

108TH CONGRESS
1ST SESSION

S. 600

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”.

1 **SEC. 2. FINDINGS.**

2 The Congress finds the following:

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

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

7 (3) Population, worldwide economic develop-
8 ment, energy consumption, and stress on the envi-
9 ronment are all expected to increase substantially in
10 the coming decades.

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

15 (5) Fusion energy is an attractive long-term en-
16 ergy source due to a virtually inexhaustible supply of
17 fuel available to all nations, its potential as a large
18 base-load electric and hydrogen energy source re-
19 quiring relatively little land mass, and its inherent
20 safety and promise of minimal environmental im-
21 pact.

22 (6) The National Research Council, the Presi-
23 dent's Committee of Advisors on Science and Tech-
24 nology, and the Secretary of Energy Advisory Board
25 have each reviewed the Fusion Energy Sciences Pro-
26 gram and each strongly supports the fundamental

1 science and creative innovation of the program and
2 has confirmed that progress toward the goal of pro-
3 ducing practical fusion energy has been excellent, al-
4 though much scientific and engineering work re-
5 mains to be done.

6 (7) Each of these reviews have stressed the
7 need for a magnetic fusion burning plasma experi-
8 ment to address key scientific issues and as a nec-
9 essary step in the development of fusion energy.

10 (8) The United States fusion research commu-
11 nity has developed a strong consensus that the first
12 option for United States involvement in a burning
13 plasma experiment should be through the inter-
14 national project known as “ITER”, and, that should
15 the ITER experiment fail to go forward, then the
16 construction of a domestic burning plasma experi-
17 ment known as the Fusion Ignition Research Exper-
18 iment or “FIRE” should be pursued aggressively.

19 (9) The United States scientific community has
20 also developed a corresponding consensus that the
21 eventual success of fusion power will require, concu-
22 rrent with a burning plasma experiment, strength-
23 ened effort in fundamental fusion science, develop-
24 ment of advanced technology, and innovation and

1 optimization of configurations for an eventual fusion
2 demonstration facility.

3 (10) The Fusion Energy Sciences Program
4 budget within the Department of Energy is inad-
5 adequate to support the necessary science and innova-
6 tion for the present generation of experiments, and
7 cannot accommodate the cost of participation in or
8 construction of a burning plasma experiment.

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

10 (a) IN GENERAL.—

11 (1) PRIORITY FOR INTERNATIONAL BURNING
12 PLASMA PROJECT.—The Secretary of Energy (in
13 this Act referred to as “the Secretary”) is author-
14 ized to undertake full scientific and technological co-
15 operation in the international burning plasma
16 project known as ITER.

17 (2) ALTERNATIVE PROJECT.— If at any time
18 during the negotiations on the ITER project, the
19 Secretary determines that construction and oper-
20 ation of the ITER project is unlikely or infeasible,
21 the Secretary shall send to Congress, as part of the
22 budget request for the following year, a plan for im-
23 plementing the domestic burning plasma experiment
24 known as FIRE, including costs and schedules for
25 FIRE. The Secretary shall refine such plan in full

1 consultation with the Fusion Energy Sciences Advi-
2 sory Committee and shall also transmit such plan
3 to the National Research Council for review.

4 (b) UNITED STATES POLICY WITH RESPECT TO FU-
5 SION ENERGY SCIENCE.—

6 (1) DECLARATION OF POLICY.—It shall be the
7 policy of the United States to develop the scientific,
8 engineering, and commercial infrastructure nec-
9 essary to ensure that the United States is competi-
10 tive with other nations in providing fusion energy for
11 its own needs and the needs of other nations, includ-
12 ing, by demonstrating electric power or hydrogen
13 production for the United States energy grid uti-
14 lizing fusion energy at the earliest date possible.

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

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

24 (i) existing fusion research facilities
25 are more fully utilized;

1 (ii) fusion science, technology, theory,
2 advanced computation, modeling and sim-
3 ulation are strengthened;

4 (iii) new magnetic and inertial fusion
5 research facilities are selected based on sci-
6 entific innovation, cost effectiveness, and
7 their potential to advance the goal of prac-
8 tical fusion energy at the earliest date pos-
9 sible;

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

12 (v) communication of scientific results
13 and methods between the fusion energy
14 science community and the broader sci-
15 entific and technology communities is im-
16 proved;

17 (vi) inertial confinement fusion facili-
18 ties are utilized to the extent practicable
19 for the purpose of inertial fusion energy re-
20 search and development; and

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

24 (B) REPORT ON FUSION MATERIALS AND
25 TECHNOLOGY PROJECT.—In addition, the plan

1 required by this section shall also address the
2 status of, and to the degree possible, the costs
3 and schedules for—

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

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

11 **SEC. 4. DEFINITIONS.**

12 As used in this Act, the following definitions apply:

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

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

1 **SEC. 5. AUTHORIZATION OF APPROPRIATIONS.**

2 There are authorized to be appropriated—

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

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

7 (B) \$20,000,000 for fiscal year 2005;

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

9 (D) \$75,000,000 for fiscal year 2007; and

10 (E) \$115,000,000 for fiscal year 2008; and

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

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

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

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

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

18 and

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

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