

		Robust Energy Sources for Intelligence Logistics In Extreme Novel and Challenging Environments (RESILIENCE)						
		BAA 20-02						
		NOTICE: IARPA will accept questions until October 19th						
		Industry Questions and Government Answers -						
Question number	GENERAL INSTRUCTIONS	Industry Questions	Paragraph & Page #	Government Responses	Change to BAA (Yes/No)	Paragraph & Page #		
Question number	Section 1 - TECHNICAL PROGRAM OVERVIEW				Change to BAA (Yes/No)	Paragraph & Page #		
Question 1	Round 1	The BAA says no internal combustion engine (ICE). I wonder if a solid oxide fuel cell (SOFC) is considered and ICE since a SOFC could consist an internal burner	Page 6	Fuel cells are in scope, provided that they do not comprise a component that is specifically out of scope per section 1.C.4 of the BAA. A heat source for temperature control of a solid oxide fuel cell does not constitute an internal combustion engine.				

Question 2

Round 1

Would like some clarification on the meaning of self-contained, which was described in the presentation as: "No external equipment, addition of electricity or fuels, or other external inputs." For the case of a fuel cell, would air count as an external input? That is, if we built a system that contained all of the gas handling equipment necessary to handle taking in outside air and passing it through a fuel cell, such that the fuel cell only has a positive and negative terminal for external connections, would this be satisfactory want to differentiate between solutions that carry oxidant on board from solutions which take in air from the surroundings. This would be for Track 1.

Air at ambient temperature and pressure does not count as an external input. As noted, all equipment needed for operation (e.g. compression or gas conditioning equipment) will be considered for energy density and power density measurements.

Question 3

Round 1

We developed a technology based on thermionics that has 10X the efficiency of “historically inefficient” thermionic generators making it competitive with batteries, ICE generators and fuel cells. It is similar to fuel cells in that it converts fuel to electricity with a silent solid state architecture (not moving parts other than a fuel pump if using liquid fuel (but fuel pumps can be avoided if using compressed gas like hydrogen, propane, natural gas etc.) but instead of chemically processing the fuel, the fuel is combusted.

From a technical requirements perspective it seems like this may be of interest to you but the BAA doesn’t mention thermionics as a

The BAA invites proposals to all types of energy storage and power systems, not just batteries or fuel cells. All proposed technologies must meet the metrics listed in Section 1.E and must not comprise out-of-scope characteristics in Section 1.C.4.

		<p>technology</p> <p>Are you only interested in batteries and fuel cells?</p>					
Question 4	Round 1	<p>Is a US University eligible to be a prime recipient? I ask because of the sentence "The Prime contractor must be a U.S. company on the top of page 18 of the BAA</p>	Page 18	<p>Yes, a US University is eligible to be a prime recipient.</p>			
Question 5	Round 1	<p>We are developing a structural battery that can increase the energy density by up to 30% at the system level without altering the battery chemistry. Currently, we focus on the further development of the technology for Aerospace including the solar-powered perpetual flying UAV.</p>		<p>Structural batteries, or any other power solution, are in scope provided they can meet the metrics listed in Section 1.E.</p>			

		Are structural batteries within the scope of the BAA?					
Question 6	Round 1	Are maritime/undersea energy sources in scope for the RESILIENCE BAA?		Per section 1.C.1, "The objectives of the program, as stated in the metrics, include performance and properties of power solutions that can be used for multiple applications; no particular form factor is specified nor are any particular devices to be powered envisaged." In the case of undersea applications, no external inputs are permitted, such as water.			
Question 7	Round 1	Technologies to retain cell charge could potentially be integrated into a battery pack with very low SWAP (Size Weight and Power) to achieve the RESILIENCE program objectives specifically in Track 2. One example is the use of thermoelectric generators (TEG's) which have doubled in		Proposals to the RESILIENCE BAA may include batteries (primary or secondary cells), fuel cells, supercapacitors, or other solutions that convert some form of energy to electricity. Integrated power systems are within the scope of the program, provided the target metrics of the program are achievable with the proposed integrated power system.			

	<p>efficiency in recent years and may have application at the battery pack level but not the cell level. All of the RESILIENCE performance objectives generally appear to apply at the cell level, however creative results that meet the objectives may be obtained by integrating technologies at the battery level. Would the application of TEG's, or other battery pack level technologies be allowed in consideration of the RESILIENCE objectives which appear to be exclusively at the cell level? B) If the TEG's were integrated into a single cell that was part of a pack, and only 1 TEG-enabled "charge retention" cell was needed per some number of cells within a pack, would that be seen as compatible with</p>					
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		<p>the RESILIENCE objectives?</p>					
<p>Question 8</p>	<p>Round 1</p>	<p>A quote from the Phase I section of the BAA says “a successful Phase 1 deliverable could comprise 1) a coin cell, 2) a description of the mass and volume of the cathode, anode and electrolyte contained within, and 3) a mathematical model describing how the new cathode and electrolyte’s measured performance would be used in a pouch cell that would meet all of the performance metrics for Phase 1 when packaged.” Does this mean that for Phase I we just have to demonstrate a simple</p>		<p>Any mathematical model deliverable in Phase 1 must credibly describe how the offeror's delivered power solution can meet all the related metrics in Section 1.E when packaged.</p>			

		<p>coin cell of a battery formulation (anode, cathode and electrolyte) that has the potential, based on our mathematical models, to meet the Phase I requirements when packaged? For example, we don't actually have to meet the Phase I requirement 600 Wh/kg in the actual coin. This can't be as trivial as a coin that weighs 1 gram with stored energy of 0.6 Wh, which would result in a ratio of 600Wh/kg (the "mathematical model"), including packaging.</p>					
<p>Question 9</p>	<p>Round 1</p>	<p>We noted that solutions involving radioactivity were out of scope: more generically, would the program consider power solutions that make use of temporarily activated nuclei to store and release energy as</p>		<p>No, IARPA will not consider any solutions involving radioactivity. If temporarily activated nuclei were employed to make a power solution, and the final deliverable did not emit ionizing radiation upon delivery for test and evaluation, the power solution would be considered in scope.</p>			

		opposed to classical radioactive decay?						
Question 10	Round 1	What does 'scale' for Phase 3 mean? Does "scale to prototype required for Phase 3 of the program" (as stated in the Phase 2 section of BAA) mean you are expecting more than a single cell with positive and negative terminals charged and discharged in a thermal chamber?	Page 5		Scale for Phase 3 means that power solutions must meet all Phase 3 metrics. Per Section 1.C.2, deliverables for Phase 3 have no specific voltage requirements or optimum size (mass or volume), provided that they meet program metrics.			
Question 11	Round 1	Metrics included in Tables 1 and 2 provide a maximum unit temperature during operation of 120°Celsius for Solution Tracks 1 and 2. Can you confirm 120°Celsius (not Fahrenheit) and clarify that this value represents a maximum operating temperature parameter only and is not a target performance objective?			The metrics regarding temperature in Tables 1 and 2 are stated in Celsius and are maximum operating values. Notional temperatures for testing are provided in Section 1.D.			

<p>Question 12</p>	<p>Round 2</p>	<p>The BAA calls for a 1-pg summary in section 2 of the technical proposal for a single technical track. Pages 22-23 detail items A-E that must be included in the 1-pg technical summary for track 2, however in all our previous IARPA proposals the technical summary was 8-9 pages to cover the same level of detail in the summary. In order to meet the format requirements and incorporate elements A-E, can IARPA extend the page limit of the summary to 8 or 9 pages instead of 1-pg?</p>		<p>Per BAA amendment 1, 4.B.1.b on page 22, The Summary for Track 1 is limited to 5 pages; The Summary for Track 2 is limited to 5 pages; The Summary for Track 1 and 2 combined is limited to 10 pages.</p>		<p>4.B.1.b on page 22,</p>
<p>Question 13</p>	<p>Round 2</p>	<p>We need additional clarification on test articles deliverables for Track 1, Phase 3 Prototype. Phase 2 allows delivery of pouch cell as a test article. See excerpt from BAA 1.C.2. "As a representative example,</p>		<p>Yes.</p>		

		<p>a single pouch cell without any attached power electronics that meets all Phase 2 metrics listed would be compliant”.</p> <p>Can a pouch cell be compliant with Phase 3 as well?</p>						
Question 14	Round 2	<p>We have been contacted by multiple parties to participate as subcontractors for this solicitation. Is there a restriction in participating in multiple responses?</p>			<p>Section 3.A.2 of the BAA states that “organizations may participate as a subcontractor in more than one submission to the BAA.” A subcontractor may participate in multiple submissions.</p>			
Question 15	Round 2	<p>I would like to know if the University of Michigan Energy Institute (UMEI) Battery Lab would qualify as an independent performance validation partner.</p>			<p>No. Per Section 4.A, page 20, the US Army Combat Capabilities Development Command - Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (DEVCOM C5ISR) Center will be supporting Test and Evaluation activities for contracts awarded under this program.</p>			

<p>Question 16</p>	<p>Round 2</p>	<p>My company is considering applying as a sub-contractor with two separate companies. We plan to propose two completely separate technologies (different anode/cathode pairs). Is this allowed?</p> <p>If we do apply, can we have the same PI on both applications?</p>		<p>Yes. Offerors may apply as prime contractors or sub-contractors on multiple applications. Teaming combinations are not restricted unless otherwise described in the BAA.</p>		
<p>Question 17</p>	<p>Round 2</p>	<p>Will the RESILIENCE program fund just batteries? Will fuel cell-battery hybrid system be considered?</p>		<p>The BAA invites proposals to all types of energy storage and power systems, not just batteries or fuel cells. All proposed technologies must meet the metrics listed in Section 1.E and must not comprise out-of-scope characteristics in Section 1.C.4.</p>		
<p>Question 18</p>	<p>Round 2</p>	<p>We have some questions about how we might best respond to the BAA, can we setup a quick call to discuss?</p>		<p>No. Unfortunately, IARPA can only respond to questions in writing through the beta.sam.gov website during source selection.</p>		
<p>Question 19</p>	<p>Round 2</p>	<p>When is the first round due to IARPA for the Resilience effort? We only see the 17 November due date—is</p>		<p>Per the BAA overview on page 1, the proposal due date for the initial round of selections is November 17, 2020, 4:00 PM EST. Only the Technical</p>		

		<p>this for just the technical and ROM submission?</p>		<p>Volume is required with the initial submission. If the proposal is selected for negotiation, the contracting officer will request the detailed cost proposal. (See BAA section 4.B.2 and 5.B).</p>			
<p>Question 20</p>	<p>Round 2</p>	<p>We are interested in a hybrid solution that includes "Fuel Cell+Battery+Power Electronics," that we will utilize the state-of-the-art battery to achieve the goal. Will this kind of hybrid solution be considered/encouraged to submit for this program to further increase the power density?</p>		<p>Proposals to the RESILIENCE BAA may include batteries (primary or secondary cells), fuel cells, supercapacitors, or other solutions that convert some form of energy to electricity.</p> <p>Integrated power systems are within the scope of the program, provided the target metrics of the program are achievable with the proposed integrated power system.</p>			
<p>Question 21</p>	<p>Round 2</p>	<p>What technology readiness level are you looking for?</p>		<p>Offerors may propose technology at any technology readiness level, provided that it can meet the metrics described in Section 1.E.</p>			
<p>Question 22</p>	<p>Round 2</p>	<p>What is required in terms of teaming? Are you only interested in teams that put together programs that can</p>		<p>Proposals to the RESILIENCE BAA must meet all the related metrics in Section 1.E for the relevant track. Teams must demonstrate the ability to meet</p>			

		address all the issues laid out in the BAA? Or is there any interest in developing solutions for smaller chunks of the program?		metrics during all phases of the program.			
Question 23	Round 2	If a secondary battery is proposed for Track 1 will charging be allowed post shipment at the testing facility? If so will it be upon receipt or will it be after the storage period and immediately prior to testing?		Per Section 1.D., Test 1.1 pages 7-8 of the BAA, the testing protocols described are notional. If there are testing considerations specific to an Offeror's solution that may be incompatible with the notional testing protocols described, these must be described in the Offeror's proposal. Charging a battery upon receipt for Test and Evaluation is an acceptable proposed change to Track 1 notional testing protocols.			
Question 24	Round 2	Is a single cell acceptable for the packaged power solution for Track 1?		The BAA invites proposals to all types of energy storage and power systems, including a single cell as a packaged energy solution. All proposed technologies must meet the metrics listed in Section 1.E.			
Question 25	Round 2	You have a maximum battery size and weight, which I interpret to mean we can deliver batteries of any size that are below the maximum		Per the BAA section 1.E, there is only a maximum volume and mass constraint on power solutions. No particular size is considered optimal, and there			

		<p>but achieve the program metrics (knowing that generally the energy density increases with size). Is that correct, or should we be trying to get as close as possible to the maximum size without going over?</p>		<p>is no minimum volume or mass.</p>			
<p>Question 26</p>	<p>Round 2</p>	<p>You have several sections about the IP rights. Is it viable to propose a project where one aspect of the project has been published, but we do not have IP ownership of an enabling technology (businesses currently practice with this IP)? Or can we only propose technologies that we fully own or have agreements to use all the IP for?</p>		<p>Per Section 4.B.1.d. of the BAA, "IARPA requires sufficient rights to Intellectual Property (IP) developed or used in the conduct of the proposed research to ensure that IARPA can successfully (a) manage the program and evaluate the technical output and deliverables, (b) communicate program information across Government organizations, and (c) support transition to and further use and development of the program results by Intelligence community (IC) users and others at reasonable cost that is acceptable to the Government." The IP situation of each team (including licensing) is unique. Thus, IP</p>			

				rights will be negotiated with each team on a case by case basis after selection.
Question 27	Round 2	<p>Brookhaven National Labs may have facilities or services that can be procured as general technical services for providing additional highly specialized diagnostic capabilities that are not unique to any particular bidder for the RESILIENCE program, and therefore we do not believe that would be against the BAA language indicating that FFRDC's can't act as performers or subcontractors on the proposed effort. Please confirm this services procurement arrangement is acceptable.</p>		<p>Brookhaven and other similar entities (i.e., Other Government Agencies, FFRDC, UARC, GOCOs, etc.) are not eligible to submit proposals or participate as team members on this BAA however, there are instances when these type of entities provide a unique facility, specialized equipment or technical service that is not otherwise obtainable. In such cases, offerors can request use and the Government will determine if the resource can be made available to all offerors as Government Furnished Property/Equipment/Information/Service (GFP/GFE/GFI/GFS).</p> <p>Requests for such resources can be submitted during the Q&A period but it may not be</p>

				<p>possible for the Government to resolve the matter and provide a definitive answer before proposals are due. In this case, the offeror can identify resources required to perform in its proposal (Reference: Section 4.B.1.b and Section 2 E.) along with full details on the matter so that the Government can review.</p> <p>If the resource requested cannot be provided directly by the Government as GFP/GFE/GFI/GFS, the Government may consider an offeror's request for limited use as a procured service not otherwise available only after an OCI review and determination.</p> <p>It is advised that the offeror have an alternate plan in its proposal in case the Government does not accept the proposed participation of an ineligible entity in its proposal.</p>		
	Section 2 - AWARD INFORMATION				Change to BAA	Paragraph & Page #

						(Yes/ No)	
	Section 3 - ELIGIBILITY INFORMATIO N					Chan ge to BAA (Yes/ No)	Paragra ph & Page #
	Section 4 - PROPOSAL INFORMATO N					Chan ge to BAA (Yes/ No)	Paragra ph & Page #
	Section 5 - PROPOSAL REVIEW INFORMATIO N					Chan ge to BAA (Yes/ No)	Paragra ph & Page #

