

Fusion Energy Sciences Strategic Plan Overview

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U.S. DEPARTMENT OF
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Outline

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- Strategic Plan Overview
 - Three Strategic Themes
 - Fusion Energy Source
 - Plasma Sciences
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Motivation for Planning

- Plan for the ITER/burning plasma era
- Exploit new opportunities in plasma science, including high energy density laboratory plasmas (HEDLP)
- Respond to House Appropriations Committee Report of June 2008

“Given the tremendous potential of fusion energy to provide a long term solution to our energy needs, this Committee believes it is essential that the U.S. continue to play a leadership role in this area. To this end, the Department is directed to provide the Committee with a report no later than March 1, 2009 which describes a bold, credible plan for a world-leading U.S. fusion program as this area becomes an increasingly international endeavor.”

Strategic Planning Process

■ Major Steps





Mission

- Advance the fundamental science of plasmas and develop the knowledge needed to create a sustainable fusion energy source.



Three Strategic Themes

■ Fusion Energy Source

- Develop the knowledge needed to create a sustainable fusion energy source

■ Plasma Sciences

- Pursue scientific opportunities and grand challenges in plasma science, including high energy density plasma science, to better understand our universe and to enhance national security and economic competitiveness

■ Management Excellence

- Acquire the organizational and management capability needed to carry out the program missions



Fusion Energy Source

- Strategic Goals:

- Foster the success of ITER and maximize the benefit of the U.S. participation in ITER
- Improve our understanding of how the properties of a confined plasma are determined by the confinement configuration



Fusion Energy Source

- Strategic Goals (continued):
 - Develop the knowledge needed to achieve predictable, high-performance, steady-state burning plasmas
 - Develop the knowledge to design and build components that can survive the enormous heat, plasma, and neutron fluxes of the fusion environment
 - Develop the materials and engineering science needed to harness fusion power



Strategies to Achieve the First Fusion Energy Source Goal

- Foster the success of ITER...
 - Prepare for ITER operations by investigating critical scientific and technical issues through coordinated international scientific campaigns
 - Develop predictive theoretical and computational models of fusion plasmas validated against results from current experiments
 - Establish a U.S. burning plasma research team that is fully integrated with the teams of our ITER partners



Plasma Sciences

- Strategic Goals:

- Increase our fundamental understanding of basic plasma science, including low temperature plasma science and engineering
- Leverage DOE investments in major facilities to advance the fundamental science of high energy density plasmas



Strategies to Achieve the First Plasma Sciences Goal

- Increase the fundamental understanding of basic plasma science ...
 - Determine the high impact areas of basic plasma science and underlying disciplines, such as atomic physics, and engage the research communities in these areas through openly competed solicitations (joint with other agencies as appropriate)
 - Decide on the role of focused science centers and establish/re-compete them through openly competed solicitations



Management Excellence

- Strategic Goals:

- Maintain a world-class workforce
- Promote the communication capabilities needed to support geographically distributed researchers
- Acquire the project management capability to manage large, complex, national and international fusion projects



Future Steps

- Consider input from FESAC members and complete the Strategic Plan Overview
- Send the plan to FESAC in late November/early December
- Receive comments on the plan from FESAC in January
- Prepare final Strategic Plan Overview and submit it to Congress by March



Questions for Discussion

- What can the U.S. do in parallel with ITER to maintain a leadership role in the development of fusion energy?
- How should the U.S. determine which initiatives to undertake individually and which to undertake internationally (either as a partner or as the host)?