

Advanced Nuclear Fuels **ACCELERATING ADOPTION**

New and advanced nuclear fuels and cladding materials show promise to deliver more energy while producing less waste than today's counterparts. But before these technologies are adopted in commercial reactors, they must be demonstrated to improve performance and safety.

CHALLENGE



MOVING FROM CONCEPT TO COMMERCIALIZATION

Innovative fuel technologies can take several years to reach the market.



BROOKHAVEN LAB SOLUTION



NUCLEAR FUEL MODELING AND SIMULATION

Brookhaven National Laboratory's suite of advanced computational tools and technical expertise in nuclear regulation can expedite the pace of technology licensing and deployment.

In 2011, the U.S. Department of Energy (DOE) Office of Nuclear Energy chartered a three-year study among several DOE labs to evaluate and screen nuclear fuel cycle options (from mining to disposal) with respect to fuel cycle performance. Brookhaven Lab scientists helped guide future research and development efforts by identifying fuel cycles with the potential to provide substantial improvements over the existing U.S. fuel cycle.



WORK WITH US

As part of its pursuits in fundamental and applied research, Brookhaven National Laboratory, which is located approximately 60 miles east of New York City on Long Island, partners and collaborates with public and private entities, including other federal agencies and national laboratories, academia, and industry—including small businesses and major corporations.

www.bnl.gov/partner



DIVERSE EXPERTISE

Brookhaven Lab conducts research involving physical and environmental sciences, energy technologies, and national security, which includes

- Nuclear Energy Technologies
- Energy Storage Solutions
- Material and Chemical Sciences
- Computational Science and Data Analytics
- Climate and Atmospheric Sciences



RESEARCH FACILITIES

The Nuclear Science and Technology Department is a leader in nuclear technology research and development, reactor reliability and risk assessment, and advanced nuclear modeling and simulation. Brookhaven Lab's capabilities include

- Design and performance analyses of conventional and advanced nuclear systems using state-of-the-art nuclear, thermal-hydraulic, mechanical, and structural codes
- Impact assessment on reactor performance and safety of accident-tolerant fuel concepts in commercial light-water reactors
- Market-based comparative analyses of conventional and hybrid competing energy systems
- Implementation of evaluated nuclear data for a full spectrum of applications, including nuclear system design and analysis, criticality safety, and homeland security
- Exploration of accelerator-driven systems for energy, defense, science, and commercial applications

<https://www.bnl.gov/nst/>

BROOKHAVEN
NATIONAL LABORATORY



CONTACT:

Michael Todosow

Fuel Cycle Research and Development Program Manager
Nuclear Science and Technology Department
todosowm@bnl.gov | (631) 344-2445
P.O. Box 5000, Upton, NY 11973-5000



U.S. DEPARTMENT OF
ENERGY | Office of
Science