U. S. Department of Energy Office of Nuclear Energy (NE) Notice of Opportunity: NE Industry Voucher Program Request for Assistance

A. Overview

The Office of Nuclear Energy (NE) within the Department of Energy (DOE) provides annual fiscal year (FY) funds for vouchers to assist applicants accelerate their efforts to develop advanced nuclear energy technologies. The Gateway for Accelerated Innovation in Nuclear (GAIN), started in 2015, is a DOE program that connects the nuclear industrial community with the technical, regulatory, and financial support necessary to move new or advanced nuclear technologies toward commercialization and ensure the continued reliable and economical operation of the existing fleet. The NE Industry Voucher Program fulfills GAIN's objective of accelerated and cost-effective commercialization of innovative nuclear energy technologies by facilitating access to world class expertise and capabilities available across the United States (U.S.) DOE Laboratory Complex.

Vouchers are **NOT** financial awards made directly to applicants. Vouchers provide funding to a facility within the DOE complex to help eligible businesses overcome critical technological and commercialization challenges.

It is strongly suggested that prospective voucher applicants contact the GAIN Office, attention Chris Lohse (https://gain.inl.gov/about/contact-us/), or known contacts at DOE laboratories to ascertain the feasibility of the intended work scope and develop a focused cost estimate. The work scope and cost estimate are essential in the creation of a successful application.

Through the NE Industry Voucher Program, NE will accept applications focused on innovation that support the broader NE mission, which includes production and utilization of nuclear energy produced from fission (e.g., for increased generation of electricity, supply of process heat, synthetic fuels or chemicals production, etc.) in the following general topic areas:

- Analysis and evaluation of, and for, advanced reactor concepts and associated designs, including development of research and development (R&D)-based licensing, technical requirements, or regulatory strategies
- Analysis, evaluation, and technology development of fission reactors for space, maritime or defense applications
- Use of artificial intelligence to accelerate development and deployment of nuclear technologies, especially advanced reactors
- Advanced tools and methods to enhance in-situ recovery mining technologies
- Advanced nuclear fuel development, fabrication, and testing (including fuel materials and cladding)
- Development of improved methods and technologies for spent nuclear fuel and high-level waste management
- Advanced separation technologies for the recycle and reuse of valuable nuclear materials
- Assessment of concepts and approaches and technology for material control and accounting (MC&A), safeguards against proliferation, and security risks
- Structural material and component development, testing, and qualification
- Development, testing, and qualification of instrumentation, controls, and sensor technologies that are hardened for harsh environments and secured against cyber intrusion
- Modeling and simulation, nuclear applications of high-performance computing, codes, and

methods
- Technical assistance from subject matter experts and/or data/information to support technology development and/or assessment of key technical or licensing issues.

In general, the proposed work should be of an applied nature for an identified technology or system, i.e., beyond the stage of establishing the fundamental scientific principles. Proving out a fundamental scientific hypothesis or development of a new constitutive model for a physical phenomenon is **not** aligned with the NE Industry Voucher Program and would be considered out of scope. There are other DOE programs such as the Consolidated Innovative Nuclear Research (CINR) Notice of Funding Opportunity (NOFO) or Office of Science (SC) and Advanced Research Projects Agency–Energy (ARPA-E) funding opportunities that are focused on fundamental science or R&D.

Data generation, intended to be utilized in an established constitutive model, in support of technology development or evaluation of system behavior (i.e., practical use) is more appropriately aligned with the NE Industry Voucher Program.

Applications requesting neutron irradiation (test reactor) capability will only be considered for award if the nature of the proposed work utilizes a previously designed irradiation capsule or no capsule (i.e., pool access for gamma exposure, etc.) and adheres to the principles described in the preceding paragraph. In general, the use of the DOE Nuclear Science User Facilities (nsuf.inl.gov) is the preferred pathway for irradiation experiments.

Note that applications for isotope production will not be considered for award unless there is a clear indication that the focus of the underlying technology supports the production of nuclear fission energy (e.g., for commercial, space, or defense applications) or enhances the nuclear fuel cycle. The DOE Isotope Program (https://www.energy.gov/science/ip/isotope-rd-and-production-doe-ip) produces critical radioactive and stable isotopes in short supply and conducts R&D on new and improved isotope production and processing techniques. Fusion energy has a separate program, namely, Innovation Network for Fusion Energy (INFUSE). For more information about this program, please refer to: https://infuse.ornl.gov.

B. Eligibility Requirements and Certifications

Eligible Requester – An eligible requester is a business that (1) is majority (51%) owned by a U.S. citizen or lawfully admitted permanent resident alien, or a U.S.-based corporation; (2) is organized according to the laws of any of the 50 states, the District of Columbia, or any U.S. territory or possession; and (3) operates primarily within the United States of America.

Small Businesses – Extra consideration (see **Section E.4**) during the review process will be given to those companies who qualify as a small business [in addition to those qualities listed previously, means a small business concern as defined in Section 2 of Public Law 85–536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration].

Foreign Affiliation – Requesters who are owned, controlled, or influenced by a foreign government, agency, firm, or corporation, as per DOE Policy 485.1A[1] will be required to sign the DOE Standard Cooperative Research and Development Agreement (CRADA) as described in **Section C**. The transfer of

[1] https://www.directives.doe.gov/directives-documents/400-series/0485.1-APolicy-a/@@images/file

technology and data resulting from the work done under an NE Industry Voucher Award by any recipient to a foreign entity will be subject to U.S. Government export control laws and regulations.

Company Certifications – Requesters must certify that they will accept one of the NE Industry Voucher Program Agreements (e.g., CRADAs) and will provide the required 20 percent or more cost-share upon selection for a voucher award. Details on NE Industry Voucher Agreements can be found in **Section C** of this document. Further details on cost-share requirements can be found in **Section F**.

Eligible Types of Assistance – Assistance is intended to provide access to unique capabilities and facilities within the DOE complex. Vouchers cannot be used to obtain a service or use equipment that is available in the private sector.

National Laboratory Staff – National Laboratory staff are not eligible to apply to the NE Industry Voucher Program and should not be listed as co-applicants or co-principal investigators (PIs). Application materials must be prepared by the applicant, but assistance from the laboratory contact should be sought to vet feasibility and create a focused cost estimate.

Universities – Since vouchers are intended to utilize DOE laboratory infrastructure and capabilities, university professors or students are not eligible for award under the NE Industry Voucher Program and cannot receive funds from DOE under a voucher award. University staff or students may participate in a voucher on a voluntary, no-cost basis or if funded through the awardee's cost share.

C. Voucher Details

Funding – Vouchers are **NOT** financial awards made directly to applicants. Vouchers provide funding to a facility within the DOE complex to help eligible businesses overcome critical technology and commercialization challenges. The NE Industry Voucher Program is subject to annual appropriations by Congress. DOE anticipates a funding level for NE Vouchers of approximately $4M - $5M each fiscal year. Each NE Industry award is valued at approximately $50K - $500K, however, requests for awards larger than $500K may be considered in cases where there is a clear need involving a truly exceptional innovation or technology. A 20 percent cost share calculated based on the full project cost (the sum of the government share and the voucher recipient share equals the full project cost) is required.

Period of Performance – It is the intent of DOE that the voucher activities be completed within 12 months from the date the CRADA is executed.

Terms and Conditions – In most cases, NE Industry Voucher recipients will sign one of two non-negotiable CRADAs, as discussed below. NE is committed to reducing the burden and processing time needed for vouchers; therefore, terms and conditions in the CRADAs will not be negotiated apart from exceptional cases requiring alternate provisions as determined solely by DOE.

1. GAIN Small Business Voucher CRADA: Small Business/Non-Profit voucher requesters with **NO** foreign ownership/control/influence. The GAIN Small Business Voucher CRADA will be the agreement mechanism for requesters that qualify as small or non-profit entities as defined in **Section B** and are not determined by DOE to be owned, controlled, or influenced by a foreign

government, agency, firm, or corporation.[2]

2. DOE-Standard CRADA: Large Business and all eligible voucher requesters with foreign ownership/control/influence. The DOE-Standard CRADA will be the agreement mechanism for requesters that do not meet the requirements for small/non-profit businesses and/or are determined by DOE to be owned, controlled, or influenced by a foreign government, agency, firm, or corporation.[3]

Products embodying intellectual property developed with NE Industry Voucher Program assistance must be substantially manufactured in the U.S. Please refer to the specific CRADAs referenced previously for further details.

Voucher awardees will be the sole recipient of technology transferred to them as a result of this voucher work. Any transfer of technology to foreign entities requires specific authorization under federal export control laws and regulations including 10 CFR Part 810.

D. Key Dates – The following notional schedule is provided to help understand general time frames expected for the NE Industry Voucher Process

Starting from each quarterly due date:

- 0 weeks – 5:00 PM Eastern Time Due Date for quarter application submissions for review
- 6 weeks – Expected notification of selections
- 12 weeks – Planned finalization of statement of work, budget, and cost share
- 18 weeks – Expected finalization of agreements
- 19 weeks – Voucher work expected to begin

Quarterly voucher application due dates are expected to be January 31, April 30, July 31, and October 31 on an annual basis. If one of these dates falls on a weekend (Saturday or Sunday), the due date will be the following Monday. The voucher Request for Assistance (RFA) will remain open at all times for submission of applications, but review cycles will only be conducted according to the aforementioned notional schedule and associated due dates. **Note:** The schedule is dependent upon the Department receiving annual appropriations. Any changes to the standard schedule/process will be communicated on the GAIN website.

E. Merit Review Criteria

Requests for assistance will be evaluated in accordance with the criteria below. In addition to these criteria, other factors may be considered in selection of applications. During the review, factors regarding the appropriateness of the work under a GAIN voucher as well as alignment with DOE programmatic goals may be considered.

1. **Technical Merit (50 Points)**
    - Extent to which the requester has clearly identified the problem or challenges the company is facing in developing innovative nuclear energy systems and how the assistance

[2] https://gain.inl.gov/content/uploads/4/2022/10/GAIN_SmallBusinessVoucherCRADA_11.1.2018.pdf
[3] https://gain.inl.gov/content/uploads/4/2022/10/DOE-StandardCRADA_11.1.2018.pdf

from the host institution can assist in overcoming these challenges. (15 points)

- Extent to which the applicant's approach is realistic and feasible with respect to technical considerations and is appropriately aligned with the host institution's capabilities. (15 points)
- Extent to which the innovation/concept/technology will contribute in a significant manner in one or more of the following areas toward the deployment of advanced nuclear energy systems or components. Examples of improvements could include but are not limited to: (20 points)
    - Energy expansion and generation economics
    - Economic competitiveness (capital cost, operations cost, enhanced performance, accelerated deployment schedule, etc.)
    - Capability to penetrate non-electricity market
    - Enhanced safety
    - Reduced technical uncertainty
    - Reduced regulatory uncertainty
    - Improved management of spent nuclear fuel and high-level waste
    - Reduced proliferation risk
    - New processes or materials
    - New products or markets

2. Business and Market Impact (40 Points)

- Quality of the requester's plan to utilize the results to advance their nuclear energy innovation/concept/technology. Applicants must clearly state how the results of a successful voucher will enable them to overcome the stated technical hurdle and how it will contribute to their overall ability to achieve their goals. This should include a description of the specific impact and outcome that is anticipated as a result of the voucher. (20 points)
- Extent to which the innovation/concept/technology will contribute to the overall nuclear energy marketplace or state of technology development. (10 points)
- Extent to which the requester has a feasible plan for deploying the innovation/concept/ technology to the market. (10 points)

3. Qualifications and Experience (10 Points)

- Extent to which the requester is capable of leading a successful project and subsequent implementation or deployment with respect to qualifications and resources. (10 points)

4. Small Business Consideration

- Requesters who qualify as a small business (see eligibility requirements in **Section B**) will receive an additional five points of consideration that will be added to their overall score.

F. Cost-Share

Cost-share of no less than 20% is required for all voucher applications and awards. Requesters may

provide cost-share in the form of monetary or in-kind contributions. Allowable in-kind contributions include, but are not limited to, personnel costs; indirect costs; facilities and administrative costs; rental value of buildings or equipment; and the value of a service, other resource, or third-party, in-kind contribution.

Cost-share contribution must be reasonable, allowable, and allocable under the applicable Federal Cost Principles.[4] In addition, cost-share must be verifiable upon submission of the full application.

Requesters may use funding or property received from state or local governments to meet the cost-share requirement, as long as the funding was not provided to the state or local government by the Federal Government.

Sources that may **NOT** be used by the requester to meet their cost-share obligations include revenues or royalties from the prospective operation of an activity beyond the project period; proceeds from the prospective sale of an asset of an activity; federal funding or property (e.g., federal grants, equipment owned by the Federal Government); or expenditures that were reimbursed under a separate Federal Technology Office. For example, Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) funding cannot be used to provide in-kind or direct cost-share. Small businesses with SBIR/STTR funding can make a request for assistance under the NE Industry Voucher Program, however, SBIR/STTR awarded funds cannot be used to meet the voucher recipient's cost-share requirements.

Requesters may not use the same cash or in-kind contributions to meet cost-share requirements for more than one project or program.

G. Submitting the RFA

The NE Industry Voucher Program RFA and submission instructions may be found on the GAIN Website at https://gain.inl.gov/industry-support/gain-ne-vouchers/applying-for-a-voucher/.

Please do not provide any proprietary information with the request, or in supporting documentation or resumes. While proprietary information should be excluded from the application documentation, enough information should be included to allow for a full evaluation of the application. For example, the distinguishing features and planned uses for materials that are proposed for assessment or testing should be included in the application.

The anticipated host institution, capability, and host institution point of contact should be selected or identified within the electronic NE Industry Voucher application form at the time of application. Host institution staff should not be listed as co-PIs or co-applicants; DOE laboratory staff are not eligible to receive voucher awards.

Each eligible entity may submit only one application to this RFA per quarterly review cycle. It is the intent of NE to leave this funding opportunity open continuously for applications, and these applications will be reviewed for selection on the nominal quarterly dates identified in **Section D**. An applicant is allowed no more than $975,000 (not including cost-share) in active voucher funding awards resulting from this RFA. Once a current awarded project is complete, the applicant is eligible to receive additional voucher funding, if selected. Applications for additional voucher funding will be considered if an active voucher(s) for the

[4] https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-E

applicant is anticipated to be completed within three months of submission of the new application, as long as the applicant's total voucher funding remains below $975,000 with the new award.

Example 1 – Entity has no current active vouchers. Entity can apply for one voucher per cycle and awards may be made until the funding (not including cost-share) reaches the $975,000 active voucher limit. The limit on each voucher of approximately $500,000 (**Section C**) is still applicable.

Example 2 – Entity has three active vouchers each worth $300,000 for a total of $900,000. Option 1 – Entity would be eligible to apply for a $75,000 voucher. Option 2 – If one of the $300,000 vouchers is anticipated to be complete within three months of submission of the new application, then entity could apply for a voucher up to $375,000 (not including cost-share).

H. RFA Template

The RFA template is provided in **Appendix A**. Once completed, this document must be uploaded into the electronic NE Industry Voucher Application form available on https://gain.inl.gov/industry-support/gain-ne-vouchers/applying-for-a-voucher/ per the schedule provided in **Section D**. This also applies to the two-page (maximum) resumes (see **Section I**).

I. Resumes

Voucher applicants must submit resumes for the principal investigator and key project personnel as part of the application. These should be uploaded to the electronic NE Industry Voucher Application in **Section H**.

J. Current and Pending Support

Entities that have current and pending federal/DOE support (for example, but not limited to Advanced Reactor Demonstration Program (ARDP) (e.g., DE-FOA-0002271), Industry Funding Opportunity Announcement (iFOA) (e.g., DE-FOA-0001817), or other federal funding opportunities (e.g., ARPA-E, NE etc.)) may still apply for a voucher. However, additional clarification will be required to describe how the proposed voucher work is distinct from the other federally funded award. In such cases, applicants must add an appendix and include sufficient justification to clearly explain how the proposed voucher work scope is separate and not covered under the ongoing federal project agreement. In this appendix, the applicant must also include the funding office and program, award number, federal project manager, etc. to help expedite the voucher application review process. This appendix does not count against the voucher application length and should total no more than one page.

K. Award Announcement and Press/News Releases

By applying for a voucher, the applicant agrees that they will not use the name, logos, abbreviations, or trademarks of any National Laboratory, or Laboratory Management and Operating Contractor, or the United States Department of Energy or their employees, programs, or facilities in any promotional activity, such as news releases, investor information, or advertisements, without prior written approval.

Appendix A

U.S. Department of Energy Office of Nuclear Energy
Industry Voucher Request for Assistance

Requests for assistance are limited to five pages of text to address Sections I, II, and III. An additional two-page appendix may be used for supporting documentation, such as graphs, tables, and images. In addition, resumes for key personnel should be included to support Section III, Qualifications and Experience (See Appendix B and Section I for requirements). Please use 11.5 Times New Roman font and 1" margins.

Section I: Technical Merit

1. Company Introduction: Describe the mission and vision for your company. What differentiates your company from others in this market?
2. Problem Statement: Describe the challenge your company is facing and how this assistance, if granted, will help you overcome that challenge. Also describe why the national laboratory capability is necessary to address your challenge.
3. Work Scope and funding: Describe the national laboratory or partner facility capability you need and the work you would like to complete. Provide an estimate of the necessary funding for the work to be performed at the national laboratory along with a short basis for this estimate. It is advisable to consult with a point of contact at the laboratory or the GAIN office to assist with this information. Please include the following cost estimate template in your two-page appendix. The link for the template can be found at: Voucher Cost Estimate Template.

Voucher Project Schedule and Cost Estimate

			High-Level Task Breakdown				
Project Milestones	**Weeks or Months Duration (After Start of Project)**	**DOE Lab Cost by Task**	**Labor**	**Materials**	**Travel/Other**	**Company Cost Share by Task**	**Total Project Cost by Task**
Project Task A (Please list each task)	0-20	$5,000	$0	$0	$5,000	$10,000	$15,000
Project Task B	21-35	$5,000	$0	$5,000	$0	$25,000	$30,000
Project Task C	36-45	$250,000	$250,000	$0	$0	$35,000	$285,000
Project Task D	45-52	$90,000	$90,000	$0	$0	$17,500	$107,500
			$0	$0	$0		$0
			$0	$0	$0		$0
			$0	$0	$0		$0
			$0	$0	$0		$0
			$0	$0	$0		$0
TOTALS		**$350,000**	**$340,000**	**$5,000**	**$5,000**	**$87,500**	**$437,500**
			78%	**1%**	**1%**		

Column A. Enter project task list; this is a high-level task breakdown
Column B. Enter task duration; this can be in weeks or months (these are estimates)
Column C. Enter DOE cost estimates by task
Columns D-F. Assign DOE cost estimates to the specific task type
Column G. Enter Company cost share estimate by task
Column H. This column contains a formula and it will total for you.
Note. Company cost share amounts are not included in the High Level Task Breakdown.

4. Nuclear Energy Impact: Describe how this project, if successful, will contribute to advancing nuclear energy deployment in one or more of the following areas:
    a. Energy expansion and generation economics
    b. Economic competitiveness (capital cost, operations cost, enhanced performance, accelerated deployment schedule, etc.)
    c. Capability to penetrate non-electricity market
    d. Enhanced safety
    e. Reduced technical uncertainty
    f. Reduced regulatory uncertainty
    g. Improved management of spent nuclear fuel and high-level waste
    h. Reduced proliferation risk
    i. New processes or materials
    j. New products or markets.

Section II: Business & Market Impact

1. Use of Project Results: Describe how the results of the proposed assistance will enable technical advancement of your company's innovation, concept, or technology. Provide specific information on the degree of impact the project, if successful, will have on your company's products or services.
2. Market Analysis: Describe the expected impact on the broader market if the project is successful.
3. Deployment Approach: When and how will these new or improved products or services be introduced to the market or otherwise benefit your company?

Section III. Qualifications & Experience

List the key members of your company's leadership and technical team. Briefly describe their qualifications and experience.

Appendix B

Resume Requirements

Voucher applicants should submit resumes for the principal investigator and all key project personnel. Resumes must include the following information, at a minimum:

Resume Requirements	
Education & Training	**Provide name of institution, major/area, degree, and year for undergraduate, graduate, and postdoctoral training.**
Experience	**Beginning with the current position, list professional/academic positions in chronological order with a brief description.**
Additional Criteria	**There should be no lapses in time over the past 10 years or since age 18, whichever period is shorter.**