**MARVEL Preliminary Engagement Questionnaire**

**Background**

The U.S. Department of Energy Office of Nuclear Energy (DOE-NE) Microreactor Program (MRP) is supporting the development and construction of the Microreactor Applications Research Validation and Evaluation (MARVEL) microreactor at the Idaho National Laboratory (INL) in collaboration with Los Alamos National Laboratory (LANL) and Argonne National Laboratory (ANL). This project aims to accelerate the development and deployment of microreactor technologies by reducing technical risks and providing operations experience for end users. DOE is pursuing an aggressive construction schedule, planning to have the reactor operational by the middle of 2024.

The MARVEL microreactor will generate 100 kW (85 kW nominal) of thermal energy using nuclear fission, supporting electricity production via up to 4 Stirling engines that produce ~5 kWe apiece, and industrial process heat loops at temperatures between 400-450°C. To support test loads, a conceptualized microgrid to be installed by INL will incorporate grid connections, energy storage, and up to 30 kWe of solar photovoltaic and 15kWe wind generation as well as ~320 kW-hours battery storage. The microreactor and microgrid will be installed at INL’s Transient Reactor Test (TREAT) Facility. The MARVEL microreactor is built with an emphasis on the utilization of proven technology to the extent possible. By constructing in an existing facility and using “off the shelf” components where possible, the project’s costs and construction timeline are minimized, allowing industry to start testing applications prior to the availability of larger, commercially viable small- and micro-scale reactors.

**Preliminary Discussion Request**

INL and MRP are seeking commercial and other partners to utilize the MARVEL microreactor itself as well as heat and electricity generated on a microgrid to conduct live testing and demonstrations of their novel technologies, equipment, and processes. Note that in general, research and development that alters the MARVEL safety basis will not be considered. Microgrid infrastructure will allow for the utilization of nuclear energy, renewable energy, inverter controls and island functions, load following, battery storage and charging, and industrial heat to generate a realistic nuclear microgrid test environment.

Early engagement is especially important given the project’s planned near-term availability, as it allows for adjustment of capabilities to meet partner needs. Interested parties should contact Lori Braase at lori.braase@inl.gov or John Jackson at john.jackson@inl.gov . Requested information[[1]](#footnote-1) to support initial discussion/engagement should include answers to the following:

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| 1. ***What is your company name?***
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| Company Name:   |
| Address: |
| City | State: | Country: |
| Zip/Postal Code |  |  |
| Parent Company if different from above: |
| 1. ***Briefly describe what your company does (1-2 paragraphs).***
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| 1. ***Describe the technology you wish to demonstrate.***
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| 1. ***Do you require process heat, electricity, or both?***
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| 1. ***What are the thermal power and temperature requirement for your technology?***
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| 1. ***What are the power and voltage requirements for your technology?***
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| 1. ***What is the minimal required operational time window at steady state for the success of your demonstration/experiment?***
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| 1. ***Do you require steady-state operation for the duration or is intermittent operation allowable***
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| 1. ***What are the approximate physical characteristics of your test/demonstration article (e.g., size, weight, portability)?***
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| 1. ***Are you seeking only specific data from the operation of MARVEL, the microgrid, or both?***
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| 1. ***If so, what data are you requesting***
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| 1. ***Does your request require the operation of MARVEL outside its nominal operating envelope?***
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| 1. ***Do you need access to the microreactor or its control system for your demonstration/experiment?***
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| 1. ***Does your experiment require the installation of something on the reactor?***
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| 1. ***Do you need access to the microgrid or its control system for your demonstration/experiment?***
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| 1. ***Does your experiment require the installation of something in the microgrid?***
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| ***Technical Point of Contact*** |
| First, Last Name: | Title: |
|  | Phone: | Email: |
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1. The MARVEL Team can accommodate non-disclosure agreements (NDAs) as necessary. If an NDA is desired, please let us know. [↑](#footnote-ref-1)