

109TH CONGRESS  
1ST SESSION

# H. R. 1793

To promote fusion energy development in the United States.

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## IN THE HOUSE OF REPRESENTATIVES

APRIL 21, 2005

Ms. ZOE LOFGREN of California (for herself, Mr. CUNNINGHAM, Mr. MCGOVERN, Mr. EHLERS, Mr. HOLT, Mr. BUTTERFIELD, Ms. BALDWIN, and Mr. HONDA) introduced the following bill; which was referred to the Committee on Science

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## A BILL

To promote fusion energy development in the United States.

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 “Fueling the U.S.A.  
5       Through Unlimited Reliable Energy Act of 2005”.

6       **SEC. 2. FINDINGS.**

7       The Congress finds the following:

8               (1) Economic prosperity and national security  
9       are closely linked to an affordable and ample energy  
10      supply.

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

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

7           (4) The few energy options with the potential to  
8           meet economic and environmental needs for the  
9           long-term future should be pursued as part of a bal-  
10          anced national energy plan.

11          (5) Fusion energy is an attractive long-term en-  
12          ergy source due to virtually inexhaustible supply of  
13          fuel, its potential as a substantial energy source re-  
14          quiring relatively little land mass, and its promise of  
15          minimal environmental impact and inherent safety.

16          (6) The National Research Council, the Presi-  
17          dent's Committee of Advisors on Science and Tech-  
18          nology, and the Secretary of Energy Advisory Board  
19          have each recently reviewed the Fusion Energy  
20          Sciences Program and each strongly supports the  
21          fundamental science and creative innovation of the  
22          program and has confirmed that progress toward the  
23          goal of producing practical fusion energy has been  
24          excellent, although much scientific and engineering  
25          work remains to be done.

1           (7) Each of these reviews and United States fu-  
2           sion scientists have stressed the need for a magnetic  
3           fusion burning experiment to address key scientific  
4           issues and as a necessary step in the development of  
5           fusion energy.

6           (8) Further, the United States fusion research  
7           community has developed a strong consensus that  
8           the first option for United States involvement in a  
9           burning plasma experiment should be through the  
10          international experiment known as “ITER” and  
11          that, should the ITER experiment fail to go forward,  
12          then the construction of a domestic burning plasma  
13          experiment should be pursued aggressively.

14          (9) The National Research Council has also  
15          called for a broadening of the Fusion Energy  
16          Sciences Program research base as a means to more  
17          fully integrate the fusion science community into the  
18          broader scientific community.

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

1           (11) The Department of Energy’s Fusion En-  
2           ergy Sciences Advisory Committee has been recently  
3           tasked with the development of a plan to dem-  
4           onstrate the provision of fusion power to the United  
5           States electric grid within 35 years. Although this  
6           effort is to be commended, Congress finds that the  
7           importance of the development of fusion energy war-  
8           rants that every effort be made to credibly accelerate  
9           this timeframe.

10 **SEC. 3. GOALS.**

11       It shall be the goal of the United States to dem-  
12       onstrate electric power and hydrogen production for the  
13       United States energy grid utilizing a fusion energy device  
14       at the earliest date possible. It shall also be the goal of  
15       the United States to develop the scientific, engineering,  
16       and commercial infrastructure necessary to ensure that  
17       the United States is wholly competitive with other nations  
18       in providing fusion energy for its own needs and the needs  
19       of other nations.

20 **SEC. 4. PLAN FOR FUSION ENERGY SCIENCES PROGRAM.**

21       (a) DECLARATION OF POLICY.—It shall be the policy  
22       of the United States to conduct research, development,  
23       demonstration, and commercial application activities to  
24       provide for the scientific, engineering, and commercial in-  
25       frastructure necessary to ensure that the United States

1 is competitive with other nations in providing fusion en-  
2 ergy for its own needs and the needs of other nations, in-  
3 cluding by demonstrating electric power or hydrogen pro-  
4 duction for the United States energy grid utilizing fusion  
5 energy at the earliest date possible.

6 (b) FUSION ENERGY PLAN.—

7 (1) IN GENERAL.—Not later than 6 months  
8 after the date of enactment of this Act, the Sec-  
9 retary of Energy shall transmit to Congress a plan  
10 for carrying out the policy set forth in subsection  
11 (a), including cost estimates, proposed budgets, po-  
12 tential international partners, and specific programs  
13 for implementing such policy.

14 (2) REQUIREMENTS OF PLAN.—Such plan shall  
15 also ensure that—

16 (A) existing fusion research facilities are  
17 more fully utilized;

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

21 (C) new magnetic and inertial fusion re-  
22 search facilities are selected based on scientific  
23 innovation, cost effectiveness, and their poten-  
24 tial to advance the goal of practical fusion en-  
25 ergy at the earliest date possible;

1 (D) the facilities that are selected are  
2 funded at a cost-effective rate;

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

7 (F) inertial confinement fusion facilities  
8 are utilized to the extent practicable for the  
9 purpose of inertial fusion energy research and  
10 development;

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

14 (H) to the extent practical, the rec-  
15 ommendations of the March 2004 Fusion En-  
16 ergy Sciences Advisory Committee report on  
17 Workforce Planning are carried out, including  
18 periodic assessment of program needs.

19 (3) REPORT ON FUSION MATERIALS AND TECH-  
20 NOLOGY PROJECT.—The plan required by this sub-  
21 section shall also address the status of, and to the  
22 degree possible, the costs and schedules for—

23 (A) the design and implementation of  
24 international or national facilities for the test-  
25 ing of fusion materials; and

1 (B) the design and implementation of  
2 international or national facilities for the test-  
3 ing and development of key fusion technologies.

4 **SEC. 5. ITER.**

5 (a) AGREEMENT.—(1) The Secretary of Energy is  
6 authorized to negotiate an agreement for United States  
7 participation in ITER.

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

10 (A) clearly define the United States financial  
11 contribution to construction and operating costs;

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

16 (C) ensure that the United States will not be fi-  
17 nancially responsible for cost overruns in compo-  
18 nents manufactured in other ITER participating  
19 countries;

20 (D) guarantee the United States full access to  
21 all data generated by ITER;

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

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

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

6       (b) PLAN.—The Secretary of Energy, in consultation  
7       with the Fusion Energy Sciences Advisory Committee,  
8       shall develop a plan for the participation of United States  
9       scientists in ITER that shall include the United States  
10      research agenda for ITER, methods to evaluate whether  
11      ITER is promoting progress toward making fusion a reli-  
12      able and affordable source of power, and a description of  
13      how work at ITER will relate to other elements of the  
14      United States fusion program. The Secretary shall request  
15      a review of the plan by the National Academy of Sciences,  
16      the results of which the Secretary shall transmit to Con-  
17      gress not later than 90 days after the date of enactment  
18      of this Act.

19      (c) LIMITATION.—No Federal funds shall be ex-  
20      pended for the construction of ITER until the Secretary  
21      of Energy has transmitted to Congress—

22           (1) the agreement negotiated pursuant to sub-  
23      section (a) and 120 days have elapsed since that  
24      transmission;

1           (2) a report describing the management struc-  
2           ture of ITER and providing a fixed dollar estimate  
3           of the cost of United States participation in the con-  
4           struction of ITER, and 120 days have elapsed since  
5           that transmission;

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

11          (4) the plan required by subsection (b) (but not  
12          necessarily the National Academy of Sciences review  
13          of that plan), and 60 days have elapsed since that  
14          transmission.

15 **SEC. 6. PLAN FOR FUSION EXPERIMENT.**

16          If at any time during the negotiations on ITER, the  
17          Secretary determines that construction and operation of  
18          ITER is unlikely or infeasible, the Secretary shall send  
19          to Congress, as part of the budget request for the fol-  
20          lowing year, a plan for implementing a domestic burning  
21          plasma experiment such as FIRE, including costs and  
22          schedules for such a plan. The Secretary shall refine such  
23          plan in full consultation with the Fusion Energy Sciences  
24          Advisory Committee and shall also transmit such plan to  
25          the National Academy of Sciences for review. The Sec-

1   retary shall transmit the results of that review to Congress  
2   not later than 1 year after the date of enactment of this  
3   Act.

4   **SEC. 7. DEFINITIONS.**

5       As used in this Act—

6           (1) the term “construction” means the physical  
7       construction of the ITER facility, and the physical  
8       construction, purchase, or manufacture of equipment  
9       or components that are specifically designed for the  
10      ITER facility, but does not mean the design of the  
11      facility, equipment, or components;

12          (2) the term “FIRE” means the Fusion Igni-  
13      tion Research Experiment, the fusion research ex-  
14      periment for which design work has been supported  
15      by the Department of Energy as a possible alter-  
16      native burning plasma experiment in the event that  
17      ITER fails to move forward; and

18          (3) the term “ITER” means the international  
19      burning plasma fusion research project in which the  
20      President announced United States participation on  
21      January 30, 2003.

22   **SEC. 8. AUTHORIZATION OF APPROPRIATIONS.**

23       (a) FUSION ENERGY SCIENCES PROGRAM.—There  
24   are authorized to be appropriated to the Secretary of En-

1 ergy for the Fusion Energy Sciences Program, excluding  
2 activities described in sections 5 and 6—

3 (1) for fiscal year 2006, \$335,000,000;

4 (2) for fiscal year 2007, \$349,000,000;

5 (3) for fiscal year 2008, \$362,000,000;

6 (4) for fiscal year 2009, \$377,000,000; and

7 (5) for fiscal year 2010, \$393,000,000.

8 (b) ITER.—There are authorized to be appropriated  
9 to the Secretary of Energy for activities described in sec-  
10 tion 5 such sums as are necessary for each of the fiscal  
11 years 2006 through 2010.

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