

REQUEST FOR INFORMATION (RFI)
ONR RFI Announcement 12-RFI-0009

Office of Naval Research Ship Systems and Engineering Research Division (331)

1.0 DISCLAIMER

1.1 This announcement constitutes a Request for Information (RFI) for the purpose of determining market capability of sources or obtaining information. It does not constitute a Request for Proposals (RFP), a Request for Quote (RFQ) or an indication that the Government will contract for any of the items and/or services discussed in this notice. Any formal solicitation that may subsequently be issued will be announced separately through Federal Business Opportunities (FedBizOpps). Information on the specific topics of interest is provided in the following sections of this announcement. Neither ONR nor any other part of the federal the government will be responsible for any cost incurred by responders in furnishing this information.

2.0 PROGRAM BACKGROUND

2.1 Hybrid Energy Storage Modules (HESM) with high power and energy densities, high rate capability, scalable to all power levels, will maximize performance, enhance fuel efficiency and enable future high power weapons and sensor systems on legacy and next generation vehicles and platforms. This capability to store power dense electrical energy having variable charge & discharge rates in modular-reconfigurable packages is projected to extend fuel efficiency in forward operating bases and military platforms, while providing robustness and easy maintenance. To surmount these challenges, a joint ASD(R&E) and ARPA-E program was initiated. To date, this program has established development tracks across DoD including tactical, aircraft and large electric architectures. These tracks provide the potential to improve fuel efficiency in the battlefield, improve generator reliability, and provide continuous pulse and fuel efficient operation.

2.2 As part of this program, each development track is presently establishing a basis of understanding and benefit of HESM operation in a military environment as well as metrics for future sub scale demonstrations to evaluate the technology and mitigate medium level program risks.

3.0 SPECIFIC INFORMATION OF INTEREST

3.1 This RFI is soliciting information that could be used to develop this basis of understanding and benefit of HESM operation in a military environment as well as metrics for future sub scale demonstrations in the following areas.

3.1.1 Aircraft HESM Systems: This track serves aircraft utilizing electric actuators to maintain optimum flight control. The energy storage technology is intended to buffer high transient conditions normally mitigated with the platform generator. The intent is to increase overall generator reliability and enable future platform pulse load capability.

3.1.2 Large Power HESM Systems: This track serves platforms or applications utilizing large distributed electrical architectures with continuous weapons and sensor pulsed loads or high transients due to alternative energy integration. This technology will also enable high energy efficiency system operating configurations

3.2 Information which this RFI specifically requests includes:

- High power and energy based energy storage subsystems at 1KVDC, including but not limited to high-rate capable batteries, capacitors, flywheels and superconducting magnetic energy storage (SMES)
- Energy storage design approaches supporting safety, non-propagation and thermal management without affecting packing density
- Energy storage approaches supporting high rates of charge and discharge, including load buffering and generator load leveling under highly transient operations
- Energy storage systems capable of high slew rates and extremely rapid response under instantaneous step and drop load conditions
- Intermediate storage systems to support directed energy weapons and high power sensors
- Energy storage interfaces to connect 1KVDC to electrical architectures including 450VAC, 4160VAC, 6KVDC
- High power density, high slew rate, and lightweight interface and fault isolation methodologies to connect energy storage to electrical architectures including 270VDC, and 200VAC L-L (400Hz, 3 phase)
- Energy storage fault current limiting protection that is autonomously resettable to 270VDC
- Autonomous operation, load planning and dynamic re-planning, command and control, and multi-device coordinated operations and controls for energy storage systems
- Approaches that support commonality and reduced cost with compatible footprint and density to state of the art storage devices
- Existing or planned industry standards and specifications for use with construction, installation, or operation of energy storage systems

4.0 SUBMISSION INSTRUCTIONS and FORMATTING REQUIREMENTS

4.1 ONR is seeking from responders, content in a briefing or presentation package format on one or more aspects of the technology areas outlined above in section 3.1. Of particular interest would be (1) those specific areas in which industry leaders are expending their own R&D funds in the expectation of technological advancement; and, (2) recent breakthroughs or significant improvements in scientific subjects in the department's areas of responsibility of which the Navy may not already be cognizant. The briefing materials solicited should offer insights into current and projected industry achievements in the areas identified in section 3.1. This RFI provides an opportunity for companies to focus on their own product or process successes and also to have the option to highlight the overall advancements in the field to connect work to those reasonably anticipated to be reached within the next three years that should show commercial viability and community acceptance in the future thereafter. Emphasis on individual company solutions and products may be provided in the information provided, but should focus on technological basis and not sales literature or prepackaged solutions. It is desired that approaches offer superior energy storage module system and subsystems density and performance rather than utilizing current state of the art Valve-Regulated Lead Acid batteries, and potentially superior results utilizing current state of the art Li-ion batteries. Comparison and justification of benefits of next-generation technology should offer a basis in terms of current technology that is considered state of the art.

4.2 It is preferred that information provided be nonproprietary and focus on overall trends and technological advancement. However, information papers with company-sensitive data and concepts will be accepted, and the Government will respect restricted data markings. Classified material will not be accepted. The information paper should be limited to MS PowerPoint style presentation materials, and key technologies should be displayed in a quad chart format indicating salient points. It is anticipated that the papers received will reflect the best available technology assessments from those companies, universities and other research entities that are particularly knowledgeable in the fields of large-scale energy storage systems. Because of the multiphysics and systems approaches defined in section 3.0, consolidated technology assessments from groups of performers are welcomed, so long as the basis of technology and key components are fully depicted. The DoD will analyze the information papers received and reach its own independent conclusions.

4.3 Information papers should be prepared and submitted by **21 SEPTEMBER 2012**. However, late received papers will be reviewed as time allows. Submissions will not be returned.

4.4 Information papers must be submitted in hard copy or by email to the Program Officer listed in section 5.0.

5.0 QUESTIONS AND POINTS OF CONTACT

Questions regarding this announcement shall be submitted in writing by e-mail to the following personnel:

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