



INSTITUTE FOR FUSION STUDIES
THE UNIVERSITY OF TEXAS AT AUSTIN

Robert Lee Moore Hall • Austin, Texas 78712-1060 • (512) 471-1322 • fax (512) 471-6715

November 25, 2002

Dr. Ray Orbach
Director, Office of Science
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Dr. Orbach:

The Fusion Energy Sciences Advisory Committee (FESAC) submits with this letter the preliminary report of its Fusion Development Path Panel. Chaired by Professor Rob Goldston, the Panel has responded to your charge of September 10, asking for a report on the “prospects and practicability of electricity into the U.S. grid from fusion in 35 years.” The charge requests a report in two stages; here we submit the first stage, which outlines a plan and identifies (in the words of the charge) “significant issues that deserve immediate attention.” The second stage, to be submitted in March, will provide a much more detailed plan, including cost estimates. The present Preliminary Report has the unanimous, unqualified endorsement of FESAC.

Upon receiving your charge in September, I wrote you on behalf of FESAC to emphasize that “recent advances in fusion science have wrought fundamental change. In particular, such advances allow a sober assessment of fusion power production as something that determined scientists and strong research support could achieve within three or four decades.” The Panel’s conclusions reinforce that statement. After identifying the key hurdles and outlining how they can be addressed, the Panel concludes that its preliminary plan “can lead to the operation of a demonstration fusion power plant in about 35 years and enable the commercialization of fusion power.”

The Panel recognizes that “significant scientific and technological challenges remain for the development of fusion as a practical energy source...” These challenges will require continued strong emphasis on scientific research of the highest quality and breadth, including in particular both magnetic and inertial confinement. They will also call for significant funding increases, a matter to be explored in detail in the second phase of the panel’s investigation.

FESAC wishes to underscore a key conclusion of the Development Path Panel by quoting from the Executive summary of the Preliminary Report:

“Dramatic scientific and technological advances have been achieved over the last decade, from the understanding and control of turbulence in magnetically confined plasmas to the demonstration of the positive impact of improved

symmetry control in inertial confinement. This strengthened scientific understanding of fusion systems, bolstered by the application of advanced computing, provides enhanced confidence that practical fusion systems can be realized. Increased concern about the impact of human activity on the global ecosystem points to the need for new broadly available, non-polluting energy sources such as fusion. In addition, escalating international tensions underscore the importance of long-term national energy security. A commitment now to expend the additional resources to develop fusion energy within 35 years is timely and appropriate.”

This statement summarizes accurately the perspective of FESAC.

Yours truly,



Richard Hazeltine

Chair, Fusion Energy Sciences Advisory Committee

Enclosure

cc: N. A. Davies
FESAC