2022 ANS Annual Meeting
GAIN Innovative Nuclear Materials Workshop

Avila A Room, Hilton Anaheim, Anaheim, CA
Wednesday, June 15, 2022, 1:00 - 5:30 p.m.

U.S. DEPARTMENT OF ENERGY

DOE-NE FY23 Budget Request - Fuel Cycle Research and Development

	FY 2021 Enacted	FY 2022 Annualized CR	FY 2023 Request	FY 2023 Request vs FY 2021 Enacted ($)	FY 2023 Request vs FY 2021 Enacted (%)
Fuel Cycle Research and Development					
Material Recovery and Waste Form Development	25,000	25,000	38,000	+13,000	+52%
Mining, Conversion, and Transportation	2,000	2,000	1,500	-500	-25%
Civil Nuclear Enrichment	40,000	0	0	-40,000	-100%
Accident Tolerant Fuels	105,800	105,800	113,900	+8,100	+8%
TRISO Fuel and Graphite Qualification	36,000	36,000	27,000	-9,000	-25%
Fuel Cycle Core R&D	20,000	20,000	46,500	+26,500	+133%
High-Assay, Low-Enriched Uranium Availability	0	0	95,000	+95,000	+100%
Used Nuclear Fuel Disposition R&D	62,500	62,500	46,875	-15,625	-25%
Integrated Waste Management System	18,000	18,000	53,000	+35,000	+194%
Total, Fuel Cycle Research and Development	**309,300**	**309,300**	**421,775**	**+112,475**	**+36%**

DOE-NE FY23 Budget Request - Fuel Cycle Research and Development

Fuel Cycle Core R&D plans to support: (1) Materials Protection, Accounting and Control Technologies, (2) Systems Analysis and Integration, (3) Innovative Process Control Capabilities, (4) **Innovative Nuclear Materials**, and (5) Advanced Reactor Fuels.

Proposed new Innovative Nuclear Materials program goals:

- ✓ Establish robust nuclear materials core competencies and R&D capabilities at DOE national labs and U.S. universities;
- ✓ Capitalize on recent breakthroughs in computational modeling capabilities, advanced instrumentation methods, characterization tools, and nanoscience and manufacturing to accelerate new nuclear materials discovery and applications
- ✓ Support nuclear materials research community to train broad-based next generation expertise; and
- ✓ Provide a technical basis for supporting the U.S. industries' goal for commercialization of advanced reactor technologies.

Innovative Nuclear Materials Workshop

Workshop – To seek stakeholders' input on research opportunities in advanced nuclear materials, with a focus on novel and technically challenging cladding materials that have the potential to revolutionize or transform future nuclear energy applications.

We do not seek to support:

Scale-up research; small-scale and at-scale demonstration; deployment leading to market adoption; high cost-sharing with industry partners; industrial partnership for prototyping.

Innovative Nuclear Materials – Questions to Answe r Examples

How to mitigate cladding materials degradation under irradiation?

Can we predict microstructural and chemical evolution during irradiation?

Can we develop multiscale modeling of microstructural stability of irradiated materials?

How to improve our understanding of deformation and fracture modeling?

How to control and manipulate self-protective interfacial reaction mechanisms?

How to design new generation of non-traditional materials with revolutionary functionality?

What are potential technology showstoppers for novel materials processes and advanced manufacturing technologies?