and advise on the progress made by the respec-
11 tive research, development, demonstration, and commer-
12 cial application program or programs. The advisory board
13 shall also review the measurable cost and performance-
14 based goals for such programs as established under sec-
15 tion 901(b), and the progress on meeting such goals.

16 (e) PERIODIC REVIEWS AND ASSESSMENTS.—The
17 Secretary shall enter into appropriate arrangements with
18 the National Academy of Sciences to conduct periodic re-
19 views and assessments of the programs authorized by this
20 title, the measurable cost and performance-based goals for
21 such programs as established under section 901(b), if any,
22 and the progress on meeting such goals. Such reviews and
23 assessments shall be conducted every 5 years, or more
24 often as the Secretary considers necessary, and the Sec-

1 retary shall transmit to Congress reports containing the
2 results of all such reviews and assessments.

3 **SEC. 975. IMPROVED COORDINATION OF TECHNOLOGY**
4 **TRANSFER ACTIVITIES.**

5 (a) **TECHNOLOGY TRANSFER COORDINATOR.**—The
6 Secretary shall designate a Technology Transfer Coordi-
7 nator to perform oversight of and policy development for
8 technology transfer activities at the Department. The
9 Technology Transfer Coordinator shall—

10 (1) coordinate the activities of the Technology
11 Transfer Working Group;

12 (2) oversee the expenditure of funds allocated
13 to the Technology Transfer Working Group; and

14 (3) coordinate with each technology partnership
15 ombudsman appointed under section 11 of the Tech-
16 nology Transfer Commercialization Act of 2000 (42
17 U.S.C. 7261c).

18 (b) **TECHNOLOGY TRANSFER WORKING GROUP.**—
19 The Secretary shall establish a Technology Transfer
20 Working Group, which shall consist of representatives of
21 the National Laboratories and single-purpose research fa-
22 cilities, to—

23 (1) coordinate technology transfer activities oc-
24 ccurring at National Laboratories and single-purpose
25 research facilities;

1 (2) exchange information about technology
2 transfer practices, including alternative approaches
3 to resolution of disputes involving intellectual prop-
4 erty rights and other technology transfer matters;
5 and

6 (3) develop and disseminate to the public and
7 prospective technology partners information about
8 opportunities and procedures for technology transfer
9 with the Department, including those related to al-
10 ternative approaches to resolution of disputes involv-
11 ing intellectual property rights and other technology
12 transfer matters.

13 (c) **TECHNOLOGY TRANSFER RESPONSIBILITY.**—
14 Nothing in this section shall affect the technology transfer
15 responsibilities of Federal employees under the Stevenson-
16 Wydler Technology Innovation Act of 1980 (15 U.S.C.
17 3701 et seq.).

18 **SEC. 976. FEDERAL LABORATORY EDUCATIONAL PART-**
19 **NERS.**

20 (a) **DISTRIBUTION OF ROYALTIES RECEIVED BY**
21 **FEDERAL AGENCIES.**—Section 14(a)(1)(B)(v) of the Ste-
22 venson-Wydler Technology Innovation Act of 1980 (15
23 U.S.C. 3710c(a)(1)(B)(v)), is amended to read as follows:

24 “(v) for scientific research and develop-
25 ment and for educational assistance and other

1 purposes consistent with the missions and ob-
2 jectives of the agency and the laboratory.”.

3 (b) COOPERATIVE RESEARCH AND DEVELOPMENT
4 AGREEMENTS.—Section 12(b)(5)(C) of the Stevenson-
5 Wydler Technology Innovation Act of 1980 (15 U.S.C.
6 3710a(b)(5)(C)) is amended to read as follows:

7 “(C) for scientific research and development
8 and for educational assistance consistent with the
9 missions and objectives of the agency and the lab-
10 oratory.”.

11 **SEC. 977. INTERAGENCY COOPERATION.**

12 The Secretary shall enter into discussions with the
13 Administrator of the National Aeronautics and Space Ad-
14 ministration with the goal of reaching an interagency
15 working agreement between the 2 agencies that would
16 make the National Aeronautics and Space Administra-
17 tion’s expertise in energy, gained from its existing and
18 planned programs, more readily available to the relevant
19 research, development, demonstration, and commercial ap-
20 plications programs of the Department. Technologies to
21 be discussed should include the National Aeronautics and
22 Space Administration’s modeling, research, development,
23 testing, and evaluation of new energy technologies, includ-
24 ing solar, wind, fuel cells, and hydrogen storage and dis-
25 tribution.

1 **SEC. 978. TECHNOLOGY INFRASTRUCTURE PROGRAM.**

2 (a) ESTABLISHMENT.—The Secretary shall establish
3 a Technology Infrastructure Program in accordance with
4 this section.

5 (b) PURPOSE.—The purpose of the Technology Infra-
6 structure Program shall be to improve the ability of Na-
7 tional Laboratories and single-purpose research facilities
8 to support departmental missions by—

9 (1) stimulating the development of technology
10 clusters that can support departmental missions at
11 the National Laboratories or single-purpose research
12 facilities;

13 (2) improving the ability of National Labora-
14 tories and single-purpose research facilities to lever-
15 age and benefit from commercial research, tech-
16 nology, products, processes, and services; and

17 (3) encouraging the exchange of scientific and
18 technological expertise between National Labora-
19 tories or single-purpose research facilities and enti-
20 ties that can support departmental missions at the
21 National Laboratories or single-purpose research fa-
22 cilities, such as institutions of higher education;
23 technology-related business concerns; nonprofit insti-
24 tutions; and agencies of State, tribal, or local gov-
25 ernments.

1 (c) PROJECTS.—The Secretary shall authorize the
2 Director of each National Laboratory or single-purpose re-
3 search facility to implement the Technology Infrastructure
4 Program at such National Laboratory or facility through
5 projects that meet the requirements of subsections (d) and
6 (e).

7 (d) PROGRAM REQUIREMENTS.—Each project funded
8 under this section shall meet the following requirements:

9 (1) Each project shall include at least 1 of each
10 of the following entities: a business; an institution of
11 higher education; a nonprofit institution; and an
12 agency of a State, local, or tribal government.

13 (2) Not less than 50 percent of the costs of
14 each project funded under this section shall be pro-
15 vided from non-Federal sources. The calculation of
16 costs paid by the non-Federal sources to a project
17 shall include cash, personnel, services, equipment,
18 and other resources expended on the project after
19 start of the project. Independent research and devel-
20 opment expenses of Government contractors that
21 qualify for reimbursement under section 31.205–
22 18(e) of the Federal Acquisition Regulation issued
23 pursuant to section 25(c)(1) of the Office of Federal
24 Procurement Policy Act (41 U.S.C. 421(c)(1)) may
25 be credited toward costs paid by non-Federal sources

1 to a project, if the expenses meet the other require-
2 ments of this section.

3 (3) All projects under this section shall be com-
4 petitively selected using procedures determined by
5 the Secretary.

6 (4) Any participant that receives funds under
7 this section may use generally accepted accounting
8 principles for maintaining accounts, books, and
9 records relating to the project.

10 (5) No Federal funds shall be made available
11 under this section for construction or any project for
12 more than 5 years.

13 (e) SELECTION CRITERIA.—

14 (1) IN GENERAL.—The Secretary shall allocate
15 funds under this section only if the Director of the
16 National Laboratory or single-purpose research facil-
17 ity managing the project determines that the project
18 is likely to improve the ability of the National Lab-
19 oratory or single-purpose research facility to achieve
20 technical success in meeting departmental missions.

21 (2) CRITERIA.—The Secretary shall consider
22 the following criteria in selecting a project to receive
23 Federal funds:

24 (A) The potential of the project to promote
25 the development of a commercially sustainable

1 technology cluster following the period of De-
2 partment investment, which will derive most of
3 the demand for its products or services from
4 the private sector, and which will support de-
5 partmental missions at the participating Na-
6 tional Laboratory or single-purpose research fa-
7 cility.

8 (B) The potential of the project to promote
9 the use of commercial research, technology,
10 products, processes, and services by the partici-
11 pating National Laboratory or single-purpose
12 research facility to achieve its mission or the
13 commercial development of technological inno-
14 vations made at the participating National Lab-
15 oratory or single-purpose research facility.

16 (C) The extent to which the project in-
17 volves a wide variety and number of institutions
18 of higher education, nonprofit institutions, and
19 technology-related business concerns that can
20 support the missions of the participating Na-
21 tional Laboratory or single-purpose research fa-
22 cility and that will make substantive contribu-
23 tions to achieving the goals of the project.

24 (D) The extent to which the project fo-
25 cuses on promoting the development of tech-

1 nology-related business concerns that are small
2 businesses or involves such small businesses
3 substantively in the project.

4 (E) Such other criteria as the Secretary
5 determines to be appropriate.

6 (f) ALLOCATION.—In allocating funds for projects
7 approved under this section, the Secretary shall provide—

8 (1) the Federal share of the project costs; and

9 (2) additional funds to the National Laboratory
10 or single-purpose research facility managing the
11 project to permit the National Laboratory or single-
12 purpose research facility to carry out activities relat-
13 ing to the project, and to coordinate such activities
14 with the project.

15 (g) REPORT TO CONGRESS.—Not later than July 1,
16 2006, the Secretary shall report to Congress on whether
17 the Technology Infrastructure Program should be contin-
18 ued and, if so, how the program should be managed.

19 (h) DEFINITIONS.—In this section:

20 (1) TECHNOLOGY CLUSTER.—The term “tech-
21 nology cluster” means a concentration of technology-
22 related business concerns, institutions of higher edu-
23 cation, or nonprofit institutions that reinforce each
24 other’s performance in the areas of technology devel-
25 opment through formal or informal relationships.

1 (2) TECHNOLOGY-RELATED BUSINESS CON-
2 CERN.—The term “technology-related business con-
3 cern” means a for-profit corporation, company, asso-
4 ciation, firm, partnership, or small business concern
5 that conducts scientific or engineering research; de-
6 velops new technologies; manufactures products
7 based on new technologies; or performs technological
8 services.

9 (i) AUTHORIZATION OF APPROPRIATIONS.—There
10 are authorized to be appropriated to the Secretary for ac-
11 tivities under this section \$10,000,000 for each of fiscal
12 years 2004, 2005, and 2006.

13 **SEC. 979. REPROGRAMMING.**

14 (a) DISTRIBUTION REPORT.—Not later than 60 days
15 after the date of the enactment of an Act appropriating
16 amounts authorized under this title, the Secretary shall
17 transmit to the appropriate authorizing committees of
18 Congress a report explaining how such amounts will be
19 distributed among the authorizations contained in this
20 title.

21 (b) PROHIBITION.—

22 (1) IN GENERAL.—No amount identified under
23 subsection (a) shall be reprogrammed if such re-
24 programming would result in an obligation which
25 changes an individual distribution required to be re-

1 ported under subsection (a) by more than 5 percent
2 unless the Secretary has transmitted to the appro-
3 priate authorizing committees of Congress a report
4 described in subsection (c) and a period of 30 days
5 has elapsed after such committees receive the report.

6 (2) COMPUTATION.—In the computation of the
7 30-day period described in paragraph (1), there shall
8 be excluded any day on which either House of Con-
9 gress is not in session because of an adjournment of
10 more than 3 days to a day certain.

11 (c) REPROGRAMMING REPORT.—A report referred to
12 in subsection (b)(1) shall contain a full and complete
13 statement of the action proposed to be taken and the facts
14 and circumstances relied on in support of the proposed
15 action.

16 **SEC. 980. CONSTRUCTION WITH OTHER LAWS.**

17 Except as otherwise provided in this title, the Sec-
18 retary shall carry out the research, development, dem-
19 onstration, and commercial application programs,
20 projects, and activities authorized by this title in accord-
21 ance with the applicable provisions of the Atomic Energy
22 Act of 1954 (42 U.S.C. 2011 et seq.), the Federal Non-
23 nuclear Research and Development Act of 1974 (42
24 U.S.C. 5901 et seq.), the Energy Policy Act of 1992 (42
25 U.S.C. 13201 et seq.), the Stevenson-Wydler Technology

1 Innovation Act of 1980 (15 U.S.C. 3701 et seq.), chapter
2 18 of title 35, United States Code (commonly referred to
3 as the Bayh-Dole Act), and any other Act under which
4 the Secretary is authorized to carry out such activities.

5 **SEC. 981. REPORT ON RESEARCH AND DEVELOPMENT PRO-**
6 **GRAM EVALUATION METHODOLOGIES.**

7 Not later than 180 days after the date of enactment
8 of this Act, the Secretary shall enter into appropriate ar-
9 rangements with the National Academy of Sciences to in-
10 vestigate and report on the scientific and technical merits
11 of any evaluation methodology currently in use or pro-
12 posed for use in relation to the scientific and technical pro-
13 grams of the Department by the Secretary or other Fed-
14 eral official. Not later than 6 months after receiving the
15 report of the National Academy, the Secretary shall sub-
16 mit such report to Congress, along with any other views
17 or plans of the Secretary with respect to the future use
18 of such evaluation methodology.

19 **SEC. 982. DEPARTMENT OF ENERGY SCIENCE AND TECH-**
20 **NOLOGY SCHOLARSHIP PROGRAM.**

21 (a) ESTABLISHMENT OF PROGRAM.—

22 (1) IN GENERAL.—The Secretary is authorized
23 to establish a Department of Energy Science and
24 Technology Scholarship Program to award scholar-

1 ships to individuals that is designed to recruit and
2 prepare students for careers in the Department.

3 (2) COMPETITIVE PROCESS.—Individuals shall
4 be selected to receive scholarships under this section
5 through a competitive process primarily on the basis
6 of academic merit, with consideration given to finan-
7 cial need and the goal of promoting the participation
8 of individuals identified in section 33 or 34 of the
9 Science and Engineering Equal Opportunities Act
10 (42 U.S.C. 1885a or 1885b).

11 (3) SERVICE AGREEMENTS.—To carry out the
12 Program the Secretary shall enter into contractual
13 agreements with individuals selected under para-
14 graph (2) under which the individuals agree to serve
15 as full-time employees of the Department, for the
16 period described in subsection (f)(1), in positions
17 needed by the Department and for which the individ-
18 uals are qualified, in exchange for receiving a schol-
19 arship.

20 (b) SCHOLARSHIP ELIGIBILITY.—In order to be eligi-
21 ble to participate in the Program, an individual must—

22 (1) be enrolled or accepted for enrollment as a
23 full-time student at an institution of higher edu-
24 cation in an academic program or field of study de-

1 scribed in the list made available under subsection
2 (d);

3 (2) be a United States citizen; and

4 (3) at the time of the initial scholarship award,
5 not be a Federal employee as defined in section
6 2105 of title 5 of the United States Code.

7 (c) APPLICATION REQUIRED.—An individual seeking
8 a scholarship under this section shall submit an applica-
9 tion to the Secretary at such time, in such manner, and
10 containing such information, agreements, or assurances as
11 the Secretary may require.

12 (d) ELIGIBLE ACADEMIC PROGRAMS.—The Secretary
13 shall make publicly available a list of academic programs
14 and fields of study for which scholarships under the Pro-
15 gram may be utilized, and shall update the list as nec-
16 essary.

17 (e) SCHOLARSHIP REQUIREMENT.—

18 (1) IN GENERAL.—The Secretary may provide a
19 scholarship under the Program for an academic year
20 if the individual applying for the scholarship has
21 submitted to the Secretary, as part of the applica-
22 tion required under subsection (c), a proposed aca-
23 demic program leading to a degree in a program or
24 field of study on the list made available under sub-
25 section (d).

1 (2) DURATION OF ELIGIBILITY.—An individual
2 may not receive a scholarship under this section for
3 more than 4 academic years, unless the Secretary
4 grants a waiver.

5 (3) SCHOLARSHIP AMOUNT.—The dollar
6 amount of a scholarship under this section for an
7 academic year shall be determined under regulations
8 issued by the Secretary, but shall in no case exceed
9 the cost of attendance.

10 (4) AUTHORIZED USES.—A scholarship pro-
11 vided under this section may be expended for tuition,
12 fees, and other authorized expenses as established by
13 the Secretary by regulation.

14 (5) CONTRACTS REGARDING DIRECT PAYMENTS
15 TO INSTITUTIONS.—The Secretary may enter into a
16 contractual agreement with an institution of higher
17 education under which the amounts provided for a
18 scholarship under this section for tuition, fees, and
19 other authorized expenses are paid directly to the in-
20 stitution with respect to which the scholarship is
21 provided.

22 (f) PERIOD OF OBLIGATED SERVICE.—

23 (1) DURATION OF SERVICE.—The period of
24 service for which an individual shall be obligated to
25 serve as an employee of the Department is, except

1 as provided in subsection (h)(2), 24 months for each
2 academic year for which a scholarship under this
3 section is provided.

4 (2) SCHEDULE FOR SERVICE.—

5 (A) IN GENERAL.—Except as provided in
6 subparagraph (B), obligated service under para-
7 graph (1) shall begin not later than 60 days
8 after the individual obtains the educational de-
9 gree for which the scholarship was provided.

10 (B) DEFERRAL.—The Secretary may defer
11 the obligation of an individual to provide a pe-
12 riod of service under paragraph (1) if the Sec-
13 retary determines that such a deferral is appro-
14 priate. The Secretary shall prescribe the terms
15 and conditions under which a service obligation
16 may be deferred through regulation.

17 (g) PENALTIES FOR BREACH OF SCHOLARSHIP
18 AGREEMENT.—

19 (1) FAILURE TO COMPLETE ACADEMIC TRAIN-
20 ING.—Scholarship recipients who fail to maintain a
21 high level of academic standing, as defined by the
22 Secretary by regulation, who are dismissed from
23 their educational institutions for disciplinary rea-
24 sons, or who voluntarily terminate academic training
25 before graduation from the educational program for

1 which the scholarship was awarded, shall be in
2 breach of their contractual agreement and, in lieu of
3 any service obligation arising under such agreement,
4 shall be liable to the United States for repayment
5 not later than 1 year after the date of default of all
6 scholarship funds paid to them and to the institution
7 of higher education on their behalf under the agree-
8 ment, except as provided in subsection (h)(2). The
9 repayment period may be extended by the Secretary
10 when determined to be necessary, as established by
11 regulation.

12 (2) FAILURE TO BEGIN OR COMPLETE THE
13 SERVICE OBLIGATION OR MEET THE TERMS AND
14 CONDITIONS OF DEFERMENT.—A scholarship recipi-
15 ent who, for any reason, fails to begin or complete
16 a service obligation under this section after comple-
17 tion of academic training, or fails to comply with the
18 terms and conditions of deferment established by the
19 Secretary pursuant to subsection (f)(2)(B), shall be
20 in breach of the contractual agreement. When a re-
21 cipient breaches an agreement for the reasons stated
22 in the preceding sentence, the recipient shall be lia-
23 ble to the United States for an amount equal to—

1 (A) the total amount of scholarships re-
2 ceived by such individual under this section;
3 plus

4 (B) the interest on the amounts of such
5 awards which would be payable if at the time
6 the awards were received they were loans bear-
7 ing interest at the maximum legal prevailing
8 rate, as determined by the Treasurer of the
9 United States,

10 multiplied by 3.

11 (h) WAIVER OR SUSPENSION OF OBLIGATION.—

12 (1) DEATH OF INDIVIDUAL.—Any obligation of
13 an individual incurred under the Program (or a con-
14 tractual agreement thereunder) for service or pay-
15 ment shall be canceled upon the death of the indi-
16 vidual.

17 (2) IMPOSSIBILITY OR EXTREME HARDSHIP.—

18 The Secretary shall by regulation provide for the
19 partial or total waiver or suspension of any obliga-
20 tion of service or payment incurred by an individual
21 under the Program (or a contractual agreement
22 thereunder) whenever compliance by the individual is
23 impossible or would involve extreme hardship to the
24 individual, or if enforcement of such obligation with

1 respect to the individual would be contrary to the
2 best interests of the Government.

3 (i) DEFINITIONS.—In this section the following defi-
4 nitions apply:

5 (1) COST OF ATTENDANCE.—The term “cost of
6 attendance” has the meaning given that term in sec-
7 tion 472 of the Higher Education Act of 1965 (20
8 U.S.C. 1087*ll*).

9 (2) PROGRAM.—The term “Program” means
10 the Department of Energy Science and Technology
11 Scholarship Program established under this section.

12 (j) AUTHORIZATION OF APPROPRIATIONS.—There
13 are authorized to be appropriated to the Secretary for ac-
14 tivities under this section—

15 (1) for fiscal year 2004, \$800,000;

16 (2) for fiscal year 2005, \$1,600,000;

17 (3) for fiscal year 2006, \$2,000,000;

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

19 (5) for fiscal year 2008, \$2,000,000.

20 **SEC. 983. REPORT ON EQUAL EMPLOYMENT OPPORTUNITY**
21 **PRACTICES.**

22 Not later than 12 months after the date of enactment
23 of this Act, and biennially thereafter, the Secretary shall
24 transmit to Congress a report on the equal employment

1 opportunity practices at National Laboratories. Such re-
2 port shall include—

3 (1) a thorough review of each laboratory con-
4 tractor's equal employment opportunity policies, in-
5 cluding promotion to management and professional
6 positions and pay raises;

7 (2) a statistical report on complaints and their
8 disposition in the laboratories;

9 (3) a description of how equal employment op-
10 portunity practices at the laboratories are treated in
11 the contract and in calculating award fees for each
12 contractor;

13 (4) a summary of disciplinary actions and their
14 disposition by either the Department or the relevant
15 contractors for each laboratory;

16 (5) a summary of outreach efforts to attract
17 women and minorities to the laboratories;

18 (6) a summary of efforts to retain women and
19 minorities in the laboratories; and

20 (7) a summary of collaboration efforts with the
21 Office of Federal Contract Compliance Programs to
22 improve equal employment opportunity practices at
23 the laboratories.

1 **SEC. 984. SMALL BUSINESS ADVOCACY AND ASSISTANCE.**

2 (a) SMALL BUSINESS ADVOCATE.—The Secretary
3 shall require the Director of each National Laboratory,
4 and may require the Director of a single-purpose research
5 facility, to designate a small business advocate to—

6 (1) increase the participation of small business
7 concerns, including socially and economically dis-
8 advantaged small business concerns, in procurement,
9 collaborative research, technology licensing, and
10 technology transfer activities conducted by the Na-
11 tional Laboratory or single-purpose research facility;

12 (2) report to the Director of the National Lab-
13 oratory or single-purpose research facility on the ac-
14 tual participation of small business concerns, includ-
15 ing socially and economically disadvantaged small
16 business concerns, in procurement, collaborative re-
17 search, technology licensing, and technology transfer
18 activities along with recommendations, if appro-
19 priate, on how to improve participation;

20 (3) make available to small businesses training,
21 mentoring, and information on how to participate in
22 procurement and collaborative research activities;

23 (4) increase the awareness inside the National
24 Laboratory or single-purpose research facility of the
25 capabilities and opportunities presented by small
26 business concerns; and

1 (5) establish guidelines for the program under
2 subsection (b) and report on the effectiveness of
3 such program to the Director of the National Lab-
4 oratory or single-purpose research facility.

5 (b) ESTABLISHMENT OF SMALL BUSINESS ASSIST-
6 ANCE PROGRAM.—The Secretary shall require the Direc-
7 tor of each National Laboratory, and may require the Di-
8 rector of a single-purpose research facility, to establish a
9 program to provide small business concerns—

10 (1) assistance directed at making them more ef-
11 fective and efficient subcontractors or suppliers to
12 the National Laboratory or single-purpose research
13 facility; or

14 (2) general technical assistance, the cost of
15 which shall not exceed \$10,000 per instance of as-
16 sistance, to improve the small business concerns’
17 products or services.

18 (c) USE OF FUNDS.—None of the funds expended
19 under subsection (b) may be used for direct grants to the
20 small business concerns.

21 (d) DEFINITIONS.—In this section:

22 (1) SMALL BUSINESS CONCERN.—The term
23 “small business concern” has the meaning given
24 such term in section 3 of the Small Business Act
25 (15 U.S.C. 632).

1 with the National Academy of Sciences for the Academy
2 to—

3 (1) conduct a study on—

4 (A) the obstacles to accelerating the com-
5 mercial application of energy technology; and

6 (B) the adequacy of Department policies
7 and procedures for, and oversight of, technology
8 transfer-related disputes between contractors of
9 the Department and the private sector; and

10 (2) transmit a report to Congress on rec-
11 ommendations developed as a result of the study.

12 **SEC. 987. OUTREACH.**

13 The Secretary shall ensure that each program au-
14 thorized by this title includes an outreach component to
15 provide information, as appropriate, to manufacturers,
16 consumers, engineers, architects, builders, energy service
17 companies, institutions of higher education, small busi-
18 nesses, facility planners and managers, State and local
19 governments, and other entities.

20 **SEC. 988. COMPETITIVE AWARD OF MANAGEMENT CON-**
21 **TRACTS.**

22 None of the funds authorized to be appropriated to
23 the Secretary by this title may be used to award a manage-
24 ment and operating contract for a nonmilitary energy lab-
25 oratory of the Department unless such contract is com-

1 petitively awarded or the Secretary grants, on a case-by-
2 case basis, a waiver to allow for such a deviation. The Sec-
3 retary may not delegate the authority to grant such a
4 waiver and shall submit to Congress a report notifying
5 Congress of the waiver and setting forth the reasons for
6 the waiver at least 60 days prior to the date of the award
7 of such a contract.

8 **SEC. 989. EDUCATIONAL PROGRAMS IN SCIENCE AND**
9 **MATHEMATICS.**

10 (a) **ACTIVITIES.**—Section 3165(a) of the Department
11 of Energy Science Education Enhancement Act (42
12 U.S.C. 7381b(a)) is amended by adding at the end the
13 following:

14 “(14) Support competitive events for students,
15 under supervision of teachers, designed to encourage
16 student interest and knowledge in science and math-
17 ematics.”.

18 (b) **AUTHORIZATION OF APPROPRIATIONS.**—Section
19 3169 of the Department of Energy Science Education En-
20 hancement Act (42 U.S.C. 7381e), as so redesignated by
21 section 1102(b), is amended by inserting before the period
22 “; and \$40,000,000 for each of fiscal years 2004 through
23 2008”.