

**BATTELLE ENERGY ALLIANCE (BEA)**

**REQUEST FOR PRE-APPLICATIONS (RPA) NO. CROPCA-001-08**

SUBJECT:

ISSUE DATE: **12/15/2008**

PRE-APPLICATION AND PROPOSALS DUE DATE: **01/19/2009**

SUBCONTRACT ADMINISTRATOR:

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## 1. INTRODUCTION

This solicitation was prepared by the Battelle Energy Alliance, LLC (BEA), a Management and Operating (M&O) contractor for the United States Department of Energy at the Idaho National Laboratory (INL). The primary point of contact for questions regarding this solicitation is the Subcontract Administrator, Cindy Cropper, [Cindy.Cropper@inl.gov](mailto:Cindy.Cropper@inl.gov). Technical scope questions should be made using the question and answer feature on the RPA website accessible via the CAES home page located at [www.caesenergy.org](http://www.caesenergy.org).

The solicitation was prepared by the Center for Advanced Energy Studies (CAES) and is sponsored by the Department of Energy (DOE - aka the Department) Office of Nuclear Energy (NE). Under the direction of NE, CAES is responsible for the integration of university research with NE research and development (R&D) program mission and objectives. This solicitation is a component of the strategy being undertaken to achieve NE's R&D objectives.

The mission of the Office of Nuclear Energy is to lead the DOE investment in the development and exploration of advanced nuclear science and technology. NE promotes nuclear power as a resource capable of meeting the Nation's energy, environmental and national security needs by resolving technical and regulatory barriers through research, development and demonstration.

The NE University Programs (NEUP) goals and objectives are to:

- Assist in addressing technical nuclear energy R&D challenges
- Maintain the nation's leading position in nuclear energy R&D
- Advance the state of U.S. nuclear technology
- Improve the nation's nuclear science and engineering (NS&E)<sup>1</sup> infrastructure so the industry will be ready for future expansion.

This solicitation is a NEUP Request for Pre-Application (RPA) for R&D. The RPA shall apply a set of mandatory requirements and evaluation criteria to select a set of applicants who will be asked to submit a response to a subsequent Request for Proposals (RFP).

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1. In this context NS&E disciplinary areas include nuclear engineering, health physics, radiochemistry, nuclear chemistry and other closely related branches of higher education.

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In preparation for the R&D RPA, two NEUP workshops were held. Outcomes of the Office of Nuclear Energy, fiscal year 2009, University Program Workshop, August 19-20, 2008, were captured as Proceedings, and are available at <https://events.energetics.com/univworkshopaug08/reports.html>

Outcomes of the second online workshop, were captured in the form of Q&A and are available on the CAES web page, [www.caesenergy.org](http://www.caesenergy.org). These workshop products are important sources of background information on the R&D campaigns. You are encouraged to read and familiarize yourself with these documents before responding to the solicitation or entering the proposal submittal system (online).

You are invited to submit a pre-application to perform R&D in accordance with the requirements set forth in this RPA. Applicants can submit more than one pre-application for R&D. A standalone pre-application is required for each scope of work of interest. In response to this solicitation, CAES, on behalf of the Department, reserves the right to limit the number of requests for final proposals based on the availability of funds.

**NOTE:** *All information and instructions required to respond to this solicitation are accessible at [www.caesenergy.org](http://www.caesenergy.org). Applicants who participated in the NEUP Cyber Workshop may use their log-in credentials to enter the secure RPA website beginning at 8 a.m. December 15, 2008 MST. Others may request log-in credentials at [www.caesenergy.org](http://www.caesenergy.org) beginning at 8 a.m. December 15, 2008 MST. Applicants MUST submit their responses electronically. NO hard copy responses will be accepted.*

## **2. SCOPE AND OBJECTIVES**

The NEUP will fund R&D that facilitates achievement of NE programmatic objectives. The research needs and priorities have been grouped into campaigns for the Advanced Fuel Cycle Initiative (AFCI), the Next Generation Nuclear Plant (Gen IV), the Nuclear Hydrogen Initiative (NHI), the Light Water Reactor Sustainability (LWRS), and the Plutonium 238 (Pu238) Development programs.

Additionally, investigator-initiated, mission-specific applied R&D and basic nuclear science and engineering research activities are invited to this solicitation. This includes research that supports NE's mission -- it may not fully align with the initiatives and a program identified in this solicitation, but is critical to maintaining nuclear science and engineering. Examples of topics of interest are new reactor designs and technologies, advanced nuclear fuels, instrumentation and control/human factors, radio chemistry, nuclear waste management, and fundamental nuclear science.

The mission of the AFCI program is to enable the safe, secure, economic, and sustainable expansion of nuclear energy by conducting research, development, and demonstration (RD&D) focused on nuclear fuel recycling and waste management to meet U.S. needs.

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The Gen IV initiative is aimed at developing the technology and tools needed for implementation of the next generation of commercially available nuclear reactors and is divided into four primary areas: Methods, Materials, Heat Transport, and Fuel Development and Qualification Program.

The goal of the NHI is to demonstrate the economic, commercial-scale production of hydrogen using nuclear energy. NHI is developing electrochemical and thermochemical hydrogen production methods and the focus is on high temperature electrolysis and the sulfur based thermochemical cycles.

The LWRS, a collaborative R&D program being performed with industry R&D programs, provides technical foundations for licensing and managing the long-term, safe and economical operation of current nuclear power plants. DOE's program focus is on longer-term and higher-risk/reward research that contributes to the national objectives of energy security and environmental security.

Pu238 is an enabling isotope for NASA deep space missions. Pu238 is made by irradiation of either Np-237 or Am-241. The United States DOE is seeking to re-establish the capability to produce Pu238 using existing DOE reactors. The current DOE reactors are functioning as user facilities and careful optimization of irradiation requirements will be necessary to ensure that DOE can meet the Pu238 production goals as well as user facility requirements.

Detailed program information on the programmatic needs of AFCEI, Gen IV, NHI, LWRS and Pu-238 Development, as well as specific research needs by campaign and work scope are provided in the Technical Work Scope table provided at the RPA website: Access instructions are available at [www.caesenergy.org](http://www.caesenergy.org). The information includes scope, expectations and deliverables, and estimates for levels of funding and time of duration for R&D. The table includes a work scope titled "Investigator Initiated R&D." As described in the table, this category is reserved for investigators to propose innovative NE mission-related research that supports the campaigns. Each specified work scope provides the basis for a stand-alone R&D Pre-application submittal; and, has been assigned a Work Scope Identification Number.

### **3. ESTIMATED FUNDING**

Approximately \$13 million and up to \$50 million is expected to be available in fiscal year 2009 for new R&D awards under this solicitation announcement. The Department, through CAES, may issue awards in multiple phases throughout the fiscal year pending availability of funds. A minimum of approximately 5 percent of the total funding is targeted for investigator- initiated research.

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The actual level of funding in each research area depends on the fiscal year 2009 Appropriation for the Department of Energy NE R&D programs. Under the Department's current authorization level (\$13 million), some research areas (namely NHI, Pu238, and basic nuclear science and engineering R&D) do not have sufficient funds to award contracts. However, CAES, on behalf of the Department, is encouraging pre-applications in all areas to allow sufficient time for evaluation should additional funds become available. In the event that additional funds become available later in fiscal year 2009, the Department will request full proposals from highly-ranked pre-applications and make awards in accordance with the proposal review and evaluation process outlined in this solicitation.

#### **4. ELIGIBILITY INFORMATION**

The lead applicant must be a U.S. university or college. Collaborations between universities, and between universities and industry or national laboratories, are permitted. A maximum of 20 percent of an award can go to industry and national laboratories. Partnering with minority institutions such as Historically Black Colleges and Universities and/or minority serving institutions is encouraged. The following link provides the list of minority institutions: <http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>. Furthermore, including young researchers on application teams is encouraged.

#### **5. CONTENT OF R&D PRE-APPLICATION AND BASIS FOR AWARD**

5.1 Each applicant's R&D pre-application shall include:

- Commitment to Mandatory Requirements
- Commitment of Partners
- Vita for Principal Investigator
- Pre-Application Narrative.

You may input these pre-application elements on the NEUP R&D Pre-Application Form provided at the RPA website: Access instructions are available at [www.caesenergy.org](http://www.caesenergy.org).

##### **5.1.1 Mandatory Requirements**

A mandatory set of (go/no-go) requirements is provided below as Attachment 1. The lead university or college is required to obtain its institutional commitment, as well as the commitment of each collaborating organization, to each of the specified mandatory

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requirements. Only pre-applications that accept these mandatory requirements shall be eligible for continued evaluation.

5.1.2 Collaboration Commitment

Each institution identified in the RPA as a team member shall be identified in the pre-application, with their commitment made to collaborate in the RFP process, and agree to the mandatory requirements.

5.1.3 Vita

A two page vita in .pdf form shall be provided for the principal investigator from the lead college or university. It should include his/her relevant: credentials, experience, 5 most recent publications or commensurate accomplishments.

5.1.4 Pre-application Narrative

Applicant shall provide a narrative in .pdf form that addresses the specific information below:

- Title of Project
- Technical Work Scope Identifier No. (enter the number that appears in the Technical Work Scope Table for the specific scope of work)
- Name of Project Director/Principal Investigator(s) and associated organization(s)
- A summary of the proposed project, including a description of the project and a clear explanation of its importance and relevance to the objectives covered by this RPA
- Explain the contribution that will be made by the collaborating organizations
- Explain the importance and relevance of the proposed work to the objectives covered by this work scope area
- Logical path to work accomplishment
- Deliverables and outcomes the R&D will produce

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- Timeframe for execution of proposed scope (specify if the R&D is for a 1, 2 or 3 year period)
- Estimated cost of proposal (order of magnitude).

**5.2 Evaluation Criteria**

Selection of universities and colleges to respond to the RFP shall be based on how well, in CAES' judgment, on behalf of the Department, the pre-application meets or exceeds the pre-application evaluation criteria. The evaluation criteria and weights for the R&D portion of this solicitation are provided below as Attachment 2. In accordance with the evaluation criteria and available funding, NE will make the final selection of pre-applications that are invited to respond to the RFP.

**6. APPLICATION AND SUBMITTAL INFORMATION**

CAES, on behalf of the Department, reserves the right to amend the solicitation schedule as needed.

**6.1 Solicitation Schedule**

|                                                                 |                   |
|-----------------------------------------------------------------|-------------------|
| Issue Request for Pre-application                               | December 15, 2008 |
| R&D Pre-Applications Due                                        | January 19, 2009  |
| R&D Pre-Application Selection Review Completed and RFP Released | February 4, 2009  |
| R&D Full Proposals Due                                          | March 9, 2009     |
| R&D Selection Review Completed                                  | May 1, 2009       |

**6.2 R&D Pre-application Due Date**

In accordance with the schedule above, R&D pre-applications are due by 12:00 a.m. January 19, 2009. Submittals to the R&D solicitation MUST be made electronically by using the "Submit pre-application for review" option on the R&D Pre-application form. Please read the instructions on the form carefully. R&D pre-applications not submitted via this option will be treated as incomplete and will not be evaluated. If you run into technical difficulties during the upload process after business hours on the 19th, you can email a copy of your pre-application and other required information to [Cindy.Cropper@inl.gov](mailto:Cindy.Cropper@inl.gov) before the midnight deadline and the pre-application will be considered responsive.

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**6.3 Late Pre-applications**

Pre-applications received after the designated date and time, i.e., late, will be treated as nonresponsive and returned without opening. Extension of the R&D pre-application due dates shall be at the sole discretion of CAES, on behalf of the Department.

**6.4 Submittal Content and Format**

The information required for each R&D Pre-application submittal is captured on the R&D Pre-Application form. The key information captured on the form is described below:

| Item                      | Description                                                                                              |
|---------------------------|----------------------------------------------------------------------------------------------------------|
| Pre-Application Narrative | Size 11 font minimum; Three single-spaced pages maximum; One-inch margins all around minimum; .PDF only. |
| Mandatory Requirements    | Electronic submittal of the pre-application form.                                                        |
| Commitment of Partner(s)  | Electronic submittal of the pre-application form.                                                        |
| Vita                      | Size 11 font minimum; Two single-spaced pages maximum; One-inch margins all around minimum; .PDF only.   |

**7. R&D PRE-APPLICATION INSTRUCTIONS**

- 7.1 Submit in writing (electronically) any administrative questions or requests for additional information on this solicitation to the BEA Subcontract Administrator identified herein. Questions should be submitted to [Cindy.Cropper@inl.gov](mailto:Cindy.Cropper@inl.gov). Technical scope questions should be made using the question and answer feature on the CAES home page located at [www.caesenergy.org](http://www.caesenergy.org). CAES will provide a response to substantive inquiries by restating the question and furnishing a response to all potential applicants by posting the question and response on the RPA web site.
- 7.2 Pre-applications that fail to provide ALL items and quantities specified in this RPA may be deemed non-responsive in their entirety, and will not be invited to submit a response to the RFP.

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**Attachment 1**

**DOE NE University Programs Pre-Application Mandatory Requirements**

| <b>Requirement</b>                                             | <b>Description</b>                                                                                                                                                         | <b>Evaluation</b> |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Commitment to Financial and Administrative (overhead) guidance | All participating organization's adders are capped at grant levels. Funds for industrial and national lab partners are not taxed with the lead organization's burden rate. | Pass/fail         |
| Commitment to reporting and budget requirements                | Commitment to quarterly billing. Commitment to quarterly reporting to National campaign director; and reports approved by Campaign director; Annual Report.                | Pass/fail         |
| Commitment to Comply with Quality Assurance Requirements       | The College or University is required to acknowledge that it will comply with general QA requirements. Additional explanation is provided below.                           | Pass/fail         |
| Infrastructure                                                 | Infrastructure (e.g., equipment, and facilities) capabilities exist and are currently accessible to execute the proposed scope of work.                                    | Pass/fail         |

Note 1: If the lead institution has a current R&D contract in place with BEA and is awarded a R&D contract in response to the RFP, then the NEUP R&D award will be added to the existing contract.

Note 2: If an applicant proposes work scope to be conducted at a DOE facility, the work performed at DOE facilities shall be conducted in accordance with 10 CFR 851, Worker Safety and Health Program requirements.

Note 3: Applicants that progress to the full proposal stage will be required to agree to the terms and conditions of the Standard Research Subcontract.

**Quality Assurance Requirements**

Institutions will be expected to follow quality assurance (QA) principles and requirements in conducting R&D activities. The integrity of R&D products and their usability by NE is predicated on meeting QA requirements as they apply to a specific scope of work and associated deliverables. In most cases, an institution's process for peer review in support of publishing research results will serve as a basis for QA requirements; however, there will be some instances where additional QA requirements will be needed.

Before the RFP is released, the QA requirements for each specific work scope will be defined and added to the Technical Work Scope Table that describes each specific scope of work associated with this solicitation. Institutions will be able to adequately factor these requirements into their R&D final proposal strategy, and include compliance costs as part of their response to the RFP.

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While QA requirements are not new to universities and colleges, it is recognized that familiarity with NE programmatic-specific QA requirements will vary. Therefore, as needed, during the RFP process CAES will provide assistance in interpreting QA requirements for a specific work scope and in developing options to meet those QA requirements.

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**Attachment 2**

**DOE NE University Programs Pre-Application Evaluation Criteria**

| <b>Criterion</b>                                                                                                                                                                                                                                                                                                                                              | <b>Description</b>                                                                                                                                            | <b>Weight (Percent)</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Scientific Merit                                                                                                                                                                                                                                                                                                                                              | Advances the state of the knowledge in the relevant program element(s).                                                                                       | 10                      |
| Mission-relevant and Technical Merit <sup>1</sup>                                                                                                                                                                                                                                                                                                             | Mission-relevance; Aligned with technical objectives; practicality of scope with respect to specified funding range for work scope and period of performance. | 50                      |
| Team Qualifications                                                                                                                                                                                                                                                                                                                                           | Relevant credentials, publications, experience, and past accomplishments of principal investigator and collaborators.                                         | 20                      |
| Research Plan                                                                                                                                                                                                                                                                                                                                                 | Logical path to work accomplishment.                                                                                                                          | 10                      |
| R&D Resources and Capabilities                                                                                                                                                                                                                                                                                                                                | Demonstrate that labor and non-labor resources are adequate to accomplish the proposed work scope.                                                            | 10                      |
| 1. Mission Relevant and Technical Merit: The technical section of the application will clearly define the research being proposed and its relationship to the relevant program element(s). This criterion will consider the technical merit of the application including proposed technical objectives and deliverables and the likelihood of achieving them. |                                                                                                                                                               |                         |