

NUCLEAR ENERGY ENABLING TECHNOLOGIES

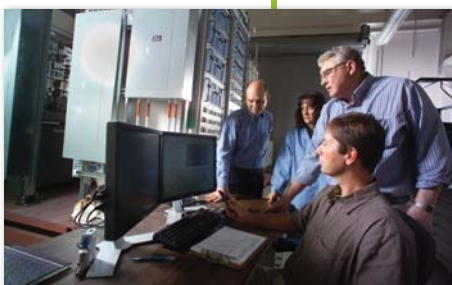
The U.S. Department of Energy's Office of Nuclear Energy

The Nuclear Energy Enabling Technologies (NEET) program will focus on innovative research relevant to multiple reactor and fuel cycle concepts that offer the promise of dramatically improved performance.

The new Nuclear Energy Enabling Technologies (NEET) program proposed in FY 2011 will develop crosscutting technologies that directly support and complement the Office of Nuclear Energy's (NE) development of new and advanced reactor concepts and fuel cycle technologies. It will encourage the development of transformative, "outside-the-box" solutions across the full range of nuclear energy technology issues.

BENEFITS OF THE INITIATIVE

Pursuing crosscutting and transformative nuclear technologies and capabilities for incorporation into advanced reactor and fuel cycle concepts offers the promise of revolutionary improvements in safety, performance, reliability, economics, and proliferation risk reduction. It promotes creative solutions to the broad array of nuclear energy problems related to reactor and fuel cycle development. The activities undertaken in this program complement those within the Reactor Concepts RD&D and Fuel Cycle R&D programs by providing a mechanism for pursuing broadly applicable R&D in areas that may ultimately benefit specific reactor and fuel cycle technology development.



PROGRAM ELEMENTS

The NEET program consists of three elements:

- Crosscutting Technology Development;
- Transformative Nuclear Energy Concepts R&D; and the
- Energy Innovation Hub for Modeling and Simulation

The Crosscutting Technology Development —

activity provides R&D support for the various nuclear energy concepts (existing and future) in areas such as reactor materials, advanced methods for manufacturing and field installation, new sensor technologies for monitoring material and equipment conditions in existing reactors, and creative approaches to further reduce proliferation risks.

The Transformative Nuclear Concepts R&D —

will support, via an open, competitive solicitation process, investigator-initiated projects that relate to any aspect of nuclear energy generation — reactor and power conversion technologies, enrichment, fuels and fuel management, waste disposal, nonproliferation, and so forth — ensuring that good ideas have sufficient outlet for exploration. The research on

Program Budget

Nuclear Energy Enabling Technologies (\$ in Millions)		
Crosscutting Technology Development		
FY 2010 Actual	FY 2011 Request	
\$0.0	\$43.3	
Transformative Nuclear Concepts R&D		
FY 2010 Actual	FY 2011 Request	
\$0.0	\$28.9	
Energy Innovation Hub for Modeling and Simulation		
FY 2010 Actual *	FY 2011 Request	
\$0.0	\$24.3	
Small Business Innovation Research (SBIR)/ Small Business Technology Transfer Program (STTR)		
FY 2010 Actual	FY 2011 Request	
\$0.0	\$2.8	
Total, Nuclear Energy Enabling Technologies		
FY 2010 Actual	FY 2011 Request	
\$0.0	\$99.3	

* In FY 2010, \$21.4 million was included in the Generation IV budget

transformative nuclear concepts will pursue non-traditional nuclear energy ideas that offer the potential for improved system performance and may radically alter nuclear system configuration and development needs. This could include the development of specialized nuclear fuels, revolutionary materials, new enrichment techniques, tailored coolants, new techniques for energy conversion, or other innovations.

The Energy Innovation Hub for Modeling and Simulation —

will apply existing modeling and simulation capabilities to create a “virtual” reactor user environment for engineers to simulate a currently operating reactor. A separate fact sheet is available for the Energy Innovation Hub for Modeling and Simulation.

PLANNED PROGRAM ACCOMPLISHMENTS^a

FY 2011

- Evaluate and prioritize innovative structural materials for use in radiation environments and high temperature applications.
- Consider approaches such as the use of ion beams to simulate accelerated aging of materials.
- Develop a detailed project plan for quantification of proliferation risk and initiate studies on current risk assessment methodologies.
- Complete the advanced manufacturing and field installation technology study and research roadmap.
- Initiate competitively selected high-potential R&D activities that improve nuclear plant manufacturing and field installation efficiency.
- Perform research to develop advanced sensors to improve physical measurement accuracy and reduce uncertainty.
- Perform research on digital monitoring and control technology, fiber optic and wireless digital instruments and highly integrated control systems to improve performance and reliability.
- Solicit, competitively select and initiate R&D project awards from national laboratories, universities, research institutions, and industry proposals.

^a See separate Fact sheet for FY 2011 accomplishments associated with the Energy Innovation Hub for Modeling