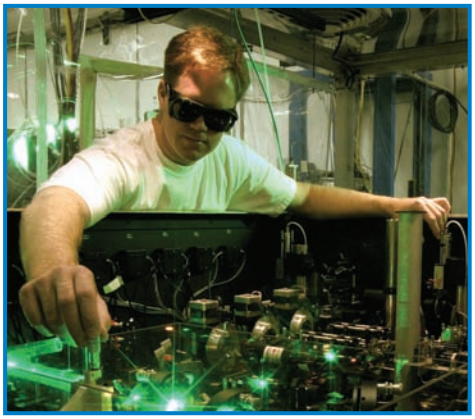
Nuclear Energy Research Initiative

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

A focused research and development program ensures the United States will have the energy it needs in the next century.



The Nuclear Energy Research Initiative (NERI) addresses potential long-term barriers to expanding the use of nuclear energy. Universities and National labs are working together to advance new technologies.

The NERI program was established in FY 1999 to sponsor innovative scientific and engineering research and development (R&D) to address the key issues affecting the future use of nuclear energy and to advance U.S. leadership in nuclear science and technology.

To achieve these long-range goals, the NERI program established the following objectives:

- To develop advanced concepts and scientific breakthroughs in nuclear fission and reactor technology to address and overcome the principal technical obstacles to the expanded use of nuclear energy.
- To advance the state of nuclear technology in the United States to maintain a competitive position in overseas markets and a future domestic market.
- To promote and maintain a nuclear science and engineering infrastructure to meet future technical challenges.

An Evolving Program

NERI's roots date back to January 1997, when the President tasked his Committee of Advisors on Science and Technology (PCAST) to evaluate the current national energy R&D portfolio and provide a strategy to ensure the Unite States has a program to address the Nation's energy and environmental needs for the next century.

Top Photo Courtesy of Peter Ginter
Photo of Auburn University (Back) Courtesy of J. Glover

U.S. universities, such as Auburn (shown here), play a key role in NERI

In its November 1997 report, the PCAST Panel on Energy Research and Development determined that establishing nuclear energy as a viable and expandable option was important and that properly focused R&D was needed to address the potential long-term barriers to expanding the use of nuclear power (e.g., spent nuclear fuel, proliferation, safety, and economics).

The PCAST panel recommended that the Department of Energy (DOE) reinvigorate its nuclear energy R&D activities in a unified effort to address these barriers. DOE and Congress endorsed the PCAST recommendations and established the NERI program in FY 1999. Through the NERI program, DOE's Office of Nuclear Energy (NE) funds research based on competitive selection of proposals from the National laboratories, universities, and industry.

In FY 2004, NERI's mission was refocused on the participation of U.S. universities in DOE's mainline nuclear energy R&D programs. U.S. universities now play an important role in advancing the research goals and objectives of the:

- Advanced Fuel Cycle Initiative supporting the Global Nuclear Energy Partnership,
- Generation IV Nuclear Energy Systems Initiative and Next Generation Nuclear Plant (NGNP) Initiative, and
- Nuclear Hydrogen Initiative.

In FY 2009, NE will continue to support R&D activities at university and research institutions through competitive awards focused on advancing nuclear energy technologies. Through its NERI process, NE will designate at least 20 percent of funds appropriated to its R&D programs for work to be performed at university and research institutions. These funds will support investigator-initiated basic research and mission-specific applied R&D activities; human capital development activities, such as fellowships and young faculty awards; and infrastructure and equipment upgrades for university-based research reactors and laboratories.

Project Selection

NERI projects are selected through a competitive procurement process. A solicitation is issued by DOE requesting proposals from U.S. universities. National laboratories and industry partners are allowed to participate as collaborators.

Projects are selected based on independent, integrated, peer review, relevancy, and programmatic selection process. The duration of most projects is two to three years, pending appropriations.

Research is conducted in the following areas:

- Advanced reactor systems that improve safety, economics, and proliferation resistance, such as the Very High Temperature Reactor under the NGNP R&D activities and the Sodium-Cooled Fast Reactor.
- Advanced fuel cycle technologies for transmutation and Generation IV reactors that are cleaner, more efficient, less waste-intensive, and more proliferation resistant.
- Advanced energy systems and enabling technologies for hydrogen production. Specific research areas are defined in the solicitation.

Planned Program Accomplishments

FY 2008

- Continue research on projects initiated in FY 2006 and FY 2007.
- Conduct a program review on FY 2006 and FY 2007 projects.

FY 2009

- Continue research on projects initiated in FY 2006 and FY 2007.
- Solicit and award new NERI projects.