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Senate

Mr. TSONGAS. Mr. President, the Magnetic Fusion Engineering Act of 1980 has developed widespread, bipartisan support. Its passage by the Senate represents a consensus—that fusion energy is a significant component of our national energy program and one of our major efforts to insure our long-term energy security.

Fusion holds great promise as an inexhaustible resource and has the potential for achieving a high degree of safety with an acceptable level of social and environmental impact. Its fuel is low-cost and abundant. It does not have the accident potential nor the nuclear waste problem associated with nuclear fission. Major progress in all aspects of magnetic fusion technology during the past decade has instilled confidence that power production from fusion is achievable. It is a flexible energy source as well—capable of generating high temperature heat, electricity, hydrogen, and synthetic fuels. With advanced fusion fuels, electricity may be produced through direct conversion which is 70-percent efficient. While the ultimate economic size of fusion powerplants cannot be estimated wtih any certainty, fusion could complement decentralized renewable energy sources, providing centralized power where appropriate and substituting for coal and nuclear fission plants.

Fusion is the fundamental energy process that powers the sun. It involves combining isotopes of hydrogen, which can be extracted from water, to form helium. To make this energy releasing reaction occur, it is necessary to heat the hydrogen gas to hundreds of millions of degrees and confine it with a very strong magnetic field.

During the 1970's, American's magnetic fusion program resolved many of the questions about establishing these physical conditions needed to sustain the fusion process. The program has been well managed, the personnel are top-notch, and the results have been very impressive. We are now ready to shift the program from one focused on scientific feasibility to one focused on engineering feasibility. While continuing to maintain a broad basic R. & D. program, it is time to start resolving the engineering questions involved in an operating fusion reactor.

The bill does not suggest that fusion is the ultimate energy source. It will not be a cheap source of power. If we cannot solve the many engineering challenges that exist, fusion may never become an economic energy source. There will be some radioactive materials used in the fusion plant, and they must be handled carefully. Some parts of the fusion device may become radioactive and will have to be disposed of. All of these issues need to be resolved through an accelerated program of research, development and demonstration so that the commercial potential and the social and environmental issues can be assessed.

But thus far, compared to fission, fusion appears likely to result in less long-lived radioactive waste, much smaller accident potential, no risk of a meltdown and significantly reduced nuclear proliferation risk. Compared to coal, fusion produces no CO_2, SO_x, or NO_x. This does not mean that we can afford to devote less attention or fewer

resources to near term energy options. Nor should we launch a crash program that ignores engineering reality and results in less than adequate attention to potential problems. The Magnetic Fusion Engineering Act establishes a program that may ultimately cost $20 billion but sets a realistic pace and is aimed at determing whether fusion is a viable option, whether it is competitive with alternative energy sources, and what role it will play in our energy mix.

This bill is principally a statement of national policy and program direction to provide for an accelerated research, development, and demonstration program to achieve confirmation of the engineering feasibility of magnet fusion and to move us closer to commercial development. It does not include new spending authority for fiscal year 1981, but it does call for a doubling of funding in real terms over the next 7 years and 25-percent increases in fiscal year 1982 and fiscal year 1983. It calls for the operation of a magnet fusion engineering device based on the best available confinement concept—not later than 1990. Operation of a commercial demonstration plant is sought by 2000. A comprehensive management plan for research, development, and demonstration will be devised. Participation by industry in the fusion program is promoted. The bill requires DOE to prepare a plan to develop a national magnetic fusion engineering center to consolidate and coordinate major magnetic fusion engineering devices and associated activities. International cooperative agreements will be strengthened. Technical manpower requirements will be assessed.

Mr. President, the list of cosponsors of this bill span the entire political spectrum. Its broad support is evidence that this issue is not polarized as in the case of nuclear fission. Even though a demonstration plant is 20 years away, this energy source is being taken seriously because we recognize the need to invest in our energy future today. The Magnetic Fusion Engineering Act of 1980 will help mobilize national resources to overcome the obstacles to fusion and to speed its commercial use. It is a direct step forward toward developing an energy policy that addresses our long-term energy future.