



REQUEST FOR INFORMATION

DE-SOL-0008318

**University, National Laboratory, Industry and
International Input on Potential Office of
Nuclear Energy Infrastructure Investments**

April 13, 2015

Office of Nuclear Energy

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1 Introduction

The mission of the U.S. Department of Energy (DOE) Office of Nuclear Energy (NE) is to advance nuclear power as a resource capable of meeting the Nation's energy, environmental and national security needs by resolving technical, cost, safety, proliferation resistance, and security barriers through research, development and demonstration (RD&D). NE's RD&D activities help resolve technical challenges thus enabling the deployment of new reactor and fuel cycle technologies that will support the current fleet of reactors and facilitate the construction of new plants.

Developing and maintaining a national RD&D framework to achieve NE's mission requires an integrated approach involving people, tools, facilities, and knowledge tied to strategic partnerships. Experimental infrastructure (i.e. tools and facilities) is a critical piece of this framework. However, these capabilities, especially radiological and nuclear facilities required to handle nuclear material, are expensive to build and maintain. Therefore, thoughtful management of new capability procurement is required, while also providing researchers an effective mechanism to obtain access to unique nuclear energy research facilities.

DOE currently solicits and awards general scientific infrastructure enhancements to universities and national laboratories, as well as university research reactor upgrades through an annual Scientific Infrastructure Support for Consolidated Innovative Nuclear Research Funding Opportunity Announcement. The awards made through this mechanism primarily focus on localized research and training needs; providing a single investment to procure the necessary infrastructure. Complementary to these efforts, there remains a need to identify, develop and maintain high priority national infrastructure supporting nuclear energy-related RD&D.

There is interest within the nuclear energy community in a number of potential national infrastructure areas with varying funding models. Example capabilities that have been brought to NE's attention include, **but are not limited to** (in no priority order):

- Dedicated High Performance Computing Capability;
- Powder Metallurgy coupled with Hot Isostatic Processing Scale-up Demonstration Facility;
- In-situ transmission electron microscopy with integrated ion beam irradiation;
- Low Power Critical Facility;
- Thermal Hydraulic Test Facility, and;
- Other high priority regional or national nuclear infrastructure capabilities.

2 Requested Information

DOE is seeking information, comments, feedback, and recommendations from interested parties to determine what capabilities supporting research, training and technology

demonstration are of highest interest to the nuclear energy research community. In addition to receiving feedback on the aforementioned capabilities, DOE seeks input on other high priority nuclear energy-related infrastructure needs including information on the potential benefit, location, funding model, and feasibility of establishing, maintaining, and operating such facilities. It is currently envisioned that, in general, supported facilities would become part of the Nuclear Science User Facilities, which provides access to national nuclear energy infrastructure through a competitive process or through full cost recovery mechanisms.

Replies to this request should follow the general organization of Section 2 of this RFI and information should be as succinct as possible. Respondents are encouraged to provide information on all parts of this RFI; however, not every part of the RFI need be answered in order to submit a response to the RFI.

2.1 Cover Page

Responses shall include a cover page containing the following information:

- RFI title and reference number
- Names, phone numbers, and e-mail addresses for the principal points of contact
- Company or affiliate name and address
- Date of submittal

2.2 Capability Selection

Clearly define your proposed capability and specifically identify why it is a priority for the nuclear energy community. Responses to this section of the RFI should address, but are not limited to:

1. What is the necessary capability and its essential features? If applicable, include manufacturer and model numbers.
2. Does a similar capability exist domestically (or internationally, if appropriate for consideration) and if so, why is additional investment required?
3. If there is an existing capability but it is currently inadequate, could it be refurbished or upgraded to meet the identified need?
4. What is the anticipated utilization of this capability by the host organization and as a user facility? Please specify in hours per year.
5. Why should the proposed capability be a priority investment for DOE-NE?

2.3 Research Areas

6. The new capability could be a facility or a specific instrument. Please use the following lists to determine the most appropriate category. If the capability does not fit with any of the identified categories, please specify its benefit to nuclear energy research.

Facility Categories	Instrumentation Categories
1. Accelerator Facilities	12. Chemical Testing
2. Fuel Development Facilities	13. Containment (Glove Boxes)
3. Hot Cell Facilities	14. Dimensional Examination
4. Neutron Beam Facilities	15. Electromagnetic Testing
5. Ion/Gamma Beam Facilities	16. Fuel Fabrication
6. PIE/Materials Characterization	17. Ion Beam Instruments
7. Radiochemistry Laboratories	18. Mechanical Testing
8. Reactor Facilities	19. Microscopes and Detectors
9. Sample Preparation Facilities	20. Neutron Beam Instruments
10. Special Laboratories	21. Photon Source Facility Instruments
11. Thermal-Hydraulic Facilities	22. Radiography/Imaging
	23. Sample Preparation Gear
	24. Shipping Containers (Casks)
	25. Spectrometry & Spectroscopy
	26. Surface Techniques
	27. Thermal Testing
	28. X-ray Diffraction Instruments

Functional Area

Primary	Secondary

7. In terms of relevance to NE’s mission, please identify which of the following objectives the proposed capability would support.

Primary	Secondary	DOE-NE Mission
		1. Improve the reliability and performance, sustain the safety and security, and extend the life of current reactors by developing advanced technological solutions.
		2. Meet the Administration’s energy security and climate change goals by developing technologies to support the deployment of affordable advanced reactors.

		3. Optimize energy and waste generation, safety, and nonproliferation attributes by developing sustainable fuel cycles.
		4. Enable future nuclear energy options by developing and maintaining an integrated national RD&D framework.
		5. Maintain U.S. leadership at the international level by engaging nations that pursue peaceful uses of nuclear energy.

8. In terms of overall NE-related research, identify which of the following research areas the proposed capability would support.

Priority	Research Area
	Structural Materials
	Nuclear Fuels (including cladding)
	Nuclear Systems Design Studies
	Power Conversion Systems
	Dry Heat Rejection Systems
	Process Heat Transport Systems
	Instrumentation and Controls
	Material Recovery Processes
	Waste Forms
	Safeguards and Security Technologies
	Used Fuel Disposition
	Safety and Risk Assessment
	Advanced Manufacturing Technologies
	Systems Analysis
	Space and Defense Power Systems
	Other (please specify:)

2.4 Capability Location

Some capabilities are one-of-a-kind while others are common among multiple locations and institutions. The following questions will help determine the extent of the need and the preferred location for a new capability.

9. What type of institution should host this new capability and why?
10. Where should this capability be located and why? Please specify the preferred institution or region(s) as appropriate. Preference should be given to regions with the most need or best synergy with existing capabilities.

2.5 Capability Funding Support

DOE seeks input related to potential funding models for initial and continued support of the proposed capability. While all options will be considered, those that do not result in an enduring mortgage to DOE are preferred.

The following questions are specific to the initial investment:

11. What is an estimated cost and schedule for establishing the capability?
12. What costs should DOE bear?
13. What costs should the hosting institution bear?

The following is specific to continued maintenance and operation of the capability:

14. Rank the following options in order of preference.

Preference	Annual Funding Support from DOE-NE	Duration (e.g., 5 years, 10 years, permanent)
	Operations and Maintenance Costs to support the capability	
	Pre-pay (or buy) some amount of the usage schedule for DOE-NE programs, ensuring continued operations.	
	Payroll support for operations and maintenance staff for the capability	
	Provide no-cost or low-cost access to the new capability for non-DOE users (similar to the current NSUF model)	
	Other (please specify:)	

2.5 Other Information

Provide any other relevant information you feel is important and not otherwise already covered.

3 Participant Eligibility to Respond to RFI

Information is being sought from educational institutions, National Laboratories, private-sector institutions, international research entities, and any other interested party.

4 Program Guidelines

This market research request is done under the Federal Acquisition Regulation (FAR), Parts 10 – Market Research and FAR subpart 15.201(e) – Requests for Information.

5 Intellectual Property Rights

Participants are advised that their RFI response package should be submitted without any restrictive markings. However, if restrictions are required in order to fully explain a response, the participant is responsible to mark the cover page and any and all submittal documents appropriately. Respondents are strongly discouraged from placing any restrictive markings on submissions as they may limit DOE's ability to use the submitted information.

6 Communications Protocol

Responses must be submitted through www.NEUP.gov to be considered. You must create an account to access the submission site. Submit electronic submissions through the “Applications” function at www.NEUP.gov. If you have problems completing the registration process or submitting your response, call 208-526-1507 or send an email to NEUP@inl.gov.

Participants are advised that any indication of interest, in the affirmative, is not meant to imply nor in any way impart an obligation on the part of the Government that an award will be forthcoming for the offered work or project.

7 Schedule

7.1 Submission Time and Date

The DOE will continually accept packages in response to this RFI No. DE-SOL-0008318. However to be considered for the 2017 grant opportunities a response will be required no later than **8:00 p.m. ET, May 13, 2016**. To be considered for the 2018 grant opportunities a response will be required no later than **8:00 p.m. ET, May 13, 2017**. To be considered for the 2019 grant opportunities a response will be required no later than **8:00 p.m. ET, May 13, 2018**.

This announcement does not impose any obligation on the Government nor does it signify any intent for a contract or other form of award.

8 Disclaimers

- a. DOE does not plan to send individual acknowledgements or replies to respondents to the RFI. However, DOE may conduct one-on-one meetings with entities that respond to this request if clarification or additional information is required to improve the DOE's understanding of the comments provided. If DOE decides to hold one-on-one meetings, applicable interested parties will be contacted. The decision to meet with a company one-on-one has no bearing on the worthiness of its RFI submittal or on any future offerings.
- b. This is a request for information only. It has no direct relation to other DOE Funding Opportunity Announcements or solicitations. DOE does not presently intend to solicit or award any kind of contract or financial assistance award; this RFI is issued only with the intent of obtaining information.
- c. Any response to this RFI is voluntary and does not commit to Government to any expense or obligation. This request does not impose any obligation on the Government or signify a firm intention to enter into a contract. No costs associated with responding to this RFI or participating in any subsequent meetings will be borne by the Government.
- d. DOE does not intend to publish the results of the responses to this RFI.