

Department of the Army
DoD 22.4 Small Business Innovation Research (SBIR) Annual BAA
xTech/SBIR Clean Tech Finalists
Proposal Submission Instructions

May 4, 2022: Topic issued for pre-release

June 30, 2022: DSIP Topic Q&A closes to new questions at 12:00 p.m. ET

July 7, 2022: Army begins accepting proposals via DSIP

July 14, 2022: Deadline for receipt of proposals no later than 12:00 p.m. ET

IMPORTANT: A prize competition, xTech/SBIR Clean Tech Competition, will be used to identify small business concerns that meet the criteria for award. Winners selected from the xTech/SBIR Clean Tech prize competition will be the only firms eligible to submit a proposal under this topic. All other proposals will not be evaluated.

INTRODUCTION

The future Army must be capable of conducting Multi-Domain Operations (MDO) as part of an integrated Joint Force across an array of situations in multiple theaters by 2035. The MDO concept describes how the Army will support the Joint Force in the rapid and continuous integration of all domains of warfare – land, sea, air, and cyberspace – to deter and prevail as we compete short of conflict, and fight and win if deterrence fail. The Army must provide game-changing capabilities to our Soldiers. To capitalize on small business innovation, the Army has implemented an approach to advertise SBIR funding opportunities through the Department of Defense (DoD) Annual BAA process, outside of the three pre-determined BAA cycles. This approach also strives to create a more rapid award time from solicitation to closing.

Topics released under this BAA deviate from the traditional Army SBIR period of performance, contract award guidelines, and other proposal instructions. Please take note of the contents of the DoD Program BAA instructions, supplemented herein, when preparing proposals. Proposals will only be evaluated in response to an active corresponding Army topic.

This BAA must follow all general instructions provided in the Department of Defense (DoD) SBIR Program BAA. The Department of the Army requirements in addition to or deviating from the DoD Program BAA are provided in the instructions below.

Specific questions pertaining to the administration of the Army SBIR/xTech Program and these proposal preparation instructions should be directed to: Army Applied SBIR Team at usarmy.pentagon.hqda-asalt.mbx.army-applied-sbir-program@army.mil .

ELIGIBILITY

The eligibility requirements for the SBIR/STTR programs are unique and do not correspond to those of other small business programs. Please refer to Section 3.1, Eligible Applicants, of BAA 21.4 for full eligibility requirements.

A prize competition, xTech/SBIR Clean Tech Competition, will be used to identify small business concerns that meet the criteria for award of a Phase I or Direct to Phase II (D2PhII) SBIR contract under 10 U.S.C. §2374a. Winners selected from the xTech/SBIR Clean Tech prize competition will be the only firms eligible to submit a Phase I or D2PhII SBIR proposal under this announcement. The xTech/SBIR Clean Tech Competition announcement can be found at:

<https://www.arl.army.mil/xtechsearch/competitions/xtechsbircleantech.html>

Anticipated Structure/Award Information

For this BAA, Department of the Army will accept Phase I proposals for the cost of up to \$250,000 for up to 6-month period of performance, and D2PhII proposals for the cost of up to \$1,800,000 for up to 18-month period of performance. Companies will be invited to submit either a Phase I or a D2PhII proposal following completion of the xTech/SBIR Clean Tech prize competition, executed in accordance with 10 U.S.C. Section 2374a.

During the competition, small business concerns that demonstrate feasibility, scientific merit, technical merit, commercialization potential, and can demonstrate an ability to produce a well-defined deliverable prototype will be invited to submit a D2PhII proposal; all other winners of the prize competition will be invited to submit a Phase I proposal. A prototype is defined as a model of something to be further developed, which includes designs, protocols, questionnaires, software, and devices. The D2PhII authority allows the Department of Defense (DoD) to make an award to a small business concern under Phase II of the SBIR program without regard to whether the small business concern was provided an award under Phase I of a SBIR program. Proposals that do not comply with the requirements detailed in BAA 22.4 and the research objectives of these Component Instructions are considered non-conforming and therefore are not evaluated nor considered for award.

Phase I and D2P2 proposals in response to this BAA include the following:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume
 - Part 1: Justification Documentation (1 page maximum) that will be provided by the Army Applied SBIR Office after selection as a winner of the xTech/SBIR Clean Tech Competition
 - Part 2: Technical Objectives and Approach (15 slides maximum) that will be provided by the Army Applied SBIR Office and Army xTech Program after selection as a winner of the xTech/SBIR Clean Tech Competition
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report (REQUIRED)
- Volume 5: Supporting Documents
 - Contractor Certification Regarding Provision of Prohibited Video Surveillance and Telecommunications Services and Equipment (REQUIRED)
 - Foreign Ownership or Control Disclosure (Proposers must review Attachment 2: Foreign Ownership or Control Disclosure to determine applicability.)
 - Other supporting documentation (if applicable)
- Volume 6: Fraud, Waste and Abuse Training (REQUIRED)

PHASE I PROPOSAL GUIDELINES

The Defense SBIR/STTR Innovation Portal (DSIP) is the official portal for DoD SBIR/STTR proposal submission. Proposers are required to submit proposals via DSIP; proposals submitted by any other means will be disregarded. Detailed instructions regarding registration and proposal submission via DSIP are provided in the DoD SBIR Program BAA.

Technical Volume (Volume 2)

Unless otherwise noted in the topic solicitation, the technical volume is not to exceed 15 slides and must follow the formatting requirements provided in the DoD SBIR Program BAA Any

proposals submitted in a format other than provided by the BAA or in excess of the page limit will not be reviewed.

Content of the Technical Volume

The Technical Volume will contain three key sections – Potential for Impact/Revolutionary for the Army, Army Transition Plan, and Commercialization and Potential. The technical volume should include Part 1: Justification Documentation (1 page maximum) that will be provided by the Army Applied SBIR Office after selection as a winner of the xTechSearch 6 Competition; Part 2: Technical Objectives and approach (15 slides maximum) that will be provided by the Army Applied SBIR and xTech Program Offices after selection as a winner of the xTechSearch 6 Competition. These instructions supersede those stated in section 5.3.c of the DoD Program BAA.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Phase I Base amount must not exceed \$250,000 for a 6-month period of performance. Phase I Options are not anticipated at this time. If an option is identified in the topic posting, costs for the Base and Option must be separated and clearly identified on the Proposal Cover Sheet (Volume 1) and in Volume 3.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

Volume 5 is provided for proposers to submit additional documentation to support the Cover Sheet (Volume 1), Technical Volume (Volume 2), and the Cost Volume (Volume 3). In addition to the Volume 5 requirements outlined in the DoD Program BAA, the Department of the Army may accept the following documents in Volume 5:

- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

DISCRETIONARY TECHNICAL AND BUSINESS ASSISTANCE (TABA)

The Army, at its discretion, may provide Technical and Business Assistance (TABA). The Army will select a preferred vendor(s) for the Army SBIR TABA program through a competitive process.

Alternately, a small business concern may, by contract or otherwise, select one or more vendors to assist the firm in meeting the TABA goals. The Applicant must request the authority to select its own TABA provider in the Army SBIR proposal, demonstrating that the vendor is uniquely postured to provide the specific technical and business services required.

Participation in the Army SBIR TABA program is voluntary for each Army SBIR awardee. Services provided to Army SBIR firms under the auspices of the TABA program may include, but are not limited to:

1. Access to a network of scientists, engineers, and technologists focused on commercialization and transition considerations such as protected supply chain management, advanced manufacturing, process/product/production scaling, etc;
2. Assistance with intellectual property protections, such as legal considerations, intellectual property rights, patent filing, patent fees, licensing considerations, etc;
3. Commercialization and technology transition support such as market research, market validation, development of regulatory or manufacturing plans, brand development;
4. Regulatory support such as product domain regulatory considerations, regulatory planning, and regulatory strategy development.

The Army SBIR program sponsors participation in the TABA program. The resource limitation for each firm is:

- Phase I Firms: Up to \$6,500 per project per year (in addition to the base SBIR award amount);
- Phase II Firms: Up to \$50,000 per project;
 - Army-Preferred Vendor: In addition to the base SBIR award amount;
 - Firm-Selected Vendor: Included in the base SBIR award amount and must be included in Phase II proposal.

DIRECT TO PHASE II PROPOSAL GUIDELINES

Proposers interested in submitting a DP2 proposal in response to this particular topic must provide documentation to substantiate that the scientific and technical merit and feasibility described in the Phase

I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

The Army will not evaluate the proposer's related Phase II proposal if it determines that the proposer has failed to demonstrate that technical merit and feasibility has been established or the proposer has failed to demonstrate that work submitted in the feasibility documentation was substantially performed by the proposer and/or the PI.

Feasibility documentation cannot be based upon any prior or ongoing federally funded SBIR or STTR work and DP2 proposals MUST NOT logically extend from any prior or ongoing federally funded SBIR or STTR work.

Format of Technical Volume (Volume 2)

The Technical Volume must include two parts, the Justification Documentation and the Technical Objective and Approach.

The Technical Volume must be a single Portable Document Format (PDF) file, including graphics. Perform a virus check before uploading the Technical Volume file. If a virus is detected, it may cause rejection of the proposal. Do not lock or encrypt the uploaded file. Do not include or embed active graphics such as videos, moving pictures, or other similar media in the document.

The length of the Justification Documentation is not to exceed 1 page and the length of the Technical Proposal is not to exceed 15 slides/pages. A commercialization plan must also accompany the technical proposal and should be no more than 10 slides. Any proposals submitted in a different format, or exceed the page count limits will not be reviewed.

Number all pages of your proposal consecutively. Font size should not be smaller than 10- point on standard 8-1/2" x 11" paper with one-inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by DSIP when the Cover Sheet was created. The header may be included in the one-inch margin.

Content of the Feasibility Documentation (Volume 2a)

Proposers should substantiate that the scientific and technical merit and feasibility described in the Phase I section of the topic has been met and describes the potential commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results. Work submitted within the feasibility documentation must have been substantially performed by the proposer and/or the Principal Investigator.

Content of the Technical Proposal (Volume 2b)

The content of the Technical Volume should address three key areas: the technical approach, the team carrying out the work (and the accompanied resources), and the commercialization strategy. The commercialization plan should include:

- Company information: Focused objectives/core competencies; specialization area(s); products with significant sales; and history of previous Federal and non-Federal funding, regulatory experience, and subsequent commercialization successes.

- Customer and Competition: Clear description of key technology objectives, current competition, and advantages compared to competing products or services; description of hurdles to acceptance of the innovation.
- Market: Milestones, target dates, analyses of market size, and estimated market share after first year sales and after 5 years; explanation of plan to obtain market share.
- Intellectual Property: Patent status, technology lead, trade secrets or other demonstration of a plan to achieve sufficient protection to realize the commercialization stage and attain at least a temporal competitive advantage.
- Financing: Plans for securing necessary non-SBIR funding.
- Assistance and mentoring: Plans for securing needed technical or business assistance through mentoring, partnering, or through arrangements with government sponsored (e.g., State assistance programs, Federally-funded research laboratories, Manufacturing Extension Partnership centers), not-for-profits (e.g., SBDC), commercial accelerators, DOD Prime Contractors, or other assistance provider.

Proposers are free to structure each section as they like, so long as it provides sufficient detail for evaluators to understand the proposed work, who will carry it out, and how the business plans to commercialize results.

Cost Volume (Volume 3)

Unless otherwise noted in the topic, the Army will accept Direct to Phase II proposals for a cost up to **\$1,800,000** for an 18-month period of performance. Proposers are required to use the Cost Proposal method as provided on the DSIP submission site. The Cost Volume (and supporting documentation) DOES NOT count toward the page limit of the Technical Volume.

For pricing purposes, offerors should assume a contract or agreement start date of approximately ninety (90) days after submission of the proposal. For this BAA, adequate price competition (APC), as defined in FAR 15.403-1(c), is anticipated. In the event that adequate price competition is not realized (i.e. only one proposal is received for a given topic), the Government may choose to conduct additional proposal analysis, in accordance with the techniques identified at FAR 15.404-1. Additionally, offerors are to provide any current Forward Pricing Rate Agreements (FPRA) in effect at time of proposal submission.

Content of the Cost Volume (Volume 3)

ALL proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel costs to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screenshot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow contracting personnel to understand how the proposer plans to use the requested funds.

Some items in the cost breakdown may not apply to the proposed project. If that is the case, there is no need to provide information on each and every item.

Cost Breakdown Guidance:

- List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
- Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for

- the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the Army; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the Army.
- Cost for travel funds must be justified and related to the needs of the project.
 - Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required, nor will it be an evaluation factor in the consideration of a proposal.
 - All subcontractor costs and consultant costs must be detailed at the same level as prime contractor costs in regard to labor, travel, equipment, etc. Provide detailed substantiation of subcontractor costs in your cost proposal. Enter this information in the Explanatory Material section of the on-line cost proposal form. The Supporting Documents Volume (Volume 5) may be used if additional space is needed.

If a DCAA Audit has been conducted within the last five (5) years, include the audit compliance documentation in the cost proposal documents. The documentation should also include the offeror's DCAA Point of Contact (if applicable).

If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation.

For more information about cost proposals and accounting standards, see the DCAA publication titled "Audit Process Overview – Information for Contractors" available at: <http://www.dcaa.mil>.

Company Commercialization Report (CCR) (Volume 4)

Completion of the CCR as Volume 4 of the proposal submission in DSIP is required. Please refer to the DoD SBIR Program BAA for full details on this requirement. Information contained in the CCR will be considered by the Department of the Army during proposal evaluations.

Supporting Documents (Volume 5)

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- Additional Cost Information
- Funding Agreement Certification
- Technical Data Rights (Assertions)
- Lifecycle Certification
- Allocation of Rights
- Other (only as specified in the topic)

Please only submit documents that are identified in the topic instructions. All other submissions will be disregarded.

PHASE II PROPOSAL GUIDELINES

Phase II proposals may only be submitted by Phase I awardees. Phase II proposal submission window, notification process, expected budget/duration structure and additional instructions will be provided in the Phase I contract or by subsequent notification.

EVALUATION AND SELECTION

All proposals will be evaluated in accordance with the evaluation criteria listed in the DoD Program BAA unless otherwise specified. It is the policy of the Army to ensure equitable and comprehensive proposal evaluations based on the evaluation criteria listed above and to select the source (or sources) whose offer meets the Government's technical, policy, and programmatic goals.

All proposal evaluations will be based solely on the above evaluation criteria. The Army will conduct an evaluation of each conforming proposal. Proposals that do not comply with the requirements detailed in this BAA and the research objective(s) of the corresponding opportunity are considered non-conforming and therefore will not be evaluated nor considered for award.

Using the evaluation criteria, the Government will evaluate each proposal in its entirety, documenting the strengths and weaknesses relative to each evaluation criterion, and based on these identified strengths and weaknesses, make a determination of the proposal's overall selectability. Proposals will not be evaluated against each other during the evaluation process, but rather evaluated on their own individual merit to determine how well the proposal meets the criteria stated in this BAA and the corresponding opportunity.

Awards will be made to proposers whose proposals are determined to be the most advantageous to the Government, consistent with instructions and evaluation criteria specified in the BAA herein, subsequent opportunities issued, and availability of funding. Given the limited funding available for each opportunity, not all proposals considered selectable will be necessarily selected for funding.

For the purposes of this proposal evaluation process, a selectable proposal is defined as follows:

Selectable: A selectable proposal is a proposal that has been evaluated by the Government against the evaluation criteria listed in the DoD Program BAA, and the strengths of the overall proposal outweighs its weaknesses. Additionally, there are no accumulated weaknesses that would require extensive negotiations and/or a revised proposal.

For the purposes of this proposal evaluation process, a non-selectable proposal is defined as follows:

Non-Selectable: A proposal is considered non-selectable when the proposal has been evaluated by the Government against the evaluation criteria listed in the DoD Program BAA and the strengths of the overall proposal do not outweigh its weaknesses.

Proposing firms will be notified via email of selection or non-selection status for a Phase I or direct to Phase II award within 90 days of the closing date of the BAA. The notification will come from the Army SBIR Program Office PoC mailbox sent to the Corporate Official listed on the proposal cover sheet. The Army promotes transparency regarding the technical evaluation for all Army SBIR proposals. The Army will provide a technical evaluation narrative to the proposer in accordance with the SBA Policy Directive, Appendix I, paragraph 4. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

A Contracting Officer (KO) may contact applicants, when the Army SBIR Office has recommended a proposal for award, in order to discuss additional information required for award. This may include representations and certifications, revised budgets or budget explanations, certificate of current cost or

pricing data, subcontracting plan for small businesses, and/or other information as applicable to the proposed award. The anticipated start date will be determined at that time.

Proposers must not regard the notification email as an authorization to commit or expend funds. Until a Government KO signs the award document (i.e. contract), no obligations to provide funding are made. The award document signed by the Government KO is the official and authorizing award instrument (i.e. contract). The KO will email the signed, authorizing award instrument to the principal investigator (PI) and/or an authorized organization representative.

Refer to the DoD SBIR Program BAA for procedures to protest the Announcement.

As further prescribed in FAR 33.106(b), FAR 52.233-3, Protests after Award should be submitted to the Point of Contract identified in the topic solicitation:

Email: usarmy.pentagon.hqda-asa-alt.mbx.army-applied-sbir-program@army.mil

Mailing Address:

Army Applied SBIR Office
2800 Crystal Dr; Ste 11252
Arlington, VA 22201

AWARD AND CONTRACT INFORMATION

Only proposers who are finalists in xTech/SBIR Clean Tech Competition and follow the above criteria will be evaluated and considered for this topic. If you are NOT a finalist within xTech/SBIR Clean Tech Competition, please do not submit proposals for this topic as they will be automatically disqualified.

Army SBIR 22.4 Topic Index
Release 8

A224-016 xTech/SBIR Clean Tech Open Topic Competition

OUSD (R&E) MODERNIZATION PRIORITY: General Warfighting Requirements (GWR)

TECHNOLOGY AREA(S): Materials; Battlespace; Human Systems; Information systems; Air platform; Ground Sea

OBJECTIVE: The xTech/SBIR Clean Tech competition aims to accelerate the integration of technology solutions for crucial Army capability gaps within the clean tech focus areas. The competition is an opportunity for eligible entities to pitch their transformative technology solutions directly to the U.S. Army. In addition to cash prizes, participants will receive operationally-relevant and technical feedback from Army and Department of Defense experts on proposed ideas submitted to this competition, direct exposure to key stakeholders, and the potential for SBIR contracts.

This competition is sponsored by the Assistant Secretary of the Army (Acquisition, Logistics, and Technology). As the Army aims to reduce greenhouse gas emissions by 30%, by 2030, ASA(ALT) is committed to that mission through supporting technological innovation and utilizing the Army xTech and Army SBIR programs to help in achieving the Army's overarching goals. The ASA(ALT) recognizes that the U.S. Army must enhance engagements with small businesses by (1) understanding the spectrum of 'world-class' technologies being developed commercially within the clean tech realm, that may benefit the Army, (2) integrating the sector of commercial innovators into the Army's Science and Technology ecosystems, and (3) providing mentorship and expertise to accelerate, mature, and transition technologies of interest to the Army.

DESCRIPTION:

The xTech/SBIR Clean Tech competition is seeking novel, disruptive concepts and technology solutions that have both civilian and military applications (dual use capabilities) that can assist in tackling the Army's current needs and be applied to current Army concepts. The intent is to provide the Army with transformative technology solutions while enabling cost savings throughout the Army systems life-cycle.

Participants can submit applications on any solution related to clean tech that might apply to the Army's current needs. Below is a list of key focus areas for this competition, but eligible entities can submit on solutions outside of these areas that are related to clean tech.

- **Clean Energy Generation:** The U.S. Army is looking for reliable and affordable ways to generate energy from renewable, zero-emission, non-polluting sources. This includes solar, wind, water, nuclear, thermal, and waste-to-energy based energy solutions or a combination of these alone or with legacy DOD power generation systems.
- **Clean Energy Storage:** Clean Energy Storage focuses around energy storage systems (batteries, capacitors, hybrid devices, and DC/DC converters) and the technology solutions to optimize single cell, modules, and vehicle-packaged cost, performance, safety, life, abuse tolerance, recycling, and sustainability within production, use, and disposal processes.
- **Clean Micro Grid:** Clean micro grids focuses on devices and controlling digital information systems that optimize the efficiency, reliability, and security of grid-delivered power. This includes management, energy storage, metering & monitoring, AI grid optimization, sensors, diagnostics/prognostics, and analytics.
- **Electric Transportation:** Electric transportation focuses on software and hardware solutions for electric and hybrid-electric systems for vehicles and aviation. This includes the supporting infrastructure for operational energy availability and sustainment. Components may include

platform rechargers with or without power generation sources, range extenders, and battery technologies.

- **Clean Industry Tech.** Clean Industry Tech puts focus on overall sustainability of industrial processes and associated supply chains. This area emphasizes emissions minimization and efficiency maximization. Solutions sought includes altering manufacturing processes to decrease resource consumption, generate sustainable power and fuels, and develop alternatives for environmentally harmful or scarce materials.

PHASE I: Companies will complete a feasibility study that demonstrates the firm's competitive technical advantage relative to other commercial products (if other products exist) and develop concept plans for how the company's technology can be applied to Army modernization priority areas. Studies should clearly detail and identify a firm's technology at both the individual component and system levels, provide supporting literature for technical feasibility, highlight existing performance data, showcase the technology's application opportunities to a broad base of customers outside the defense space, a market strategy for the commercial space, how the technology directly addresses the Army's modernization area as well as include a technology development roadmap to demonstrate scientific and engineering viability.

At the end of Phase I, the company will be required to provide a concept demonstration of their technology to demonstrate a high probability that continued design and development will result in a Phase II mature product.

Proposers interested in submitting a Direct to Phase II (DP2) proposal must provide documentation to substantiate that the scientific and technical merit and feasibility described above has been met and describes the potential military and/or commercial applications. Documentation should include all relevant information including, but not limited to: technical reports, test data, prototype designs/models, and performance goals/results.

PHASE II: Produce prototype solutions that will be easy to operate by a Soldier. These products will be provided to select Army units for further evaluation by the soldiers. In addition, companies will provide a technology transition and commercialization plan for DOD and commercial markets.

PHASE III DUAL USE APPLICATIONS: Complete the maturation of the company's technology developed in Phase II to TRL 6/7 and produce prototypes to support further development and commercialization. The Army will evaluate each product in a realistic field environment and provide small solutions to stakeholders for further evaluation. Based on soldier evaluations in the field, companies will be requested to update the previously delivered prototypes to meet final design configuration.

REFERENCES: <https://www.arl.army.mil/xtechsearch/competitions/xtechsbsircleantech.html>

KEYWORDS: Clean Energy; renewable energy; energy storage; micro-grid; electric transportation; hybrid-electric; clean industry; sustainability; emissions