Congress has not yet passed a budget for fiscal year (FY) 2025, therefore GAIN is currently using FY 2024 and prior year funding to support the second round of vouchers in FY25, which limits the breadth of funding available to applicants. To help ensure that companies can focus their efforts for the second round of vouchers, GAIN is sharing the funding amounts that are available in the following areas. When the fiscal year 2025 appropriation is finalized, updated guidance will be provided.

For this round, all voucher applicants should refer to Table 1 below to confirm that their voucher request aligns with available funding. Below the table are examples of topics that could be supported by the various funding categories. For any questions, please reach out directly to the GAIN team at gain@inl.gov.

Table 1 – Maximum Funding Available per Program to Support GAIN Voucher Applications for FY25 Round 2

Funding Source	Light Water Reactor Sustainability (LWRS)	Accident Tolerant Fuel (ATF)	TRISO* Fuel & Graphite Qualification	Mining	Advanced Reactor Technologies (ART) Lab R&D	Advanced Small Modular Reactor (SMR) RD&D
Maximum Funding Available for Voucher Cycle FY25-2	$380,000	$734,000	$730,000	$240,000	$85,000	$384,000

*TRISO = TRi-structural ISOtropic

To help focus voucher applications for the next round, GAIN is sharing the areas of topics that can be funded. Applicants may propose a technical scope that can leverage multiple topic areas outlined in Table 1. Please reach out to the GAIN team at gain@inl.gov with any questions on how available topic areas can be leveraged.

Applications submitted during the second round of vouchers in FY25 that describe topics outside of the technical scopes outlined below and/or request more funding than what is available (See Table 1) will not be considered.

The following DOE subprogram descriptions and example topics under these funding areas are provided below:

Light Water Reactor Sustainability (LWRS) – The LWRS subprogram conducts research to develop technologies and other solutions to improve the economics and reliability, sustain the safety, and extend the operation of our nation's fleet of nuclear power plants. The two main objectives include: (1) providing science- and technology-based solutions to industry to overcome the current labor-intensive business model and associated practices; and (2) managing the aging of systems, structures, and components.

The activities this subprogram focuses on include, but are not limited to:

1. Plant modernization which includes replacement of legacy instrumentation and control (I&C) technologies for more automated and reliable plant operation
2. Flexible plant operation and generation which involves evaluation of economic opportunities, technical methods, and licensing needs for light water reactors to directly supply energy to various industrial processes
3. Risk-informed systems analysis for the optimization of safety margins and reduction of uncertainties to achieve high levels of safety and economic efficiencies
4. Materials testing and research for understanding, predicting, and measuring changes in materials and systems, structures, and components as they age in environments associated with continued long-term operations of existing nuclear power plants
5. Physical security to develop and enhance methods, tools, and technologies that advance the technical basis necessary to optimize and modernize a nuclear facility's security posture

Accident Tolerant Fuel (ATF) – The goal of the ATF subprogram is to develop advanced nuclear fuels and materials that are robust, have high performance capability, and are more tolerant to accident conditions than traditional fuel systems while maintaining the economic competitiveness of commercial nuclear power, and in particular in the near-term support the Accident Tolerant Fuel concepts under development by the three fuel vendor teams.

The activities this subprogram focuses on include, but are not limited to:

1. Development of coated zirconium cladding
2. Understanding the impact of doped fuel pellets on fuel pin performance

TRISO Fuel Qualification Program and Next Generation TRISO – The goals of the Advanced Gas Reactor (AGR) Program include assembling, irradiating, examining, and testing to provide baselined fuel form qualification data to support the licensing and operation of high temperature gas-cooled reactors (HTGRs). Current activities of the AGR Program related to TRi-structural ISOtropic (TRISO) fuel qualification include analysis and reporting for the AGR-3/4 TRISO experiment, which included designed-to-fail fuel to determine fission product retention behavior. Current activities also include post-irradiation examination and testing for the AGR-5/6/7 experiment, which serves as fuel qualification proof and fuel performance margin testing.

In addition to the AGR TRISO Program, the Next Generation Fuels Program is exploring future activities that may include R&D for coated particle fuels (e.g., TRISO particle fuel) that extends the AGR Program specifications to pursue improved performance for advanced forms of TRISO coated particle fuels.

Graphite Qualification – This subprogram supports R&D and other activities to enable technological advances and commercial viability to support the deployment of advanced

reactor technologies. Specifically, the Graphite qualification subprogram is performing activities that support material qualification of nuclear graphite grades for use in high temperature reactors, including both gas-cooled reactors and molten salt reactors.

The activities this subprogram focuses on include, but are not limited to:

1. Characterizing thermophysical properties and material degradation of graphite subjected to irradiation, oxidation and/or molten salt interactions
2. Developing predictive and degradation models for graphite behavior
3. Supporting American Society of Mechanical Engineers (ASME) Code development and the Nuclear Regulatory Commission (NRC) licensing assessment, including coordinating task groups to correct, clarify, and modify existing Code assessment methods and Design rules for both graphite and ceramic composites
4. Developing innovative domestic manufacturing technologies

Mining – This subprogram supports R&D that enables technological advances in uranium mining capabilities in the United States. This subprogram is especially interested in developing innovative tools and methods for in-situ uranium recovery technologies to enhance the efficiency of groundwater usage and reduce the cost of subsurface remediation.

The activities this subprogram focuses on include, but are not limited to:

1. Optimization of pore-scale mixing to improve the effectiveness of sweep operations and amendment deployment
2. Examination of the effect of acoustic stimulation on pore-scale mixing
3. Laboratory investigation of the potential impact of natural attenuation on the fate of uranium and other trace metals

Advanced Reactor Technologies (ART) Lab R&D – The ART Lab R&D subprogram supports research and development on innovative concepts utilizing coolants such as liquid metal, molten salt, or gas, to help reduce technical, regulatory and operational risks. The ART subprogram also supports the development of Supercritical Carbon Dioxide (sCO2) energy conversion technologies.

The activities this subprogram focuses on include, but are not limited to:

1. **Fast Reactor Technologies**: Addressing technical challenges to reduce capital costs and improve economic competitiveness and providing validated experimental and operational data supporting fast reactor licensing cases
2. **Molten Salt Reactor Technologies**: Investigation of fundamental salt properties and development of infrastructure, materials, models, fuels, and fuel mass accountability technologies for salt-cooled and salt-fueled reactors
3. **Gas Reactor Technologies**: Advanced alloy qualification, scaled experiments to support designs and licensing, and modeling and simulation activities

Advanced Small Modular Reactor (SMR) RD&D – The Advanced SMR RD&D subprogram supports research, development, and deployment activities to accelerate the near-term availability of U.S.-based SMR technologies into domestic and international markets. The economics of SMRs depend on them having fewer and smaller components, smaller site footprints, and reduced operations and maintenance requirements as compared to the existing fleet. This subprogram supports the development and deployment of concepts that can potentially improve SMR plant capability and performance while reducing capital, construction, operations, and maintenance costs.

The activities this subprogram focuses on include, but are not limited to:

1. Efforts that further the near-term domestic development and deployment of SMRs, to include those that offer simplified operation and maintenance for distributed power and load-following applications, and increased proliferation resistance and security
2. Resolving key regulatory issues identified by the NRC and industry related to the near-term deployment of SMRs