To authorize the Secretary of Energy to cooperate in the international magnetic fusion burning plasma experiment, or alternatively to develop a plan for a domestic burning plasma experiment, for the purpose of accelerating the scientific understanding and development of fusion as a long term energy source.

IN THE SENATE OF THE UNITED STATES

MARCH 11, 2003

Mr. Craig (for himself and Mrs. Feinstein) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

A BILL

To authorize the Secretary of Energy to cooperate in the international magnetic fusion burning plasma experiment, or alternatively to develop a plan for a domestic burning plasma experiment, for the purpose of accelerating the scientific understanding and development of fusion as a long term energy source.

1 Be it enacted by the Senate and House of Representa-
2 tives of the United States of America in Congress assembled,
3 SECTION 1. SHORT TITLE.
4 This Act may be cited as the “Fusion Development
5 Act of 2003”.

S. 600
SEC. 2. FINDINGS.

The Congress finds the following:

(1) Economic prosperity is closely linked to an affordable and ample energy supply.

(2) Environmental quality is closely linked to energy production and use.

(3) Population, worldwide economic development, energy consumption, and stress on the environment are all expected to increase substantially in the coming decades.

(4) The few energy options with the potential to meet economic and environmental needs for the long-term future should be pursued aggressively now, as part of a balanced national energy plan.

(5) Fusion energy is an attractive long-term energy source due to a virtually inexhaustible supply of fuel available to all nations, its potential as a large base-load electric and hydrogen energy source requiring relatively little land mass, and its inherent safety and promise of minimal environmental impact.

(6) The National Research Council, the President’s Committee of Advisors on Science and Technology, and the Secretary of Energy Advisory Board have each reviewed the Fusion Energy Sciences Program and each strongly supports the fundamental
science and creative innovation of the program and has confirmed that progress toward the goal of producing practical fusion energy has been excellent, although much scientific and engineering work remains to be done.

(7) Each of these reviews have stressed the need for a magnetic fusion burning plasma experiment to address key scientific issues and as a necessary step in the development of fusion energy.

(8) The United States fusion research community has developed a strong consensus that the first option for United States involvement in a burning plasma experiment should be through the international project known as “ITER”, and, that should the ITER experiment fail to go forward, then the construction of a domestic burning plasma experiment known as the Fusion Ignition Research Experiment or “FIRE” should be pursued aggressively.

(9) The United States scientific community has also developed a corresponding consensus that the eventual success of fusion power will require, concurrent with a burning plasma experiment, strengthened effort in fundamental fusion science, development of advanced technology, and innovation and
optimization of configurations for an eventual fusion demonstration facility.

(10) The Fusion Energy Sciences Program budget within the Department of Energy is inadequate to support the necessary science and innovation for the present generation of experiments, and cannot accommodate the cost of participation in or construction of a burning plasma experiment.

**SEC. 3. PLAN FOR FUSION EXPERIMENT.**

(a) IN GENERAL.—

(1) PRIORITY FOR INTERNATIONAL BURNING PLASMA PROJECT.—The Secretary of Energy (in this Act referred to as “the Secretary”) is authorized to undertake full scientific and technological cooperation in the international burning plasma project known as ITER.

(2) ALTERNATIVE PROJECT.—If at any time during the negotiations on the ITER project, the Secretary determines that construction and operation of the ITER project is unlikely or infeasible, the Secretary shall send to Congress, as part of the budget request for the following year, a plan for implementing the domestic burning plasma experiment known as FIRE, including costs and schedules for FIRE. The Secretary shall refine such plan in full
consultation with the Fusion Energy Sciences Advisory Committee and shall also transmit such plan to the National Research Council for review.

(b) UNITED STATES POLICY WITH RESPECT TO FUSION ENERGY SCIENCE.—

(1) DECLARATION OF POLICY.—It shall be the policy of the United States to develop the scientific, engineering, and commercial infrastructure necessary to ensure that the United States is competitive with other nations in providing fusion energy for its own needs and the needs of other nations, including, by demonstrating electric power or hydrogen production for the United States energy grid utilizing fusion energy at the earliest date possible.

(2) FUSION ENERGY PLAN.—Within 6 months of the date of enactment of this Act, the Secretary shall transmit to Congress a plan for carrying out the policy set forth in paragraph (1), including cost estimates, proposed budgets, schedules, potential international partners, and specific programs for implementing such policy.

(A) REQUIREMENTS OF PLAN.—Such plan shall also ensure that—

(i) existing fusion research facilities are more fully utilized;
(ii) fusion science, technology, theory, advanced computation, modeling and simulation are strengthened;

(iii) new magnetic and inertial fusion research facilities are selected based on scientific innovation, cost effectiveness, and their potential to advance the goal of practical fusion energy at the earliest date possible;

(iv) such facilities that are selected are funded at a cost-effective rate;

(v) communication of scientific results and methods between the fusion energy science community and the broader scientific and technology communities is improved;

(vi) inertial confinement fusion facilities are utilized to the extent practicable for the purpose of inertial fusion energy research and development; and

(vii) attractive alternative inertial and magnetic fusion energy approaches are more fully explored.

(B) Report on Fusion Materials and Technology Project.—In addition, the plan
required by this section shall also address the
status of, and to the degree possible, the costs
and schedules for—

(i) the design and implementation of
international or national facilities for the
testing of fusion materials; and

(ii) the design and implementation of
international or national facilities for the
testing and development of key fusion tech-
nologies.

SEC. 4. DEFINITIONS.

As used in this Act, the following definitions apply:

(1) The term “ITER” refers to the inter-
national fusion research project whose design is
complete and whose location and financing are cur-
rently being negotiated between Japan, Europe, the
Russian Federation, Canada, China, and the United
States.

(2) The term “FIRE” refers to the Fusion Ig-
nition Research Experiment, the fusion research ex-
periment for which design work has been supported
by the Department of Energy as a possible alter-
native burning plasma experiment in the event that
the ITER project fails to move forward.
SEC. 5. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated—

(1) for participation in the ITER project (for development of the FIRE project) under section 3(a) of this Act—

(A) $12,000,000 for fiscal year 2004;
(B) $20,000,000 for fiscal year 2005;
(C) $50,000,000 for fiscal year 2006;
(D) $75,000,000 for fiscal year 2007; and
(E) $115,000,000 for fiscal year 2008; and

(2) for the Fusion Energy Sciences Program in addition to the sums under paragraph (1) of this section—

(A) $335,000,000 for fiscal year 2004;
(B) $349,000,000 for fiscal year 2005;
(C) $362,000,000 for fiscal year 2006;
(D) $377,000,000 for fiscal year 2007; and
(E) $393,000,000 for fiscal year 2008.