



*Top, the Shiva laser target chamber for experiment on fusion reactions at Lawrence Livermore Laboratory; bottom, the PDX Tokamak experimental fusion reactor, a magnetic confinement project at Princeton.*

## The Fusion Energy Research Act of 1980

*The following are excerpts from Rep. Mike McCormick's bill H.R. 6370*

H.R. 6370

### IN THE HOUSE OF REPRESENTATIVES

Mr. McCormack introduced the following bill; which was referred to the Committee on Jan. 22

#### A BILL

To provide for an accelerated program of research and development of magnetic fusion energy technologies leading to the construction and successful operation of a magnetic fusion demonstration plant in the United States before the end of the 20th century to be carried out by the Department of Energy.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that this Act may be cited as the "Fusion Energy Research, Development, and Demonstration Act of 1980".*

#### Findings and policy

SEC. 2. (a) The Congress hereby finds that—

(1) the United States of America continues to be dependent on imported oil, and is faced with a finite and diminishing resource base of native fossil fuels;

(2) the current imbalance between supply and demand for fuels and energy in the United States is likely to grow each year for many years, aggravating an energy crisis and threatening the economic strength and national security of the Nation;

(3) the energy crisis can only be solved by firm and decisive action by the Federal Government to conserve

energy consumption in every realistic manner and to develop as quickly as possible a diversified and pluralistic national energy production capability;

(4) it is the proper and appropriate role of the Federal Government to undertake research, development, and demonstration programs in fusion energy technologies;

(5) fusion is the process by which the sun makes its energy, and every nation of our world possesses in the oceans and waters of our planet an easily accessible and inexhaustible supply of fuel for fusion energy which cannot be embargoed, is inexpensively recoverable, and is usable with minimal environmental impact;

(6) the early demonstration of the feasibility of using magnetic fusion energy systems for the generation of electricity and the production of heat, hydrogen, and other synthetic fuels will initiate a new era of energy abundance for all mankind forever;

(7) the widespread use of fusion energy systems to supplement and eventually replace conventional methods for the generation of electricity will help provide energy independence for all nations of the world;

(8) the spectacular successes encountered in magnetic fusion energy research since mid 1978 provide fusion scientists throughout the world with the confidence that the time has come to move aggressively into the engineering phase of fusion development; and that the conditions required for scientific breakeven can be obtained in devices now under construction;

(9) the early development and export of fusion energy systems, consistent with the established preeminence of the United States in the field of high technology products, will improve the economic posture of the United States, and ultimately reduce the pressures for international strife by providing access to energy abundance for all nations;

(10) innovation and creativity in the development of fusion energy components and systems can be fostered through continued research of alternate concepts which show promising potential; and

(11) it is contemplated that the programs established by this Act will require the expenditure of approximately \$20,000,000,000 during the next twenty years.

**3(b)** It is therefore declared to be the policy of the United States and the purpose of this Act to establish an aggressive

research, development, and demonstration program involving magnetic fusion energy systems. Further, it is declared to be the policy of the United States and the purpose of this Act that the objectives of this research, development, and demonstration program are—

(1) to proceed immediately with all work necessary to construct and operate a Fusion Engineering Test Facility by the calendar year 1986;

(2) to follow the operation of the Fusion Engineering Test Facility with all steps necessary to construct and successfully operate a magnetic fusion demonstration facility before the end of this century.

(3) to maintain, and where appropriate expand, the base programs for fusion energy research, and the development and testing of appropriate alternative confinement technologies;

(4) to maintain a strong research and development program in advanced fusion fuels; and

(5) to take appropriate measures to ensure the maintenance of an uninterrupted source of scientific and engineering talent from the Nation's colleges and universities in support of the magnetic fusion energy effort.

## **Definitions**

**SEC. 3.** For purposes of this Act—

(1) a "fusion energy system" is a system of components which uses magnetic fields and appropriate monitoring and control systems to contain a hot, highly ionized gas (called a plasma) for the purpose of creating a controlled environment in which a fusion reaction can proceed, and which may include additional components such as energy storage and conversion devices, and systems to generate electricity or produce hydrogen and other synthetic fuels;

(2) the term "magnetic fusion energy system" may be used interchangeably with the term "fusion energy system";

(3) "fusion" refers to the process whereby two very light nuclei (e.g. deuterium and tritium) are forced together, forming a compound nucleus, which subsequently separates into constituents which are different from the original colliding nuclei, with an accompanying energy release;

(4) the term "Fusion Engineering Test Facility" (FETF) refers to a fusion energy system designed to

achieve net energy production; and may involve any or all of the generic engineering systems necessary for the construction of a demonstration plant;

(5) the term "Fusion Demonstration Plant" (FDP) refers to a full-scale prototype production plant designed to demonstrate the safety, reliability, duty factors, and maintenance standards of a fusion energy system, including the generation of electricity or the production of synthetic fuels;

(6) the term "advanced fusion fuels" refers to fuels which will undergo a fusion reaction, other than that involving deuterium with tritium;

(7) "scientific breakeven" refers to the condition existing when sufficient fusion reactions are occurring to produce as much power as is consumed in creating the conditions for the fusion reactions to occur;

(8) "facility" means any building complex, or other device constructively employing fusion systems; and

(9) "Secretary" means the Secretary of Energy.

### **Research, development, and demonstration of magnetic fusion energy systems**

**SEC. 4. (a)** The Secretary is directed to establish immediately and carry forth such research, development, and demonstration programs, projects, or activities as may be necessary to meet the objectives of this Act as set forth in section 2(b). As a part of any such program, project, or activity, the Secretary shall—

(1) conduct and promote the coordination and acceleration of research, development, and demonstration programs relating to magnetic fusion energy systems and components thereof;

(2) seek support from and encourage cooperative efforts with the U.S. private sector—and with other governments in carrying out the purposes of this Act;

(3) study the potential of using fusion energy systems for the production of hydrogen and other synthetic fuels, and for other non-electric applications; and

(4) investigate the potential of using fusion power for the electrification of all or part of domestic ground transportation systems.

### **Dissemination of information and other activities to educate the public on the use of fusion energy technologies**

**SEC. 5.** The Secretary shall take all possible steps to

assure that full and complete information with respect to the potential benefits of fusion energy, and the status and progress of fusion research, development, and demonstration is made available to Federal, State, and local authorities, relevant segments of the economy, the scientific and technical community, and the public at large, both during and after the close of the programs under this Act, with the objective of promoting and facilitating to the maximum extent feasible the early and widespread knowledge of the practical uses of fusion energy throughout the United States.

### **Authorization of appropriations**

**SEC. 6.** There is hereby authorized to be appropriated to the Secretary, for the fiscal year ending September 30, 1981, \$500,000,000, inclusive of any funds otherwise authorized to the Secretary for the purpose of research, development, and demonstration of magnetic fusion energy technologies, and for each succeeding fiscal year such sums as may hereafter be provided in annual authorization Acts.

## **A pledge of support**

*The following "Resolution in Support of the McCormack Bill," H.R. 6370, is now being widely circulated by the Fusion Energy Foundation, a private, non-profit scientific agency.*

We (I) support the call for rapid passage of Congressman Mike McCormack's (D-Wa) bill, H.R. 6370, calling for an Apollo-style national fusion program to produce a demonstration commercial fusion reactor by the year 2000.

The on-going collapse of the U.S. nuclear industry and the decline of fundamental energy and science research have been a key factor in damaging the U.S. economy and weakening the United States' position in the world. The McCormack bill may be the last available cutting edge to reverse this collapse of energy policy.

We (I) therefore call on the Congress quickly to pass the McCormack bill as a necessary step in guaranteeing future world energy supplies, a healthy, growing U.S. economy, and restoring the U.S. to world scientific and technological leadership.

Political leaders of all parties should immediately get behind this bill.