

tee, shall develop a plan for the participation of United States scientists in the ITER that shall include—

- (i) the United States research agenda for the ITER;
- (ii) methods to evaluate whether the ITER is promoting progress toward making fusion a reliable and affordable source of power; and
- (iii) a description of how work at the ITER will relate to other elements of the United States fusion program.

(B) Review

The Secretary shall request a review of the plan by the National Academy of Sciences.

(5) Limitation

No Federal funds shall be expended for the construction of the ITER until the Secretary has submitted to Congress—

- (A) the agreement negotiated in accordance with paragraph (3) and 120 days have elapsed since that submission;
- (B) a report describing the management structure of the ITER and providing a fixed dollar estimate of the cost of United States participation in the construction of the ITER, and 120 days have elapsed since that submission;
- (C) a report describing how United States participation in the ITER will be funded without reducing funding for other programs in the Office of Science (including other fusion programs), and 60 days have elapsed since that submission; and
- (D) the plan required by paragraph (4) (but not the National Academy of Sciences review of that plan), and 60 days have elapsed since that submission.

(6) Alternative to ITER

(A) In general

If at any time during the negotiations on the ITER, the Secretary determines that construction and operation of the ITER is unlikely or infeasible, the Secretary shall submit to Congress, along with the budget request of the President submitted to Congress for the following fiscal year, a plan for implementing a domestic burning plasma experiment such as the Fusion Ignition Research Experiment, including costs and schedules for the plan.

(B) Administration

The Secretary shall—

- (i) refine the plan in full consultation with the Fusion Energy Sciences Advisory Committee; and
- (ii) transmit the plan to the National Academy of Sciences for review.

(Pub. L. 109-58, title IX, §972, Aug. 8, 2005, 119 Stat. 899.)

§ 16313. Catalysis research program

(a) Establishment

The Secretary, acting through the Office of Science, shall support a program of research and development in catalysis science consistent with the statutory authorities of the Department related to research and development.

(b) Components

The program shall include efforts to—

- (1) enable catalyst design using combinations of experimental and mechanistic methodologies coupled with computational modeling of catalytic reactions at the molecular level;
- (2) develop techniques for high throughput synthesis, assay, and characterization at nanometer and subnanometer scales in-situ under actual operating conditions;
- (3) synthesize catalysts with specific site architectures;
- (4) conduct research on the use of precious metals for catalysis; and
- (5) translate molecular understanding to the design of catalytic compounds.

(c) Duties of the Office of Science

In carrying out the program, the Director of the Office of Science shall—

- (1) support both individual investigators and multidisciplinary teams of investigators to pioneer new approaches in catalytic design;
- (2) develop, plan, construct, acquire, share, or operate special equipment or facilities for the use of investigators in collaboration with national user facilities, such as nanoscience and engineering centers;
- (3) support technology transfer activities to benefit industry and other users of catalysis science and engineering; and
- (4) coordinate research and development activities with industry and other Federal agencies.

(d) Assessment

Not later than 3 years after August 8, 2005, the Secretary shall enter into an arrangement with the National Academy of Sciences to—

- (1) review the catalysis program to measure—
 - (A) gains made in the fundamental science of catalysis; and
 - (B) progress towards developing new fuels for energy production and material fabrication processes; and
- (2) submit to Congress a report describing the results of the review.

(Pub. L. 109-58, title IX, §973, Aug. 8, 2005, 119 Stat. 902.)

§ 16314. Hydrogen

(a) In general

The Secretary shall conduct a program of fundamental research and development in support of programs authorized under subchapter VIII.

(b) Methods

The program shall include support for methods of generating hydrogen without the use of natural gas.

(Pub. L. 109-58, title IX, §974, Aug. 8, 2005, 119 Stat. 903.)

§ 16315. Solid state lighting

The Secretary shall conduct a program of fundamental research on solid state lighting in support of the Next Generation Lighting Initiative carried out under section 16192 of this title.

(Pub. L. 109–58, title IX, §975, Aug. 8, 2005, 119 Stat. 903.)

§ 16316. Advanced scientific computing research and development program

(1) In general

The Secretary shall conduct an advanced scientific computing research and development program that includes activities related to applied mathematics and activities authorized by the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541 et seq.).

(2) Goal

The Secretary shall carry out the program with the goal of supporting departmental missions, and providing the high-performance computational, networking, advanced visualization technologies, and workforce resources, that are required for world leadership in science.

(Pub. L. 109–58, title IX, §976(a), Aug. 8, 2005, 119 Stat. 903.)

REFERENCES IN TEXT

The Department of Energy High-End Computing Revitalization Act of 2004, referred to in par. (1), is Pub. L. 108–423, Nov. 30, 2004, 118 Stat. 2400, which is classified principally to subchapter III (§5541 et seq.) of chapter 81 of Title 15, Commerce and Trade. For complete classification of this Act to the Code, see Short Title note set out under section 5501 of Title 15 and Tables.

§ 16317. Systems biology program

(a) Program

(1) Establishment

The Secretary shall establish a research, development, and demonstration program in microbial and plant systems biology, protein science, computational biology, and environmental science to support the energy, national security, and environmental missions of the Department.

(2) Grants

The program shall support individual researchers and multidisciplinary teams of researchers through competitive, merit-reviewed grants.

(3) Consultation

In carrying out the program, the Secretary shall consult with other Federal agencies that conduct genetic and protein research.

(b) Goals

The program shall have the goal of developing technologies and methods based on the biological functions of genomes, microbes, and plants that—

- (1) can facilitate the production of fuels, including hydrogen in sustainable production systems that reduce greenhouse gas emissions;
- (2) convert carbon dioxide to organic carbon;
- (3) detoxify soils and water, including at facilities of the Department, contaminated with heavy metals and radiological materials;
- (4) develop cellulosic and other feedstocks that are less resource and land intensive and that promote sustainable use of resources, including soil, water, energy, forests, and land, and ensure protection of air, water, and soil quality; and

(5) address other Department missions as identified by the Secretary.

(c) Plan

(1) Development of plan

Not later than 1 year after August 8, 2005, the Secretary shall prepare and transmit to Congress a research plan describing how the program authorized pursuant to this section will be undertaken to accomplish the program goals established in subsection (b).

(2) Review of plan

The Secretary shall contract with the National Academy of Sciences to review the research plan developed under this subsection. The Secretary shall transmit the review to Congress not later than 18 months after transmittal of the research plan under paragraph (1), along with the Secretary's response to the recommendations contained in the review.

(d) User facilities and ancillary equipment

Within the funds authorized to be appropriated pursuant to this part, amounts shall be available for projects to develop, plan, construct, acquire, or operate special equipment, instrumentation, or facilities, including user facilities at National Laboratories, for researchers conducting research, development, demonstration, and commercial application in systems biology and proteomics and associated biological disciplines.

(e) Prohibition on biomedical and human cell and human subject research

(1) No biomedical research

In carrying out the program under this section, the Secretary shall not conduct biomedical research.

(2) Limitations

Nothing in this section shall authorize the Secretary to conduct any research or demonstrations—

- (A) on human cells or human subjects; or
- (B) designed to have direct application with respect to human cells or human subjects.

(f) Bioenergy research centers

(1) Establishment of centers

In carrying out the program under subsection (a), the Secretary shall establish at least 7 bioenergy research centers, which may be of varying size.

(2) Geographic distribution

The Secretary shall establish at least 1 bioenergy research center in each Petroleum Administration for Defense District or Subdistrict of a Petroleum Administration for Defense District.

(3) Goals

The goals of the centers established under this subsection shall be to accelerate basic transformational research and development of biofuels, including biological processes.

(4) Selection and duration

(A) In general

A center under this subsection shall be selected on a competitive basis for a period of 5 years.