U.S. DEPARTMENT OF ENERGY

FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT

Small Business Innovation Research (SBIR)
Small Business Technology Transfer (STTR)

FY 2018 Phase I Release 2

Funding Opportunity Number: DE-FOA-0001771
CFDA Number: 81.049

ISSUE DATE: November 27, 2017

LETTER OF INTENT DUE DATE: Monday, January 8, 2018, 5:00 PM EASTERN TIME

PRE-APPLICATION DUE DATE: Not Required

APPLICATION DUE DATE: Monday, February 26, 2018, 11:59 PM EASTERN TIME

URGENT REMINDERS

PROPRIETARY DATA MARKING

The procedure for identifying proprietary data contained in your application has recently changed. Please follow the instructions provided in Part VIII, D. of this Funding Opportunity Announcement (FOA) regarding the marking of the data considered proprietary.

DIGITAL DATA MANAGEMENT

The Department of Energy (DOE) has applied a new digital data management policy, applicable to applications submitted under this FOA, and detailed in Part IV of this FOA.

APPLICATION PREPARATION

Applicants must download the application package, application forms and instructions, from Grants.gov at www.grants.gov/. (Additional instructions are provided in Part IV, A. of this FOA.)

Applicants are required to use the compatible version of Adobe Reader software to complete a Grants.gov Adobe application package. To ensure you have the Grants.gov compatible version of Adobe Reader, visit the download software page at http://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html

Online assistance is available for application preparation: http://www.doesbirlearning.com/.

WHERE TO SUBMIT

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. See Part IV, I. of the FOA for more information.

WHERE TO FIND THE TOPICS

To download the FY 2018 Phase I Release 2 Topics in a searchable PDF file, please visit the DOE SBIR/STTR web site by clicking on the following link: http://science.energy.gov/sbir/funding-opportunities/.

RECOMMENDATION

Please register in all systems as soon as possible, as described in Part IV of this FOA. You are also encouraged to submit letters of intent and applications well before the deadline.

DON'T FAIL THE INITIAL REVIEW

The number one reason applications are declined without merit review is applicants fail to submit required documents as specified Part IV, Section C. Examples include commercialization plans and subaward budgets and justifications.

PHASE I PRINCIPAL INVESTIGATOR MEETING

Phase I Principal Investigators are expected to attend a DOE SBIR/STTR Phase I Principal Investigator Meeting. This two day meeting will be held in the DC metro area. Applicants may include the registration cost ($250) and Principal Investigator travel in their Phase I budget.

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PART I – FUNDING OPPORTUNITY DESCRIPTION

STATUTORY AUTHORITY

Public Law 95-91, US Department of Energy Organization Act
Public Law 97-219, Small Business Innovation Development Act of 1982
Public Law 102-564, Small Business Research and Development Enhancement Act of 1992
Public Law 112-81, SBIR/STTR Reauthorization Act of 2011

APPLICABLE REGULATIONS

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, codified at 2 CFR 200, and the U.S. Department of Energy Financial Assistance Rules, codified at 2 CFR 910

GENERAL INQUIRIES ABOUT THIS FOA SHOULD BE DIRECTED TO:

Technical/Scientific Program Contact:

Please refer to the appropriate DOE program manager listed in the accompanying topics document.

Administrative Contact (questions about budgets and eligibility):

Carl Hebron, (301) 903-5707, SBIR-STTR@science.doe.gov

This Funding Opportunity Announcement (FOA) describes two distinct funding opportunities for the U.S. Department of Energy (DOE) Small Business Innovation Research (SBIR) and the Small Business Technology Transfer (STTR) programs for Fiscal Year (FY) 2018 Phase I Release 2.

A. PHASE I

Phase I grants resulting from this competition will be made during FY 2018 to small businesses with maximum award sizes of $150,000 or $225,000 depending on the topic. Please refer to the topic descriptions under this FOA found on the DOE SBIR/STTR web site at http://science.energy.gov/sbir/funding-opportunities/ to determine the maximum award size for each topic. The period of performance will depend on the scope of the effort but will not exceed 12 months. Please note that the Phase II grant application will be due approximately 9.5 months after the grant start date, with no exceptions. Grantees that select a Phase I period of performance of 9 months or less will be able to complete their Phase I project prior to submission of their Phase II grant application. Grantees that select a Phase I longer than 9 months will be able to continue R&D after their Phase II application is submitted but will not be able to utilize these results in the preparation of their Phase II application.

Phase I is to evaluate, insofar as possible, the scientific or technical merit and feasibility of ideas that appear to have commercial potential and/or substantial application in support of DOE mission research. The grant application should concentrate on research that will contribute to proving scientific or technical feasibility of the approach or concept. Success in a DOE Phase I is a prerequisite to further DOE support in Phase II.

Only awardees issued Phase I grants under this FOA are eligible to submit a Phase II application under the corresponding FY 2019 Phase II Funding Opportunity Announcement, i.e., FY 2019 Phase II Release 2.

Approximately 40% of Phase I awardees submitting a Phase II application will receive a Phase II award. Instructions and eligibility requirements for submitting Phase II grant applications will be posted at a later date on the internet at www.grants.gov.

Grant opportunities are announced pursuant to the Small Business Innovation Development Act of 1982 (Public Law 97-219), the Small Business Research and Development Enhancement Act of 1992 (Public Law 102-564), and the SBIR/STTR Reauthorization Act of 2011 (Public Law 112-81). Small businesses (see definition in Part III – Eligibility Information) with strong research capabilities in science or engineering are encouraged to apply. Some topics may seek manufacturing-related innovations in accordance with Executive Order 13329, "Encouraging Innovation in Manufacturing."

B. SBIR/STTR PROGRAM OBJECTIVES

The objectives of the SBIR/STTR programs include increasing private sector commercialization of technology developed through DOE-supported research and development (R&D), stimulating technological innovation in the private sector, encouraging participation by women-owned and minority-owned small businesses, and improving the return on investment from Federally-funded research for economic and social benefits to the nation. DOE will support high-quality research or R&D on innovative concepts concerning important mission-related scientific or engineering problems and opportunities that have high potential for commercialization. The DOE SBIR/STTR Programs do not support either basic science or demonstration projects.

Other than different eligibility requirements (see Part III – Eligibility Information), the major difference between the SBIR and STTR programs is that STTR grants must involve substantial cooperative research collaboration between the small business and a single Research Institution (see definitions in Appendices/Reference Material at the end of this FOA). However, it should be noted that the SBIR program also permits substantial collaboration between the small business and other organizations, including Research Institutions. The difference is that in SBIR, the collaboration is optional, while in STTR, the collaboration is required and must be cooperative in nature.

To increase the number of high-quality SBIR/STTR Phase I applications submitted to the DOE by women-owned or minority-owned small businesses, and small businesses from DOE's underrepresented states (see eligible state list below), the DOE provides a variety of application preparation and other related services, free of charge.

Phase 0 services are offered on a first-come, first-serve basis to eligible applicants. For more information on the DOE SBIR/STTR Phase 0 Assistance Program and to determine eligibility, please visit http://www.dawnbreaker.com/doephase0/.

The following states, district, and commonwealth are underrepresented in the DOE SBIR/STTR programs: AK, DC, GA, HI, IA, ID, IN, KS, LA, ME, MN, MS, MT, NC, ND, NE, NY, OK, PA, PR, RI, SC, SD, WA, WI.

An important goal of the SBIR/STTR programs is the commercialization of DOE-supported research or R&D. Following the start of Phase I, DOE encourages its awardees to begin thinking about and seeking commitments from private sector or Federal non-SBIR/STTR funding sources in anticipation of Phases II and III. The commitments should be obtained prior to the Phase II grant application submission. The commitment for Phase III may be made contingent on the DOE-supported research or R&D meeting some specific technical objectives in Phase II, which if met, would justify funding to pursue further development for commercial purposes in Phase III. For Phase I applicants, more details will be provided in the Phase II FOA.

Under Phase III, it is intended that non-SBIR/STTR funds be used by the small business to pursue commercial applications of the R&D. That is, the non-SBIR/STTR Federal funding pays for research or R&D meeting DOE mission-related objectives identified by the DOE Phases I and II; non-SBIR/STTR capital provides follow-on developmental funding to meet commercial objectives for Phase III. Additionally, under Phase III, Federal agencies may award non-SBIR/STTR funded follow-on grants or contracts to Phase I and Phase II awarded projects for (1) products or processes that meet the mission needs of those agencies, or (2) further research or R&D. The competition for SBIR/STTR Phase I and Phase II awards satisfies any competition requirement of the Federal Property and Administrative Services Act, and the Competition in Contracting Act. Therefore, an agency that funds an SBIR/STTR Phase III project is not required to conduct another competition in order to satisfy those statutory provisions.

The receipt of earlier Phase funding does not represent any commitment or obligation to fund a later Phase.

C. TECHNOLOGY TRANSFER OPPORTUNITY

A Technology Transfer Opportunity (TTO) is an opportunity for small businesses, in the course of an SBIR/STTR award, to leverage technology that has been developed at a participating DOE Research Institution. Please refer to the Topics document associated with this FOA. The TTO will be described in a particular subtopic and additional information may be obtained by using the link in the subtopic to the DOE Research Institution that has developed the technology. Typically, the technology was developed with DOE funding of either basic or applied research at a DOE Research Institution and is available for transfer to the private sector. The level of technology maturity will vary and applicants are encouraged to investigate what work has been done prior to submitting an application.

Those selected for award under a TTO subtopic, will be assigned rights by the Research Institution owning the technology, to perform research and development of the technology during their Phase I or Phase II grants. Please note that these are NOT commercial rights allowing you to license, manufacture, or sell, but only rights to perform research and development.

In addition, the DOE Research Institution will provide the grantee, prior to the start of its Phase I grant, with a no-cost, six month option to license the technology. It will be the responsibility of the small business to demonstrate adequate progress towards commercialization and to negotiate an extension to the option or convert the option to a license. A copy of the option agreement template will be available at the Research Institution website owning the TTO.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding grants under this FOA.

B. ESTIMATED FUNDING

Approximately $16,400,000 is expected to be available for new awards under this FOA. Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling (i.e., the maximum amount for an individual award made under this FOA): $150,000 or $225,000 for SBIR and STTR grants depending on Topic. Please refer to the specific Topic on the DOE SBIR/STTR web site at http://science.energy.gov/sbir/funding-opportunities/ for maximum funding limits.

Floor (i.e., the minimum amount for an individual award made under this FOA): N/A

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making approximately 106 awards under this FOA. SBIR and STTR awards are subject to the availability of appropriated funds and this FOA does not obligate DOE to make any awards.

E. ANTICIPATED AWARD SIZE

The anticipated average Phase I award will be approximately $150,000.

F. PERIOD OF PERFORMANCE

DOE anticipates making Phase I awards that will have a period of performance of 6 to 12 months with a start date of July 2, 2018.

G. TYPE OF APPLICATION

DOE will accept new Phase I applications under this FOA.

PART III – ELIGIBILITY INFORMATION

A. ELIGIBLE SBIR AND STTR APPLICANTS

SBIR/STTR program eligibility requirements are in place to ensure that the funds go only to small, independent United States (U.S.) businesses. The regulations, 13 CFR 121, include restrictions about (1) the type of firm, (2) its ownership structure, and (3) the firm's size in terms of the number of employees. The purpose of the requirement regarding type of firm is to target the awards to firms with an economic interest in developing the idea or research into a commercial application.

The purpose of the ownership requirement is to limit the program to independent firms controlled by U.S. citizens or permanent resident aliens as a way of maximizing the likelihood that the funding will stimulate innovative activity within the U.S. economy. The purpose of the size restriction (number of employees of the firm and its affiliates) is to limit program funding to small business concerns with a unique capacity for innovation and are more likely to be constrained by lack of access to such funding.

A majority (more than 50%) of your firms' equity (e.g., stock) must be directly owned and controlled by one of the following:

1. One or more individuals who are citizens or permanent resident aliens of the U.S. Each individual you include as part of the eligible ownership majority of your company must be either a citizen or permanent resident alien of the U.S. The term "individual" refers only to actual people—it does not refer to companies or other legal entities of any sort. "Permanent resident alien" refers to an alien admitted to the U.S. as a lawful permanent resident by the U.S. Citizenship and Immigration Services. If a size determination is conducted of your firm, you may be asked to show proof of this ownership;

2. Other for-profit small business concerns (each of which is directly owned and controlled by individuals who are citizens or permanent resident aliens of the U.S.). If you include other business concerns as part of the eligible ownership majority of your firm, you should verify that each such concern is more than 50% owned and controlled by individuals who are U.S. citizens or permanent resident aliens; or

3. A combination of (1) and (2) above.

Only U.S. small business concerns (SBCs) are eligible to submit SBIR and STTR applications. Joint ventures, as defined in "Appendices/Reference Material," may apply, provided the entity created also qualifies as a small business at the time of the award. An SBC is one that, at the time of award for both Phase I and Phase II SBIR/STTR awards, meets all of the following criteria:

- Organized for profit, with a place of business located in the U.S., which operates primarily within the U.S. or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor;

- Is in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture, there can be no more than 49% participation by foreign business entities in the joint venture;

- Is at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the U.S., or it must be a for-profit business concern that is at least 51% owned and controlled by another for-profit business concern that is at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the U.S. (except in the case of a joint venture, where each entity to the venture must be 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the U.S.); and

- Has, including its affiliates, not more than 500 employees and meets the other regulatory requirements found in 13 CFR 121. Business concerns, other than investment companies licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 U.S.C. 661, et seq., are affiliates of one another when either directly or indirectly, (a) one concern controls or has the power to control the other; or (b) a third-party/parties controls or has the power to control both. Control can be exercised through common ownership, common management, and contractual relationships. The term "affiliates" is defined in greater detail in 13 CFR 121. The term "number of employees" is defined in 13 CFR 121.

SBC's that are majority-owned by one or more venture capital operating companies, hedge funds, or private equity firms are not eligible for funding under this FOA. SBC's must meet this criterion at both time of submission and time of award.

Further information may be obtained by contacting the Small Business Administration Size District Office at www.sba.gov/.

SBC's submitting to both the SBIR and STTR programs must meet eligibility requirements of both SBIR and STTR applicants. If an application is submitted to both programs but fails to meet the eligibility requirement for one of the programs, it will only be considered for the one program for which it does meet the eligibility requirements.

To be eligible for a DOE Phase I SBIR or STTR award, the applicant must meet the Phase I to Phase II Transition Rate Benchmark as required by the SBIR/STTR Reauthorization Act of 2011. The Transition Rate requirement applies only to SBIR and STTR Phase I applicants that have received more than 20 Phase I awards over the past five fiscal years, excluding the most recently completed fiscal year. For these companies, the benchmark establishes a minimum number of Phase II awards the company must have received for a given number of Phase I awards received during the five-year time period in order to be eligible to receive a new Phase I award. This requirement does not apply to companies that have received less than 20 Phase I awards over the five-year period.

The Commercialization Rate requirement applies only to SBIR and STTR Phase I applicants that have received more than 15 Phase II awards during the past ten fiscal years, excluding the two most recently completed fiscal years. For these companies, this benchmark establishes the minimum levels of commercialization activity a company must have achieved to-date that result from its Phase II awards from this ten-year period of time. On June 1 of each year, SBIR/STTR awardees registered on SBIR.gov are assessed to determine if they meet these benchmark requirements. Companies that fail to meet the transition rate or the commercialization rate benchmarks are not eligible for a Phase I award for a period of one year from the date of the assessment.

The Transition Rate is calculated as the total number of SBIR and STTR Phase II awards a company received during the past five fiscal years divided by the total number of SBIR and STTR Phase I awards it received during the past five fiscal years, excluding the most recently completed year. The benchmark minimum Transition Rate is currently 0.25. The Commercialization Rate is calculated as the total revenues and additional investment to-

date that have resulted from Phase II awards received during the past ten fiscal years, excluding the two most recently completed fiscal years, divided by the total number of such Phase II awards OR the total number of patents resulting from these Phase II awards divided by the total number of Phase II awards. The Commercialization Rate minimums are currently set at $100,000 for total revenue/investment and 0.15 for number of patents per Phase II awards

SBA calculates the individual company Transition and Commercialization Rates using SBIR and STTR award information across all Federal agencies reported on www.sbir.gov. Companies that fail to meet these benchmarks are notified directly by the SBA. More information on the Transition Rate and Commercialization Rate requirements is available at www.sbir.gov.

In accordance with 2 CFR 910.126, Competition, eligibility for award is restricted to SBC's as described above.

B. PARTICIPATION BY FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTERS

Federally Funded Research and Development Centers (FFRDC) are not eligible for an award under this FOA, but they may be proposed as a team member subject to the following guidelines:

AUTHORIZATION FOR NON-DOE/NNSA FFRDCS

The Federal agency sponsoring the FFRDC must authorize in writing the use of the FFRDC on the proposed project and this authorization must be submitted with the application. The use of an FFRDC must be consistent with its award and must not place the FFRDC in direct competition with the private sector.

AUTHORIZATION FOR DOE/NNSA FFRDCS

The cognizant DOE contracting officer must authorize in writing the use of a DOE/NNSA FFRDC on the proposed project and this authorization should be submitted with the application, if available. The following wording is acceptable for this authorization.

"Authorization is granted for the Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory, and will not place the laboratory in direct competition with the domestic private sector."

Failure to obtain such approval in a timely manner may delay the project if a grant is awarded, as work may not be performed by the FFRDC until DOE Contracting Officer approval is provided.

RESPONSIBILITY

A successful applicant will be the responsible authority regarding the settlement and satisfaction of all contractual and administrative issues, including but not limited to, disputes and claims arising out of any agreement between the applicant and the FFRDC.

CONFLICTS OF INTEREST

Applicants must be aware of potential conflicts of interest in the event their SBIR or STTR application includes a subcontract to a research institution (e.g. National Laboratory, University, etc.) and the applicant's employee(s)/ownership is (are) also an employee(s) of the research institution. A potential conflict of interest can also arise when an applicant obtains a license or option license for a TTO from a National Laboratory and the

applicant subcontracts to the same Laboratory for work to be performed in commercializing the TTO. (The subcontracted work might either be a Work for Others or a CRADA.)

Any conflict of interest related to a subcontracted effort shall be addressed prior to award by providing (to DOE) a statement from the DOE Contracting Officer at the Laboratory Site Office, that he/she confirmed that the Laboratory is aware of the ownership (or dual employment) and that the Laboratory has conducted a conflict review in accordance with its approved conflict procedures. A similar statement should be obtained from the Sponsored Program Office or similar business office in the event the subcontract is with a University or other research institution.

In addition, the recipient shall provide to DOE prior to award, a document detailing how it will exercise both financial and managerial control over the project and how the recipient will isolate the Research Institution employee(s) from influencing control of the project.

C. COST SHARING

Cost sharing under this FOA is not required. However, any commercial contribution will be considered as part of the evaluation.

D. OTHER ELIGIBILITY REQUIREMENTS

All funded research or R&D must be performed in the U.S. for both Phases I and II, except under exceptional circumstances, for which an explanation must be submitted to DOE and an approval, if made, has been conveyed in writing by DOE. "U.S." means the 50 states, the territories, and possessions of the U.S., the Commonwealth of Puerto Rico, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Palau, and the District of Columbia. Non-U.S. citizens are eligible to perform work on SBIR/STTR projects provided they are legally empowered to work in the U.S. at the time that an award is made and throughout the duration of the project. That is, a foreign national working on an SBIR/STTR project must NOT be an illegal alien and must be an immigrant alien or a foreign national visiting the U.S. on an approved visa.

In exceptional circumstances, where expertise or facilities do not exist in the U.S. to perform the R&D, applicants may propose to perform R&D outside the U.S. in their application. In these situations, the applicant must clearly justify the need for foreign R&D including details of domestic experts and facilities that were contacted to make this determination. No pre-approval of foreign R&D will be granted in advance of the application. DOE will make a determination on whether performance of R&D outside the U.S. is justified as part of the application review process. Insufficient justification may result in declination of the application.

None of the employees or owners of the applicant small business may be paid as consultants. None of the employees or owners of the applicant small business may be employees of a subcontractor, except when the subcontractor is a research institution. Consultants must not be employees of any proposed subcontractor. Please note, a person listed on the budget form (Section A - Key/Senior Person or Section B - Other Personnel) as an employee of the SBC is required to be either (a) an owner of the business, (b) paid using a W-2 form, or (c) possess an Internal Revenue Service Form SS-8 determination that the person is an employee. Persons receiving a 1099 (and not possessing an employee determination using Form SS-8) are to be treated as independent contractors and should be listed on the budget form in Section F - Other Direct Costs.

An applicant may be required to submit proof that its personnel may legally perform work on this project before a new, continuation, or transition award is made.

Applicants must include all mandatory documents described in Part IV.C. Failure to include mandatory documents will result in the declination of the application during initial review.

E. SUBMITTING LETTERS OF INTENT

A single Letter of Intent (LOI) is required for each application and must be received by the deadline listed in Part IV, E. Only those applicants for which an LOI has been received by the due date are eligible to submit an application under this FOA. DOE uses LOIs to identify reviewers. Therefore applicants are requested to submit an LOI only when there is serious intent for submission of an application.

Applicants are limited to submitting a total of ten different LOI under this FOA and each LOI must be uniquely responsive to the topic and subtopic to which it is submitted. Duplicate LOI's (those containing essentially similar abstracts) will not be accepted to this FOA, only the last submission will be accepted. If more than ten LOI's are received under this FOA, only the last ten LOI's received will be accepted. Please refer to Part IV, B. for LOI content guidance.

F. RESTRICTIONS ON SUBMITTING APPLICATIONS

CHOICE OF TOPIC AND SUBTOPIC

Each application must be submitted to only one topic, including a Technology Transfer Opportunity topic, if applicable, and, within the topic, to only one subtopic. DOE will not assign a topic and/or subtopic to applications; this must be done by the applicant. When an application has relevance to more than one subtopic within a topic, the applicant must decide which subtopic is the most relevant and submit the application under that subtopic only. Each grant application must fall within the description of the subtopic, and also satisfy any conditions contained in the introductory section of that topic. Applications that do not directly address the subtopic statement will not be peer reviewed. The language in both the topic introductions and the subtopics should be taken literally.

RESPONSIVENESS

Applications will be evaluated for responsiveness by DOE technical program experts to ensure that they (1) meet stated FOA requirements described in Part III - Eligibility Information, and Part IV, C. and D, (2) identify a topic and subtopic, (3) contain sufficient information for a meaningful technical review, (4) are for research or for research and development, (5) do not duplicate other previous or current DOE-funded work, and (6) are consistent with program area mission, policies, and other strategic and budget priorities. Applications failing to pass this initial review will be declined without further review.

SUBMITTING TO BOTH SBIR AND STTR PROGRAMS

Applications that include at least 30%, but not more than 33%, of cooperative research collaboration with a single research institution may be considered for funding in both SBIR and STTR programs. Applicants may indicate their interest in being considered for both SBIR and STTR programs by selecting the appropriate box under "Program Type" on the "SBIR/STTR Information" form.

DUPLICATE APPLICATIONS

Duplicate or substantially similar applications, even if submitted to different topics and/or subtopics, will be rejected without review. That is, the application with the latest Grants.gov submission date and time will be the only version considered for evaluation.

MULTIPLE APPLICATIONS

Applicants are limited to submitting a total of ten different applications under this FOA and each application must be uniquely responsive to the topic and subtopic to which it is submitted. If more than ten applications are received under this FOA, only the last ten applications received will be considered for evaluation.

CLASSIFIED APPLICATIONS

Classified applications are not accepted under the DOE SBIR/STTR Programs and will be appropriately destroyed. Applications that have a probability of resulting in classified work will be administratively declined. Applicants are expected to comply with the following clause, which will be included in any grant awarded:

a. This award is intended for unclassified, publicly releasable research. You will not be granted access to classified information. DOE/NNSA does not expect that the results of the research project will involve classified information. Under certain circumstances, however, a classification review of information originated under the award may be required. The Department may review research work generated under this award at any time to determine if it requires classification.

b. Executive Order 12958 (60 Fed. Reg. 19,825 (1995)) states that basic scientific research information not clearly related to the national security shall not be classified. Nevertheless, some information concerning (among other things) scientific, technological, or economic matters relating to national security or cryptology may require classification. If you originate information during the course of this award that you believe requires classification, you must promptly:
    1. Notify the DOE Project Manager and the DOE Award Administrator;
    2. Submit the information by registered mail directly to the Director, Office of Classification and Information Control, SO-10.2; U.S. Department of Energy; P.O. Box A; Germantown, MD 20875-0963, for classification review.
    3. Restrict access to the information to the maximum extent possible until you are informed that the information is not classified, but no longer than 30 days after receipt by the Director, Office of Classification and Information Control.

c. If you originate information concerning the production or utilization of special nuclear material (i.e., plutonium, uranium enriched in the isotope 233 or 235, and any other material so determined under section 51 of the Atomic Energy Act) or nuclear energy, you must:
    1. Notify the DOE Project Manager and the DOE Award Administrator;
    2. Submit the information by registered mail directly to the Director, Office of Classification and Information Control, SO-10.2; U.S. Department of Energy; P. O. Box A; Germantown, MD 20875-0963 for classification review within 180 days of the date the recipient first discovers or first has reason to believe that the information is useful in such production or utilization; and
    3. Restrict access to the information to the maximum extent possible until you are informed that the information is not classified, but no longer than 90 days after receipt by the Director, Office of Classification and Information Control.

d. If DOE determines any of the information requires classification, you agree that the Government may terminate the award with consent of the recipient in accordance with 2 CFR part 200.339(a)(3). All material deemed to be classified must be forwarded to the DOE, in a manner specified by DOE.

e. If DOE does not respond within the specified time periods, you are under no further obligation to restrict access to the information.

G. RESTRICTIONS ON THE LEVEL OF SMALL BUSINESS PARTICIPATION – PHASE I

For both SBIR and STTR Programs, there are requirements on the amount of the research or analytical effort that must be performed by the small business in order to be selected for and to receive a grant. The research or analytical effort is defined as the total requested funding minus the cost of any purchased or leased equipment, materials, and supplies (whether purchased by the applicant, a Research Institution, or by any other subcontractor). Please refer to the Level of Effort Worksheet on the DOE SBIR/STTR Programs home page, under Application Resources to assist you in assuring the application is in compliance. Work performed by a consultant, a DOE national laboratory, or any other subcontractor, will be considered as external to the applicant organization when complying with these requirements.

SBIR RESTRICTIONS ON LEVEL OF SMALL BUSINESS PARTICIPATION

To be awarded an SBIR Phase I grant, a minimum of two-thirds or 67% of the research or analytical effort must be carried out by the applicant during Phase I; correspondingly, a maximum of one-third or 33% of the effort may be performed by an outside party such as consultants or subcontractors.

STTR RESTRICTIONS ON LEVEL OF SMALL BUSINESS PARTICIPATION

To be awarded an STTR Phase I grant, at least 40% of the research or analytical effort must be performed by the applicant, and at least 30% of the effort must be performed by a single research institution.

H. GENERAL REQUIREMENTS AND RESTRICTIONS ON THE PRINCIPAL INVESTIGATOR

The Principal Investigator (PI) is the key individual designated by the applicant to direct the project. Only one PI is acceptable per project. **Co-PIs are not allowed and should not be proposed.** The PI must be knowledgeable in all technical aspects of the application and be capable of leading the research effort. DOE's evaluation of the application is critically dependent on the qualifications of the PI. Any changes in the PI that are made after award selection are strongly discouraged and must be pre-approved by DOE. Requests for PI changes will be closely scrutinized and may cause delays in grant execution.

A Phase I PI is required to devote to the project a considerable part of his or her time. "Considerable" means a minimum average of three hours per week for the duration of the project for both SBIR and STTR Phase I projects. The number of PI hours must be reported in the budget justification. The SF 424 (R&R) Project Narrative must state the duration of the project in weeks. In order to ensure appropriate technical guidance for the project, only one PI will be accepted per project. Before a grant is awarded, the applicant will be required to sign a statement certifying adherence to these requirements.

ADDITIONAL PI RESTRICTIONS WHEN SUBMITTING TO SBIR PROGRAM ONLY

To be awarded a Phase I SBIR grant, the applicant must meet the general requirements and the PI's primary employment must be with the applicant at the time of award and during the conduct of the proposed research. Primary employment means that no less than 20 hours per week is spent in the employment of the applicant during the conduct of the project and no more than 19 hours per week spent in the employment of another organization.

ADDITIONAL PI RESTRICTIONS WHEN SUBMITTING TO STTR PROGRAM ONLY

To be awarded a Phase I STTR grant, the applicant must meet the general requirements and the PI's primary employment may be with the applicant or the research institution. However, the applicant must still provide technical control and oversight of the project. **If the PI is employed by the research institution, his or her**

primary employment (at least 20 hours per week) must be with the research institution in order to qualify under STTR and the research institution must provide at least 30% of the research effort. The PI's hours must be budgeted under the organization of his or her primary employment.

PI RESTRICTIONS WHEN SUBMITTING TO BOTH SBIR AND STTR PROGRAMS

Applicants submitting to both programs must adhere to the PI restrictions set forth. Therefore, if the PI is employed by the applicant, the applicant is eligible to submit to both programs. However, in cases where the PI is employed by the research institution, the application will only be considered under the STTR Program.

I. RESTRICTIONS ON THE MANAGEMENT OF SBIR/STTR PROJECTS

All SBIR and STTR funding agreements are made with the applicant regardless of the proportion of the work or funding of each of the performers (small business, research institution, subcontractor, etc.) under the grant. As the grantee, the applicant has the overall responsibility of the project, including financial management and the direction and control of the performance. For STTR projects, where the PI is employed by the research institution, the applicant will maintain the overall supervision of the project, while the PI will manage the research portion of the project.

It is recommended that all agreements between the applicant and any subcontractor (including the research institution collaborating in an STTR project) reflect the controlling management position of the applicant during the performance of the Phase I and/or Phase II project. This includes, but is not limited to, any business plan concerning agreements and responsibilities between the parties or for the commercialization of the resulting technology or regarding assignments from a DOE National Laboratory for a Technology Transfer Opportunity.

PART IV – APPLICATION AND SUBMISSION INFORMATION

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to www.grants.gov, select "Apply for Grants", and then select "Download a Grant Application Package." Enter the CFDA and/or the funding opportunity number located on the cover of this FOA and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

LETTER OF INTENT (LOI)

To submit an LOI:

The LOI must be submitted electronically through the DOE-SC Portfolio Analysis and Management System (PAMS) website https://pamspublic.science.energy.gov/. It is important that the LOI be a single file with extension .pdf, .docx, or .doc. The filename should not exceed 30 characters. The PI and anyone submitting on behalf of the PI must register for an account in PAMS before it will be possible to submit an LOI. All PIs and those submitting LOIs on behalf of PIs are encouraged to establish PAMS accounts as soon as possible to avoid submission delays.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with ("register to") your institution. Detailed steps are listed below.

Create PAMS Account:

To register, click the "Create New PAMS Account" link on the website https://pamspublic.science.energy.gov/.

- Click the "No, I have never had an account" link and then the "Create Account" button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the "Save and Continue" button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the "Create Account" button.
- Read the user agreement and click the "Accept" button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.

PAMS will take you to the "Having Trouble Logging In?" page. (If you have been an Office of Science merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

Register to Your Institution:

- To submit to the SBIR/STTR programs, your institution must be a small business or individual.
- Click the link labeled "Option 2: I know my institution and I am here to register to the institution." (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the "Register to Institution" link.)

- PAMS will take you to the “Register to Institution” page.
- Type a word or phrase from your institution name in the field labeled, “Institution Name like,” choose the radio button next to the item that best describes your role in the system, and click the “Search” button. A “like” search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under “Institution Name like.” Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the “Actions” link in the Options column next to the institution name to obtain a dropdown list. Select “Add me to this institution” from the dropdown. PAMS will take you to the “Institutions – List” page.
- If you do not see your institution in the initial search results, you can search again by clicking the “Cancel” button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the “Cannot Find My Institution” button and enter the requested institution information into PAMS. Click the “Create Institution” button. PAMS will add the institution to the system, associate your profile with the new institution, and return you to the “Institutions – List” page when you are finished.

Submit Your LOI:

- Create your LOI outside the system and save it as a file with extension .docx, .doc, or .pdf. Make a note of the location of the file on your computer so you can browse for it later from within PAMS.

  Your LOI must contain the following information:
  - Business Official name and contact information (telephone number and email address)
  - Name(s) of any proposed subcontractor(s) or consultant(s), if any
  - Designate that you are submitting a Phase I application.
  - Technical abstract that sufficiently describes your technology and application. The abstract should not exceed 500 words and two pages and it must provide sufficient technical depth to allow DOE to assign technical reviewers for your application. Please note that your abstract should not contain any proprietary information.

- Log into PAMS and click the Proposals tab. Click the “View / Respond to Funding Opportunity Announcements” link and find the current announcement in the list. Click the “Actions/Views” link in the Options column next to this announcement to obtain a dropdown menu. Select “Submit Letter of Intent” from the dropdown.
- On the Submit Letter of Intent page, select the institution from which you are submitting this LOI from the Institution dropdown. If you are associated with only one institution in the system, there will only be one institution in the dropdown.
- Note that you must select only one PI per LOI; to do so, click the “Select PI” button on the far right side of the screen. Find the appropriate PI from the list of all registered users from your institution returned by PAMS. (Hint: You may have to sort, filter, or search through the list if it has multiple pages.) Click the “Actions” link in the Options column next to the appropriate PI to obtain a dropdown menu. From the dropdown, choose “Select PI.”
- If the PI for whom you are submitting does not appear on the list, it means he or she has not yet registered in PAMS. For your convenience, you may have PAMS send an email invitation to the PI to register in PAMS. To do so, click the “Invite PI” link at the top left of the “Select PI” screen. You can enter

an optional personal message to the PI in the "Comments" box, and it will be included in the email sent by PAMS to the PI. You must wait until the PI registers before you can submit the LOI. Save the LOI for later work by clicking the "Save" button at the bottom of the screen. It will be stored in "My Letters of Intent" for later editing.

- Enter a title for your LOI.
- Select the appropriate Technical Topic Number from the dropdown. Click "Populate Subtopic".
- Select the appropriate Technical Subtopic Letter from the dropdown.
- To upload the LOI file into PAMS, click the "Attach File" button at the far right side of the screen. Click the "Browse" (or "Choose File" depending on your browser) button to search for your file. You may enter an optional description of the file you are attaching. Click the "Upload" button to upload the file.
- At the bottom of the screen, click the "Submit to DOE" button to save and submit the LOI to DOE.
- Upon submission, the PI will receive an email from the PAMS system <PAMS.Autoreply@science.doe.gov> acknowledging receipt of the LOI.

You are encouraged to register for an account in PAMS at least a week in advance of the LOI submission deadline so that there will be no delays with your submission.

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this FOA should reference DE-FOA-0001771.

LOIs will be used by DOE Program Managers to determine the number of independent scientific and engineering experts that may be required to conduct the application review process identified in Part V – Application Review Information. The DOE will not provide a letter of encouragement in response to your LOI. Feedback will only be provided to those applicants where the proposed R&D described in the LOI appears to be nonresponsive to the selected topic and subtopic. DOE anticipates providing this feedback within 3 weeks of the LOI deadline.

LOIs must be submitted by eligible small business applicants only. LOIs will not be accepted from research institutions or other partners.

Please visit the DOE SBIR/STTR Programs web site under "Applicant and Awardee Resources" for a LOI template.

PRE-APPLICATION

Pre-Applications are not sought under this FOA.

C. GRANTS.GOV APPLICATION SUBMISSION AND RECEIPT PROCEDURES

This section provides the application submission and receipt instructions for applications to the Office of Science. Please read the following instructions carefully and completely.

1. Electronic Delivery

The DOE is participating in the Grants.gov initiative to provide the grant community with a single site to find and apply for grant funding opportunities. The DOE requires applicants to submit their applications online through Grants.gov.

2. How to Register to Apply through Grants.gov

Instructions: Read the instructions below about registering to apply for funds. Applicants should read the registration instructions carefully and prepare the information requested before beginning the registration process. Reviewing and assembling the required information before beginning the registration process will alleviate last-minute searches for required information.

The registration process can take up to four weeks to complete. Therefore, registration should be done in sufficient time to ensure it does not impact your ability to meet required application submission deadlines.

If individual applicants are eligible to apply for this grant funding opportunity, refer to:
https://www.grants.gov/web/grants/applicants/individual-registration.html

Organization applicants can find complete instructions here:
https://www.grants.gov/web/grants/applicants/organization-registration.html

1) Obtain a DUNS Number: All entities applying for funding, including renewal funding, must have a Data Universal Numbering System (DUNS) number from Dun & Bradstreet (D&B). Applicants must enter the DUNS number in the data entry field labeled "Organizational DUNS" on the SF-424 form.

For more detailed instructions for obtaining a DUNS number, refer to:
https://www.grants.gov/web/grants/applicants/organization-registration/step-1-obtain-duns-number.html

2) Register with SAM: In addition to having a DUNS number, organizations applying online through Grants.gov must register with the System for Award Management (SAM). All organizations must register with SAM in order to apply online. Failure to register with SAM will prevent your organization from applying through Grants.gov.

For more detailed instructions for registering with SAM, refer to:
https://www.grants.gov/web/grants/applicants/organization-registration/step-2-register-with-sam.html

3) Create a Grants.gov Account: The next step in the registration process is to create an account with Grants.gov. Applicants must know their organization's DUNS number to complete this process. Completing this process automatically triggers an email request for applicant roles to the organization's E-Business Point of Contact (EBiz POC) for review. The EBiz POC is a representative from your organization who is the contact listed for SAM. To apply for grants on behalf of your organization, you will need the Authorized Organizational Representative (AOR) role.

For more detailed instructions about creating a profile on Grants.gov, refer to:
https://www.grants.gov/web/grants/applicants/organization-registration/step-3-username-password.html

4) Authorize Grants.gov Roles: After creating an account on Grants.gov, the EBiz POC receives an email notifying them of your registration and request for roles. The EBiz POC will then log in to Grants.gov and authorize the appropriate roles, which may include the AOR role, thereby giving you permission to complete and submit applications on behalf of the organization. You will be able to submit your application online anytime after you have been approved as an AOR.

For more detailed instructions about creating a profile on Grants.gov, refer to:
https://www.grants.gov/web/grants/applicants/organization-registration/step-4-aor-authorization.html

5) Track Role Status: To track your role request, refer to:
https://www.grants.gov/web/grants/applicants/organization-registration/step-5-track-aor-status.html

b. Electronic Signature: When applications are submitted through Grants.gov, the name of the organization's AOR that submitted the application is inserted into the signature line of the application, serving as the electronic signature. The EBiz POC must authorize individuals who are able to make legally binding commitments on behalf of the organization as an AOR; this step is often missed and it is crucial for valid and timely submissions.

3. How to Submit an Application via Grants.gov

Grants.gov applicants can apply online using Workspace. Workspace is a shared, online environment where members of a grant team may simultaneously access and edit different webforms within an application. For each funding opportunity announcement (FOA), you can create individual instances of a workspace.

Below is an overview of applying on Grants.gov. For access to complete instructions on how to apply for opportunities, refer to:
https://www.grants.gov/web/grants/applicants/apply-for-grants.html

1) Create a Workspace: Creating a workspace allows you to complete it online and route it through your organization for review before submitting.

2) Complete a Workspace: Add participants to the workspace, complete all the required forms, and check for errors before submission.

a. Adobe Reader: If you decide not to apply by filling out webforms you can download individual PDF forms in Workspace so that they will appear similar to other Standard forms. The individual PDF forms can be downloaded and saved to your local device storage, network drive(s), or external drives, then accessed through Adobe Reader.

NOTE: Visit the Adobe Software Compatibility page on Grants.gov to download the appropriate version of the software at: https://www.grants.gov/web/grants/applicants/adobe-software-compatibility.html

b. Mandatory Fields in Forms: In the forms, you will note fields marked with an asterisk and a different background color. These fields are mandatory fields that must be completed to successfully submit your application.

c. Complete SF-424 Fields First: The forms are designed to fill in common required fields across other forms, such as the applicant name, address, and DUNS number. To trigger this feature, an applicant must complete the SF-424 information first. Once it is completed, the information will transfer to the other forms.

3) Submit a Workspace: An application may be submitted through workspace by clicking the Sign and Submit button on the Manage Workspace page, under the Forms tab. Grants.gov recommends submitting your application package at least 24-48 hours prior to the close date to provide you with time to correct any potential technical issues that may disrupt the application submission.

4) Track a Workspace: After successfully submitting a workspace package, a Grants.gov Tracking Number (GRANTXXXXXXXX) is automatically assigned to the package. The number will be listed on the Confirmation page that is generated after submission.

For additional training resources, including video tutorials, refer to:
https://www.grants.gov/web/grants/applicants/applicant-training.html

Applicant Support: Grants.gov provides applicants 24/7 support via the toll-free number 1-800-518-4726 and email at support@grants.gov. For questions related to the specific grant opportunity, contact the number listed in the application package of the grant you are applying for.

If you are experiencing difficulties with your submission, it is best to call the Grants.gov Support Center and get a ticket number. The Support Center ticket number will assist the Office of Science with tracking your issue and understanding background information on the issue.

4. Timely Receipt Requirements and Proof of Timely Submission

Proof of timely submission is automatically recorded by Grants.gov. An electronic date/time stamp is generated within the system when the application is successfully received by Grants.gov. The applicant AOR will receive an acknowledgement of receipt and a tracking number (GRANTXXXXXXXX) from Grants.gov with the successful transmission of their application. Applicant AORs will also receive the official date/time stamp and Grants.gov Tracking number in an email serving as proof of their timely submission.

When the Office of Science successfully retrieves the application from Grants.gov, and acknowledges the download of submissions, Grants.gov will provide an electronic acknowledgment of receipt of the application to the email address of the applicant with the AOR role. Again, proof of timely submission shall be the official date and time that Grants.gov receives your application. Applications received by Grants.gov after the established due date for the program will be considered late and will not be considered for funding by the Office of Science.

Applicants using slow internet, such as dial-up connections, should be aware that transmission can take some time before Grants.gov receives your application. Again, Grants.gov will provide either an error or a successfully received transmission in the form of an email sent to the applicant with the AOR role. The Grants.gov Support Center reports that some applicants end the transmission because they think that nothing is occurring during the transmission process. Please be patient and give the system time to process the application.

D. CONTENT AND APPLICATION FORMS

Applications must be submitted using the forms provided by Grants.gov by the deadline listed in Part IV, E. For detailed application, forms, and other applicant information, please see the "Instructions for Completing a DOE SBIR/STTR Phase I Grant Application" located on the DOE SBIR/STTR Programs Office web site under "Preparing a DOE SBIR/STTR Phase I Grant Application" at https://science.energy.gov/sbir/applicant-resources/grant-application/. If there are any inconsistencies between the information provided in the FOA and the "Instructions for Completing a DOE SBIR/STTR Phase I Grant Application", the information contained in the FOA prevails. For questions regarding the preparation of an application, you may call the DOE SBIR/STTR Operations Support Staff at (301) 903-5707 or via email at sbir-sttr@science.doe.gov.

The table below lists the required forms and the attachments associated with each form. Some of the information must be directly entered onto the forms and other information must be attached to the forms as directed. Please read carefully.

Please note: Applications lacking the following required documentation will be administratively declined without technical review. To assist you in submitting the necessary forms with your application, please refer to the DOE SBIR/STTR Phase I Application Checklist, located on the DOE SBIR/STTR Programs Office web site under "Applicant and Awardee Resources" at https://science.energy.gov/sbir/applicant-resources/grant-application/.

You must complete the mandatory forms and any applicable optional forms (e.g., Disclosure of Lobbying Activities (SF-LLL)) in accordance with the instructions on the forms and the additional instructions below.

Files that are attached to the forms must be in Adobe Portable Document Format (PDF) unless otherwise specified in this announcement. Attached PDF files must be plain files consisting of text, numbers, and images without editable fields, signatures, passwords, redactions, or other advanced features available in some PDF-compatible software. Do not attach PDF portfolios.

Summary of Required Forms and Files

Your Application must include the following documents:

Name of Document	Format	Attach to
Application for Federal Assistance, SF 424 Form	PDF	
SF-LLL, Disclosure of Lobbying Activities, if applicable	PDF	Field 18
Research and Related: Budget Form	PDF	
Additional Senior Key Persons, if applicable	PDF	Field A. 9
Additional Equipment, if applicable	PDF	Field C. 11
Budget Justification	PDF	Field K
Research and Related: Senior/Key Person Profile Form	PDF	
Biographical Sketch for each person	PDF	Appropriate Block
Current & Pending Support for each person, if applicable	PDF	Appropriate Block
Research and Related: Other Project Information Form	PDF	
Project Summary/Abstract	PDF	Field 7
Project Narrative	PDF	Field 8
Bibliography and References Cited, if applicable	PDF	Include in Project Narrative
Facilities and Other Resources, if applicable	PDF	Include in Project Narrative
Equipment, if applicable	PDF	Include in Project Narrative
Other—Phase I Commercialization Plan	PDF	Field 12
Other— Data Management Plan	PDF	Field 12
Other—Level of Effort Worksheet	PDF	Field 12

Other—Letter of Commitment for consultant, sub-award, or research institution, if applicable	PDF	Field 12
Other—SBA Company Registration	PDF	Field 12
Research and Related: Sub-award Budget Form, if applicable	PDF	
Budget Justification for each Sub-award	PDF	Appropriate Block
Project/Performance Site Location(s)	PDF	
SBIR/STTR Information Form	PDF	
Commercialization History, if applicable,	PDF	Field 8

Please note, you may only use the following UTF-8 characters when naming your application attachments: A-Z, a-z, 0-9, underscore (_), hyphen (-), space ( ), and period (.). You must limit the file name to 30 or fewer characters. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing. Each attached file must have a unique filename (for example, don't use "budget justification" for both the total budget justification and a subaward budget justification).

SF 424 (R&R), APPLICATION FOR FEDERAL ASSISTANCE [MANDATORY]:

Complete this form first to populate data in other forms. Include the Topic and Subtopic with the project title in field 11. The Topic and Subtopic and the project title must be the same as submitted in your LOI; applications not meeting this requirement may be administratively declined. Each application must be submitted to a DOE SBIR/STTR Topic and, within the Topic, to only one Subtopic. DOE will not assign a Topic and/or Subtopic to grant applications; this must be done by the applicant. The Topic and Subtopic are also required on page 1 of the Project Narrative.

Complete all the required fields in accordance with the pop-up instructions on the form. Please ensure that the Project Title in field 11 of the SF 424 is identical to the title listed on your Project Narrative cover page and the title listed in your LOI.

Use 07/02/2018 as the proposed project start date.

RESEARCH AND RELATED OTHER PROJECT INFORMATION: [MANDATORY]

Complete questions 1 through 6 and attach files. If the answer to question 3 is "Yes", you must identify proprietary information with a legend on the first page of your attached Project Narrative document and on each page that contains proprietary information in accordance with instructions provided in Part VIII, Sections D. and F. Failure to comply may result in DOE's inability to treat such information as proprietary and may delay the grant process.

Note concerning question 4.a.

DOE understands the phrase in field 4.a., "potential impact – positive or negative - on the environment", to apply if the work described in the application *could* potentially have any of the impacts listed in (1) through (5) of 10 CFR Part 1021, Appendix B, Conditions that are Integral Elements of the Classes of Action. See Subpart D – Typical Classes of Actions, Appendix B to Subpart D of Part 1021 – Categorical Exclusions Applicable to Specific Agency Actions; B. Conditions that are Integral Elements of the Classes of Actions in Appendix B. (See www.ecfr.gov.)

Additionally, for actions that could have any other negative high consequence impacts to the environment or have any possibility for negative high consequence impacts to human health (e.g., use of human subjects, biosafety level 3-4 laboratory construction/operation, manufacture or use of certain nanoscale materials known to impact human health, or any activities involving transuranic or high level radioactive waste or materials or exposure to any radioactive materials beyond de minimis levels), applicants should indicate "Yes" under 4.a. and then start their explanation under 4.b. with "Negative potential impact;" followed by their explanation.

Moreover, applicants should indicate potential negative impact on the environment if: 1) there would be extraordinary circumstances (i.e., scientific or public controversy) related to the significance of environmental effects [10 CFR 1021.410(b)(2)], 2) the work is connected to other actions with potentially significant impacts [10 CFR 1021.410(b)(3)], or 3) the work is related to other nearby actions with the potential for cumulatively significant impacts [10 CFR 1021.410 (b)(3)].

If question 4.a. is answered "Yes", due to actual or potential negative impact(s) on the environment, the applicant will be required to complete the form entitled "National Environmental Policy Act (NEPA) Environmental Evaluation Notification Form" (SC-CH Form 560) upon request by the DOE contracting officer.

Lastly, if question 4.a. is answered yes due to an actual or potential positive impact on the environment, applicants should indicate "Yes" under 4.a. and then start their explanation under 4.b. with "Positive potential impact;" followed by their explanation.

For fields 7 through 12, the files that are attached must comply with the following instructions:

Project Summary/Abstract (Field 7 on the Form) [MANDATORY]

The Project Summary/Abstract must contain a summary of the proposed activity suitable for dissemination to the public. This document must not include any proprietary or sensitive business information as DOE may make it available to the public. The Project Summary/Abstract must not exceed 1 page. Save this information in a file named "Summary.pdf," and click on "Add Attachment" to attach it.

The purpose of the Project Summary/Abstract is to communicate the overall sense of the combined Phase I and Phase II project, not every step of the work plan or every accomplishment.

Statements of future applications or benefits belong in the section on Commercial Applications and Other Benefits. Do not use acronyms, abbreviations, first-person references, or any proper names (including the name of the small business, any subcontractors or institutions, or any trade or product name) in the body of the summary.

The header must include:

- Company Name
- Project Title
- Principal Investigator
- Topic number/Subtopic letter, e.g. 12b

The body must include:

- Statement of the problem or situation that is being addressed in your application. Describe the problem or situation being addressed—be sure that the DOE interest in the problem is clear, but not in such a

way that implies that any services or products are being provided for the direct benefit of DOE rather than for the advancement of a public purpose. (Typically one to three sentences).

- General statement of how this problem is being addressed. This is the overall objective of the Phase I project. How is this problem being addressed? What is the overall project approach? (Ideally, two to four sentences).
- What is to be done in Phase I? (Typically three to four sentences).
- Commercial Applications and Other Benefits (limited to the space provided). Summarize the future applications or public benefits if the project is carried over into Phase II or Phase III and beyond. Do not repeat information already provided above.
- Key Words - Provide listing of key words that describe this effort.
- Summary for Members of Congress: (layman's terms, two sentences, maximum 50 words). DOE notifies members of Congress of grants in their districts. Therefore, please provide, in clear and concise layman's terms, a very brief summary of the project, suitable for a possible press release from a Congressional office. One suggested format is to use two sentences: The first sentence should state the problem being addressed so that the research need is clear, and the second sentence should state what is being done to address that problem.

Project Narrative: (Field 8 on the form) [MANDATORY]

The Project Narrative is considered the main portion of the grant application and must specify clear, measurable goals and milestones that should be achieved in Phase I.

Phase I applications must propose research and development required to meet the DOE objectives stated in the technical topic of the FOA and provide sufficient information to convince DOE and members of the research community who review the application that it is worthy of support under the stated evaluation criteria in Part V.

For Phase I there is a 15 page, 7,500 words of text limitation on the Project Narrative, which includes the cover page. Please note that the word limit applies to the text in the body of the Project Narrative and does not include words in tables and graphs. Also, sections such as the budget, budget justification, key personnel, and commercialization plan should not be included in the Project Narrative but attached in the appropriate fields for those forms.

The application should be written succinctly using the outline below. To attach a Project Narrative, click "Add Attachment."

Using the outline below, the Project Narrative must include ALL of the following:

- Cover page – Provide company-specific and project information including company name and address, principal investigator, project title, topic number, and subtopic letter.

- Proprietary Data Legend (Proprietary Application Information – Trade Secrets, Commercial, or Financial Information) – If applicable, see Part VIII, Section D. If your application contains trade secrets or commercial or financial information, you must include the Notice of Restriction on Disclosure and Use of Data on the first page of your Project Narrative in accordance with guidance under Part VIII, D. Proprietary Application Information - Trade Secrets, Commercial or Financial Information of this FOA.

- Identification and Significance of the Problem or Opportunity, and Technical Approach – Define the specific technical problem or opportunity addressed by your application. Provide enough background information so that the importance of the problem/opportunity is clear. Indicate the overall technical approach to the problem/opportunity and the part that the proposed research plays in providing needed results.

- Anticipated Public Benefits – Discuss the technical, economic, social, and other benefits to the public as a whole anticipated if the project is successful and is carried over into Phases II and III. Identify specific groups in the commercial sector as well as the Federal Government that would benefit from the projected results. Describe the resultant product or process, the likelihood that it could lead to a marketable product, and the significance of the market.

- Technical Objectives - State the specific technical objectives for the Phase I research and development.

- Work Plan – This section should be a substantial part of the application. Provide an explicit, detailed description of the Phase I research approach and work to be performed. Indicate what will be done, the qualifications of the team (principal investigator, key personnel, subcontractors and consultants) to execute the project, where it will be done, and how the work will be carried out.

  Link the Work Plan to the Technical Objectives of the proposed project. Discuss methods planned to achieve each objective or task explicitly and in detail. Be sure to address how the research or research and development effort could lead to a product, process, or service if funded beyond Phase I. Show how the management direction and control of the project will be assured. Regardless of the proportion of the work or funding of each of the performers under the grant, the applicant is to be the primary grantee with overall responsibility for its performance.

- Performance Schedule - The Phase I budget period may be less than, but no longer than 12 months. Briefly describe the important milestones to be achieved and the estimated amount of time for completing each task described in the Work Plan. Please be aware that your Phase II application will be due approximately 9.5 months after the project start date. Critical milestones that will be important to include in your Phase II application should be completed in the first 9 months of your project.

- Facilities/Equipment - Describe available equipment and physical facilities necessary to carry out the Phase I effort. Equipment is defined as an article of tangible, nonexpendable, personal property, including exempt property, charged directly to the grant, having a useful life of more than one year and an acquisition cost of $5,000 per unit or more. Items of equipment to be leased or purchased must be described and justified in this section. Title to equipment purchased under this grant lies with the government. It may be transferred to the grantee where such transfer would be more cost effective than recovery of the property by the government. Grantees wishing to obtain title should contact their contract specialist prior to project completion for the procedure to follow to make such a request. If the equipment, instrumentation, and facilities are not the property of the applicant and are not to be purchased or leased, the source must be identified and their availability and expected costs specifically confirmed in this section. A principal of the organization that owns or operates the facilities/equipment must provide written verification regarding the availability and cost of facilities/equipment and any associated technician cost. Small businesses may get credit for obtaining this equipment as an in-kind Phase II commercial contribution.

American-Made - To the extent possible in keeping with the overall purposes of the program, only American-made equipment and products should be purchased with the funds provided by the financial assistance under DOE Phase I grants.

- Research Institution (RI) - If the grant application contains formal collaboration with an RI (required for STTR, optional for SBIR), (1) identify the name and address of the institution, the name, phone number, and email address of the certifying official from the RI, and the total dollar amount of the subcontract; (2) describe in detail the work to be done by this RI in the Work Plan section; and (3) provide a detailed cost estimate including costs for labor, equipment, and materials, if any, as well as a specific statement certifying that they have agreed to serve in the manner and to the extent described in the Work Plan section of the grant application" from RIs.

  The RI will be considered a subcontractor to the applicant. The RI must provide a Letter of Commitment (LOC) on official letterhead from an authorized representative of the RI which commits the institution to participate in the project as described in the application. The LOC should be attached as an "Other Attachment" in field 12, on the Research & Related Other Project Information form. If selected for a grant, participation of the RI will be verified by the DOE contracting officer.

- Other Consultants and Subcontractors - Involvement of consultants or subcontractors in the project is permitted provided the work is performed in the United States, for exceptions, see Part III. D. If consultants and/or subcontractors are to be used, this section of the application must identify them by name, identify whether the party is being proposed as a consultant versus as a subcontractor, and should provide Letters of Commitment (LOC) from an authorized representative of the consultants and/or subcontractors. The LOC must provide a detailed cost estimate, including costs for labor, equipment, and materials, if any, for the consultant or subcontractor, as well as a specific statement certifying that the consultant(s) or subcontractor(s) have agreed to serve in the manner and to the extent described in the Work Plan section of the application. Each LOC must be on official letterhead with an authorizing representative's contact information provided and submitted as an "Other Attachment" to the application. If selected for a grant, the DOE contracting officer will verify the participation of any subcontractor(s) and/or consultant(s) and will require budget and budget explanations for subcontractors and verification of the rates for consultants.

- Phase II Funding Commitment (Commercial Contribution) [OPTIONAL] - While not a requirement to obtain Phase I funding, applicants are strongly encouraged to submit commitments from the private sector or from non-SBIR/STTR funding sources, which will be considered as part of the evaluation criterion on "Impact". Add as an attachment in field 12, "Other Attachments", on this form.

- Phase III Follow-On Funding Commitment [OPTIONAL] - Applicants are encouraged to submit a Phase III follow-on funding commitment which will be considered as part of the evaluation criterion on Impact. The commitment must be signed by a person with the authority to make it, indicate when the funds will be made available, and contain specific technical objectives which will make the commitment exercisable by the applicant. If the commitment is firm regardless of achievement of technical objectives, it should state so. The commitment may include: (1) third party financing; (2) self-financing (in which case the applicant must demonstrate the ability to provide the Phase III funding); (3) state or local government financing; or (4) federal funding. In-kind contributions are allowed; however, the applicant or donor must estimate the dollar value of any in-kind contribution. The Phase III funding cannot be contingent on obtaining a patent because of the length of time this process requires. The

Phase III Commitment must be submitted with the Phase I application as a separate attachment. Add as an attachment in field 12, "Other Attachments", on this form. You should also reference it in the technical proposal in the "Work Plan" Section.

- Bibliography & References Cited (Field 9 on this form) - Do not attach a file in this field. Include this information, if any, in the Phase I Project Narrative. Bibliography and References cited count against the Phase I Project Narrative 15 page limit.

- Facilities & Other Resources (Field 10 on this form) - Do not attach a file in this field. Include this information, if any, in the Project Narrative. Facilities and Other Resources information counts against the Phase I Project Narrative 15 page limit.

- Equipment (Field 11 on this form) - Do not attach a file in this field. Include this information, if any, in the Project Narrative. Equipment information counts against the Phase I Project Narrative 15 page limit.

OTHER ATTACHMENTS: (FIELD 12 ON THIS FORM)

Note: Field 12 will hold more than one attachment. If you need to elaborate on your responses to questions 1 – 6 on the "Other Project Information" form, provide the information in a single file named "projinfo.pdf." Click on "Add Attachments" in Field 12 to attach file.

Phase I Commercialization Plan (Required)

A brief Commercialization Plan (4 pages maximum) must be included in a Phase I grant application. If the Commercialization Plan is not included at the time of application submission, your application will be administratively declined without review. The Commercialization Plan will be evaluated under the "Impact" criterion and should address the following elements:

Project Title

- You MUST include the following statement after your project title:

"(COMPANY NAME HERE) estimates cumulative sales revenues of $_____ and cumulative licensing revenues of $_____ during the first 10 years of commercialization."

Market Opportunity: Describe the market opportunity being addressed.

- Intellectual Property (IP): Describe the status of patents, trade secrets, and other steps you plan to take to protect your IP for commercialization.

- Company/Team: Describe the capability of your present personnel and/or planned additions to your staff that will enable you to successfully commercialize your innovation.

Although Phase I applications must only address the elements listed above, Applicants are encouraged to review the example of a Phase I Commercialization Plan on the DOE SBIR/STTR website, under "Applicant Resources" on the DOE SBIR/STTR website at https://science.energy.gov/sbir/applicant-resources/grant-application/.

At this time, Question 7 of the SBIR/STTR Information Form will not accept an attachment for a Phase I grant application submission. To address this form issue, please create a document entitled, "Commercialization Plan" and attach this file in Field 12 of the Research & Related Other Project Information Form.

Please Note: All applications lacking a separate and attached Phase I Commercialization Plan as noted above will be administratively declined and will not undergo further review or consideration for award.

Digital Data Management Plan Requirement (Required)

All SBIR and STTR applicants must select one of the following options for their Data Management Plan (DMP):

Option 1)
The Option 1 DMP is: "It is anticipated that all generated digital data will be protected as SBIR/STTR data and therefore will not be publicly shared during the applicable SBIR/STTR data protection period. If any data generated under this award are published, an effort will be made to also release any related digital data that is not protected SBIR/STTR data." Applications that select Option 1 must not include publication costs in their budget, as this implies that data will be shared publicly.

Please note that if you do not include a DMP with your application, Option 1 for the DMP will be assumed for your application. However, if you plan to publicly disclose generated digital data, you must provide a DMP under Option 2.

Option 2)
If you plan to publicly disclose technical data during the data protection period or, for data not expected to be asserted as protected SBIR/STTR rights data , please submit a DMP using the requirements below.

1. DMPs should describe whether and how data generated in the course of the proposed research will be shared and preserved. If the plan is not to share and/or preserve certain data, then the plan must explain the basis of the decision (for example, cost/benefit considerations, other parameters of feasibility, scientific appropriateness, or limitations discussed in #4 below). At a minimum, DMPs must describe how data sharing and preservation will enable validation of results, or how results could be validated if data are not shared or preserved.

2. DMPs should provide a plan for making all research data displayed in publications resulting from the proposed research digitally open, machine-readable and digitally accessible to the public at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible to the public in accordance with the principles stated in the Office of Science Statement on Digital Data Management (http://science.energy.gov/funding-opportunities/digital-data-management/). This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

3. DMPs should consult and reference available information about data management resources to be used in the course of the proposed research. In particular, DMPs that explicitly or implicitly commit data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for

data management at Office of Science User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP.

4. DMPs must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all applicable laws and regulations. There is no requirement to share proprietary data.

Additional DMP Guidance

- In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements noted above, and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

- DMPs should reflect relevant standards and community best practices for data and metadata, and make use of community accepted repositories whenever practicable.

- Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

- To improve the discoverability of and attribution for datasets created and used in the course of research, the applicant is encouraged to cite publicly available datasets within the reference section of publications, and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, the Office of Science can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service.

- The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:
  - Data Types and Sources. A brief, high-level description of the data to be generated or used through the course of the proposed research and which of these are considered digital research data necessary to validate the research findings.
  - Content and Format. A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. (Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies that facilitate sharing, and should advise the sponsoring program of any need to develop or generalize standards.)

- Sharing and Preservation. A description of the plans for data sharing and preservation. This should include, when appropriate:
  - the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions;
  - a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published;

- any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited;
- any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation. (This could reference the relevant section of the associated research proposal and budget request);
- cost/benefit considerations to support whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation;
- whether, when, or under what conditions the management responsibility for the research data will be transferred to a third party (e.g. institutional, or community repository);
- any other future decision points regarding the management of the research data including plans to reevaluate the costs and benefits of data sharing and preservation.

- Protection. A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

- Rationale. A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

Also, attach the following files in Field 12:

- SBA Company Registration (Required)
- Signed Letter of Funding Commitment, if applicable
- Phase III Follow-On Funding Commitment, if applicable
- Signed Letter of Commitment (LOC) from research institution, as applicable. LOC must include name and address of institution, dollar amount of subcontract, and certifying official's name, phone number and email address.
- LOC from consultants, subcontractors or other third parties.
- Level-of-Effort Worksheet (discussed in Part III) may be found on the DOE SBIR/STTR Programs web site at https://science.energy.gov/sbir/applicant-resources/grant-application/.

RESEARCH AND RELATED SENIOR/KEY PERSON: [MANDATORY]

Complete this form before the Budget form to populate data on the Budget form.

Principal Investigator and other Key Personnel - The Principal Investigator (PI) is the key individual designated by the applicant to direct the project. Only one PI is acceptable per project. The PI and Key Personnel do not need to be U.S. citizens; however, all work must be performed in the United States, for exceptions, see Part III. D. See "General Requirements and Restrictions on the Principal Investigator" in Part III. H.

Beginning with the PI, provide a profile for each senior/key person proposed. Each senior/key person must be aware that he/she is included in the application and must agree to perform the work if awarded. A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual. Sub-awardees and consultants must be included if they meet this definition. For each senior/key person provide:

Biographical Sketch

Complete a biographical sketch for each senior/key person and attach to the "Attach Biographical Sketch" field in each profile. The biographical sketch(es) provided must be current and accurate as of the application submittal date. The biographical information for each person must not exceed 2 pages and must include:

- Education and Training - Undergraduate, graduate and postdoctoral training—provide institution, major/area, degree and year.
- Research and Professional Experience - Beginning with the current position, in chronological order, list any professional/academic positions with a brief description.
- Publications - Provide a list of up to 10 publications most closely related to the proposed project. For each publication, identify the names of all authors (in the same sequence in which they appear in the publication), the article title, book or journal title, volume number, page numbers, and year of publication. Though not used for application evaluation purposes, provide a website address if available electronically.
- Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications
- Synergistic Activities - List no more than five (5) professional and scholarly activities related to the effort proposed.

Current and Pending Support

Provide a list of all current and pending support (both Federal and non-Federal) for the Project Director/Principal Investigator (PD/PI) and senior/key persons, including sub-awardees, for ongoing projects and pending applications. For each organization providing support, show the total grant amount for the entire grant period (including indirect costs) and the number of person-months per year to be devoted to the project by the senior/key person. Concurrent submission of an application to other organizations for simultaneous consideration will not prejudice its review. Save the information in a separate file and attach to the "Attach Current and Pending Support" field in each profile.

RESEARCH AND RELATED BUDGET: [MANDATORY]

You must provide a budget for the period of support requested and a cumulative budget for the total project. In accordance with the SBIR/STTR topic funding allowance, applicants may request funding for up to 12 months, but not less than 6 months. Any application that proposes less than a 6 month Phase I budget period will be revised upward to 6 months by DOE. The amount budgeted cannot exceed the Phase I maximum grant amount for the topic. In the event you choose to use your own commercialization vendor, you may exceed the topic amount by up $5,000. Please refer to the Commercialization Assistance section for guidance.

Complete the Research and Related Budget form in accordance with the instructions on the form and the following instructions. The form will generate a cumulative budget for the total project period. You may request funds under any of the categories listed as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allow ability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA (See Part IV). Note that foreign travel and participant/trainee costs are typically considered unallowable costs unless approved by the DOE Contracting officer.

Phase I Principal Investigator meeting: Applicants may include in their Phase I budget a registration fee ($250) and travel expenses for the Principal Investigator and, if necessary, a person from the small business representing the commercialization interests of the company to attend the DOE SBIR/STTR Phase I Principal

Investigator Meeting. Attendance by the Principal Investigator is expected. This two-day meeting, held in the DC metro area, will provide opportunities to meet with DOE Program Managers and Commercialization Assistance providers, as well as learn about the DOE SBIR/STTR programs, with an emphasis on the Phase II application. The DOE SBIR/STTR Phase I Principal Investigator Meeting will be held approximately 4 months after the Phase I period of performance begins. Principal Investigators will be notified of the exact date and venue for the DOE SBIR/STTR Phase I Principal Investigator Meeting approximately 8 weeks after the Phase I grant start date by an e-mail from the DOE contractor managing the meeting. The email will contain the URL for the DOE SBIR/STTR Phase I Principal Investigator Meeting website, where participants will be able to register, make lodging reservations, and view the agenda for the meeting.

Commercialization Assistance (Section F, Field 8, 9, or 10 [Optional])

In accordance with the SBIR/STTR Reauthorization Act of 2011, the DOE is able to fund discretionary commercialization assistance to all DOE SBIR and STTR Phase I grantees. Grant recipients have two options for receiving commercialization assistance: (1) utilize services provided by a DOE vendor or (2) identify their own commercialization assistance provider.

If you wish to receive commercialization assistance from a DOE-funded vendor, you do not need to include this in your budget. If you are awarded a Phase I grant, you will receive notification from DOE and follow-up contact from a DOE-funded vendor on what services are available to you and how to obtain these services at no cost to your small business.

If you wish to utilize your own commercialization assistance provider, you are required to include this as "Other Direct Costs (in fields 8, 9 or 10 of Section F)" in your budget, to provide a detailed budget justification, and a letter of commitment from the provider. You may include up to $5,000 for assistance. Please note that this commercialization assistance does not count toward the maximum grant size listed in Part II, C. For example, seeking commercialization assistance from your provider could result in an increase of $5,000 over the maximum grant limit. That is, for a topic with a maximum grant limit of $150,000 or $225,000, the actual grant may increase to $155,000 or $230,000 respectively. Reimbursement is limited to services received that comply with 15 U.S.C. § 638(q). In the event some or the entire amount listed is not expended on a commercialization assistance services as proposed, the remaining funds cannot be budgeted to other project costs. Re-budgeting of these funds is not allowable.

Budget Justification (Field K on the form): [MANDATORY]

Provide supporting information for all proposed costs, including hours and rates for all personnel. Attach a single budget justification file for the entire project period in Field K. Provide any other information you wish to submit to justify your budget request. If your organization has an Indirect Cost Rate Agreement (ICRA) in effect with your Cognizant Federal Agency [Defense Contract Audit Agency (DCAA), Department of Health and Human Service's Division of Cost Allocation (DCA), etc.] supporting the indirect rate(s) proposed, please provide this information with your application if the rate agreement (a) is dated no later than 2015 and (b) covers the proposed period of activity. Please note that if you are selected for a grant, additional budget explanation will most likely be required.

Note: All proposed purchase of equipment will be carefully reviewed relative to need and appropriateness for the research or R&D proposed. Although there is no absolute cap on indirect costs, grant applications will be evaluated for overall economy and value to DOE.

- Travel funds must be justified and related to the needs of the project, e.g., travel to DOE Headquarters to meet with the DOE Program Manager. Travel expenses for technical conferences are not permitted unless the purpose of attending the conference directly relates to the project, e.g., to present results of the project. Foreign travel is not normally an appropriate expense. Funds to cover travel expenses outside of the United States are considered an unallowable direct cost unless written approval has been obtained from the DOE contracting officer.
- Phase I grant funds may not be used to pay patent filing fees and related filing expenses for the first U.S. patent for subject inventions developed under the Phase I project.
- Tuition expenses are allowable only if requested from a research institution or subcontractor that is a university, provided the amount requested for tuition is reasonable and comparable to what a student would be paid for performing research during the grant performance period.
- Any commercial and/or in-kind contribution to the project should be reflected in the project narrative and not included on the budget pages.
- Round all funds to the nearest dollar.

R&R SUBAWARD BUDGET ATTACHMENT(S) FORM: [IF APPLICABLE, BUDGETS FOR SUB-AWARDEES, INCLUDING RESEARCH INSTITUTIONS]

You must provide a SF 424 (R&R) budget and budget justification for any Phase I sub-awardee.

Download the R&R Budget Attachment from the R&R SUB-AWARD BUDGET ATTACHMENT(S) FORM and email it to each sub-awardee that is required to submit a separate budget. After the sub-awardee has emailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the sub-awardee's name (plus.pdf) as the file name (e.g., ucla.pdf or energyres.pdf). You may enter the sub-awardee budget information on a separate budget extracted from the SUB-AWARD BUDGET ATTACHMENT(S) FORM.

If the project involves more sub-awardees than there are places in the SUB-AWARD BUDGET ATTACHMENT(S) FORM, the additional sub-award budgets may be saved as PDF files and appended to the Budget Justification attached to Field K.

Ensure that any files received from sub-awardees are the PDF files extracted from the SUB-AWARD BUDGET ATTACHMENT(S) FORM. Errors will be created if a sub-awardee sends a prime applicant a budget form that was not extracted from the application package. Do not use a sub-award budget downloaded directly from grants.gov or any source other than the application package.

Additional budget information for any sub-awardee will likely be required if selected for award.

SF-LLL DISCLOSURE OF LOBBYING ACTIVITIES: [OPTIONAL]

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit SF-LLL "Disclosure Form to Report Lobbying."

SBIR/STTR OTHER PROJECT INFORMATION FORM: [MANDATORY]

Complete all the required forms in accordance with the pop-up instructions on the form.

Commercialization History (Field 8, if applicable)

If you have received SBIR/STTR Phase II grants from any Federal agency, then you must provide your company Commercialization History. To assist applicants in providing a Commercialization History, an MS Excel template can be found on the DOE SBIR/STTR Programs Office web site at https://science.energy.gov/sbir/applicant-resources/grant-application/. Please create a document entitled "Commercialization History".

Improper Contents of Applications

Applications submitted under this FOA will be stored in controlled-access systems, and require that improper material be excluded and proprietary information be clearly marked. It is critical that applicants follow these guidelines:

- Do not include information subject to any legal restriction on its open distribution, whether classified, export control, or unclassified controlled nuclear information.
- Do not include personally identifiable information, including social security numbers, birthdates, citizenship, marital status, or home addresses. Pay particular attention to the content of biographical sketches and curriculum vitae.
- Do not include letters of support from Federal officials.
- Do not include letters of support on Federal letterhead. Letters that are not letters of support (such as letters confirming access to sites, facilities, equipment, or data; or letters from cognizant contracting officers) may be on Federal letterhead.
- Clearly mark all proprietary or trade-secret information. (See Part VIII. D.)
- Applicants should not include the DOE logo or seal in their applications. Use of the DOE logo and seal require permission of DOE as discussed on the DOE website: https://energy.gov/management/office-management/employee-services/graphics/doe-logo-seal-and-word-mark.

E. SUBMISSIONS FROM SUCCESSFUL PHASE I APPLICANTS

If selected for a grant, DOE reserves the right to request additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the "Designated Responsible Employee" for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)
- Representation of Limited Rights Data and Restricted Software, if applicable
- Representation Concerning Financial Management System
- Consultant documentation/verification of rates
- ES&H Information

SBIR/STTR CERTIFICATIONS

If selected for a Phase I grant, applicants will be required to sign and submit one or more certification forms. These forms will be provided by a DOE contract specialist or DOE grants management specialist during grant negotiation.

STTR PROPERTY AND COMMERCIALIZATION AGREEMENTS

If selected for a Phase I STTR grant, an applicant will need to certify that they have a Property and Commercialization Rights Agreement in place with the partnering Research Institution. The following

hyperlinked documents are provided for information purposes only and are subject to changes and updates prior to grant negotiation:

- Property and Commercialization Rights Agreement Certification
- DOE STTR Model Agreement for Property and Commercialization Rights

F. SUBMISSION DATES AND TIMES

LETTER OF INTENT

An LOI must be received from the SBC no later than January 8, 2018 5:00 PM Eastern Time.

PRE-APPLICATION

A Pre-Application is not required.

APPLICATIONS

Applications must be received by February 26, 2018, 11:59 PM Eastern Time. The Grants.gov system may be unable to accept applications in bulk on or near the deadline: You are highly encouraged to transmit your application well before the 11:59 PM Eastern Time deadline.

Unsolicited grant applications will not be accepted. Any submission incorporating data affecting the national security will not be accepted for evaluation. Modifications will be accepted if received before the deadline.

LATE SUBMISSIONS

Delays in submitting LOIs or applications may be unavoidable. DOE has accepted late submissions when applicants have been unable to make timely submissions because of technological disruptions or large scale natural disasters. Other circumstances will not justify late submissions. Examples of unacceptable justifications are provided below:

- Failure to begin submission process early enough
- Failure to provide sufficient time to complete the process
- Failure to understand the submission process
- Failure to understand the deadlines for submissions
- Failure to satisfy prerequisite registrations
- Unavailability of administrative personnel

Applicants must email the Agency Contact listed in PART I of this FOA (sbir-sttr@science.doe.gov within 24 hours of the submission deadline) to request a late submission.

Requests for late submissions may be accepted at the sole discretion of DOE.

Late applications will only be accepted from applicants that have received permission, and only one such request will be permitted.

G. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372—Intergovernmental Review of Federal Programs.

H. FUNDING RESTRICTIONS

Funding for all awards and future budget periods are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the available future-year budget authority.

FEE

Grants may include a profit or fee for the applicant. Fees are subject to negotiation and shall not exceed 7% of the total award amount. Profit or fee is not "program income" and shall not be included in field 15.d. of the SF 424 (R&R) application. The fee applies solely to the small business concern receiving the award and for-profit R&D subcontractors participating in the project. In addition, the grantee may pay a profit/fee to a contractor providing routine goods or non-R&D services in accordance with normal commercial practice.

COST PRINCIPLES

Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation).

PRE-AWARD COSTS

Recipients may charge to an award resulting from this FOA pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation). Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

INDIRECT COSTS

Indirect costs are normally a component of a project budget and derive from an applicant's Indirect Rate(s), established in accordance with its financial management system. Experience has shown that creating and supporting these rates can be one of the most problematic elements of a budget, and the subsequent negotiation of costs for the project. Applicants are encouraged to be proactive in ensuring that all proposed rates are established in a timely manner and in accordance with applicable cost principles. If you are selected for a grant, establishing the acceptability of your proposed indirect costs, if any, is essential to the review of your budget and may take various forms, including: 1) An Indirect Cost Rate Agreement (ICRA) in effect with your Cognizant Federal Agency, which covers the period of performance of this grant and supports the indirect rate(s) proposed; 2) If no ICRA exists, an Indirect Cost Rate Proposal may be submitted to DOE for evaluation; or 3) indirect rates that have been accepted for estimating purposes by DOE or another Federal agency for the period of performance of this grant.

If you are proposing indirect costs and do not already have an Indirect Cost Rate Agreement with your Cognizant Federal Agency or documentation of rates accepted for estimating purposes by DOE or another Federal agency, it is recommended that you begin preparing an Indirect Cost Rate Proposal to be submitted, upon request, to the DOE contract specialist/grants management specialist who will evaluate your application if you are selected for award.

For your convenience in preparing an Indirect Cost Rate proposal, links are provided below to the document titled "Guidance for Indirect Rate Submission", to the "Simple Indirect Rate Model" in Microsoft Excel format, and to the "Indirect Rate Presentation".

- Guidance for Indirect Rate Submission
- Simple Indirect Rate Model in Excel Format
- Indirect Rate Presentation (Complete the registration information to view the presentation)

I. REQUIRED REGISTRATIONS

There are several one-time actions you must complete in order to submit an application in response to this FOA (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the System for Award Management (SAM), and register with Grants.gov). Those applicants not registered with SAM and/or Grants.gov must understand that it may take up to 44 days to complete these requirements. It is suggested that you begin the registration process well before 44 days.

Applicants must obtain a DUNS number at http://fedgov.dnb.com/webform.

Applicants must register with SAM at www.sam.gov/. More information about SAM registration for applicants is found using the Help tab on the SAM website. Remember you have to update your SAM registration annually.

Applicants must provide a Taxpayer Identification Number (TIN) to complete their registration in SAM.gov. An applicant's TIN is an Employer Identification Number (EIN) assigned by the Internal Revenue Service (IRS). In limited circumstances, a Social Security Number (SSN) assigned by the Social Security Administration (SSA) may be used as a TIN. You may obtain an EIN from the IRS at www.irs.gov/Businesses/Small-Businesses-%26-Self-Employed/Apply-for-an-Employer-Identification-Number-(EIN)-Online.

DOE highly discourages the use of a SSN as a TIN. DOE suggests applicants obtain a TIN from the IRS using the website listed above.

Applicants must register with FedConnect at www.fedconnect.net. If an award is made, the full and binding version of the assistance agreement between your institution and the Department of Energy (DOE) will be posted to FedConnect.

Recipients must register with the Federal Funding Accountability and Transparency Act Sub-award Reporting System at www.fsrs.gov. This registration must be completed before an award may be made; you are advised to register while preparing your application.

All SBIR/STTR applicants are required to complete the U.S. Small Business Administration (SBA) company registration process prior to submitting an SBIR or STTR application. You may complete the SBA Company Registration by going to https://sbir.gov/registration. Completed registrations will receive a unique small business Control ID and .pdf file to be used for SBIR or STTR submissions at any of the 11 participating agencies. Please refer to Part IV, Section C. for guidance on where to attach this form within your application.

During the registration process, small businesses have the opportunity to review the basic rules on eligibility based on the recently issued small business size rule. Because these issues can get complex, the SBA created additional resources to help you understand the new size rules and company registry, including a checklist to quickly determine eligibility and a Frequently Asked Questions (FAQ) resource web page.

Additionally, the SBA has put together a compliance guide to help you understand the necessary certifications needed and has provided numerous examples on various ownership and control requirements.

J. REGISTERING IN GRANTS.GOV

Applicants must register with Grants.gov. There are three (3) steps to this process.

- The Authorized Organizational Representative (AOR) must register at https://apply07.grants.gov/apply/OrcRegister
- An email is sent to the E-Business (E-Biz) POC listed in SAM. The E-Biz POC must approve the AOR registration using their MPIN from their SAM registration.
- AOR verifies that registration was completed at http://grants.gov/applicants/applicant_profile.jsp.

More information about the above steps is provided at www.grants.gov/web/grants/applicants/organization-registration.html

For organizations, please follow the procedures detailed below, making use of the checklist provided below:
www.grants.gov/web/grants/applicants/organization-registration.html
www.grants.gov/web/grants/learn-grants/grants-101/getting-started-checklist.html

For individuals, please follow the procedures detailed below:
www.grants.gov/web/grants/applicants/individual-registration.html

Organizations and individuals must have an E-Business (E-Biz) Point of Contact (POC). See
http://www.grants.gov/web/grants/applicants/organization-registration/step-4-aor-authorization.html

Grants.gov maintains a User Guide at
http://www.grants.gov/help/html/help/index.htm?callingApp=custom#t=Get_Started%2FGet_Started.htm and a list of Frequently Asked Questions at www.grants.gov/web/grants/applicants/applicant-faqs.html.

Questions relating to the registration process, system requirements, or how an application form works must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov.

FIRST-TIME REGISTRATION PROCESS IN GRANTS.GOV

You must complete the one-time registration process (all steps) before you can submit your first application through www.grants.gov. (See http://www.grants.gov/web/grants/applicants/apply-for-grants.html). We recommend that you start this process at least six weeks before the application due date. It may take 44 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at www.grants.gov/web/grants/applicants/organization-registration.html to guide you through the process. IMPORTANT: During the SAM registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner Identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four e-mails are:

Number 1 - Grants.gov Submission Receipt Number
Number 2 - Grants.gov Submission Validation Receipt for Application Number
Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number
Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

IMPORTANT NOTICE: When you have completed the Grants.gov registration process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., grants.gov registration).

K. DOE OFFICE OF SCIENCE PORTFOLIO ANALYSIS AND MANAGEMENT SYSTEM

After you submit your application through Grants.gov, the application will automatically transfer into PAMS for processing by the DOE Office of Science (SC). Many functions for grants and cooperative agreements can be done in PAMS, which is available at https://pamspublic.science.energy.gov/.

You will want to "register to" your application: a process of linking yourself to the application after it has been submitted through grants.gov and processed by DOE.

You must register in PAMS to submit a pre-application or a letter of intent.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Notifications sent from the PAMS system will come from the PAMS email address <PAMS.Autoreply@science.doe.gov>. Please make sure your email server/software allows delivery of emails from the PAMS email address to yours.

Registering to PAMS is a two-step process; once you create an individual account, you must associate yourself with ("register to") your institution. Detailed steps are listed below.

CREATE PAMS ACCOUNT:

To register, click the "Create New PAMS Account" link on the website https://pamspublic.science.energy.gov/.

- Click the "No, I have never had an account" link and then the "Create Account" button.
- You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the "Save and Continue" button.
- On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the "Create Account" button.
- Read the user agreement and click the "Accept" button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
- PAMS will take you to the "Having Trouble Logging In?" page. (If you have been an SC merit reviewer or if you have previously submitted an application, you may already be linked to an institution in PAMS. If this happens, you will be taken to the PAMS home page.)

REGISTER TO YOUR INSTITUTION:

- Click the link labeled "Option 2: I know my institution and I am here to register to the institution." (Note: If you previously created a PAMS account but did not register to an institution at that time, you must click the Institutions tab and click the "Register to Institution" link.)
- PAMS will take you to the "Register to Institution" page.
- Type a word or phrase from your institution name in the field labeled, "Institution Name like," choose the radio button next to the item that best describes your role in the system, and click the "Search" button. A "like" search in PAMS returns results that contain the word or phrase you enter; you do not need to enter the exact name of the institution, but you should enter a word or phrase contained within the institution name. (If your institution has a frequently used acronym, such as ANL for Argonne National Laboratory or UCLA for the Regents of the University of California, Los Angeles, you may find it easiest to search for the acronym under "Institution Name like." Many institutions with acronyms are listed in PAMS with their acronyms in parentheses after their names.)
- Find your institution in the list that is returned by the search and click the "Actions" link in the Options column next to the institution name to obtain a dropdown list. Select "Add me to this institution" from the dropdown. PAMS will take you to the "Institutions – List" page.
- If you do not see your institution in the initial search results, you can search again by clicking the "Cancel" button, clicking the Option 2 link, and repeating the search.
- If, after searching, you think your institution is not currently in the database, click the "Cannot Find My Institution" button and enter the requested institution information into PAMS. Click the "Create Institution" button. PAMS will add the institution to the system; associate your profile with the new institution, and return you to the "Institutions – List" page when you are finished.

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001771.

SC encourages you to register in all systems as soon as possible. You are also encouraged to submit letters of intent, pre-applications, and applications before the deadline.

VIEWING SUBMITTED APPLICATIONS

Each Grants.gov application submitted to the DOE Office of Science (SC) automatically transfers into PAMS and is subsequently assigned to a program manager. At the time of program manager assignment, the three people listed on the SF 424 (R&R) cover page will receive an email with the subject line, "Receipt of Proposal 0000xxxxxx by the DOE Office of Science." These three people are the Principal Investigator (Block 14), Authorized Representative (Block 19), and Point of Contact (Block 5). In PAMS notation, applications are known as proposals, the Principal Investigator is known as the PI, the Authorized Representative is known as the Sponsored Research Officer/Business Officer/Administrative Officer (SRO/BO/AO), and the Point of Contact is known as the POC.

There will be a period of time between the application's receipt at Grants.gov and its assignment to a DOE Office of Science program manager. Program managers are typically assigned two weeks after applications are due at Grants.gov: please refrain from attempting to view the proposal in PAMS until you receive an email providing the assignment of a program manager.

Once the email is sent, the PI, SRO/BO/PO, and POC will each be able to view the submitted proposal in PAMS. Viewing the proposal is optional.

You may use the Internet Explorer, Firefox, Google Chrome, or Safari browsers to access PAMS.

Following are two sets of instructions for viewing the submitted proposal, one for individuals who already have PAMS accounts and one for those who do not.

If you already have a PAMS account, follow these instructions:

1. Log in to PAMS at https://pamspublic.science.energy.gov/.
2. Click the "Proposals" tab and click "Access Previously Submitted Grants.gov Proposal."
3. Enter the following information:
   - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, "Receipt of Proposal …".
   - Email (as entered in Grants.gov application): Enter your email address as it appears on the SF 424(R&R) Cover Page.
   - Choose Role: Select the radio button in front of the role corresponding to the SF 424 (R&R) cover page. If your name appears in block 19 of the SF 424 (R&R) cover page as the authorizing representative, select "SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer)." If your name appears in block 14 of the SF 424 R&R cover page as the PI, select "Principal Investigator (PI)." If your name appears in block 5 of the SF 424 R&R as the point of contact, select "Other (POC)."
4. Click the "Save and Continue" button. You will be taken to your "My Proposals" page. The Grants.gov proposal will now appear in your list of proposals. Click the "Actions/Views" link in the options column next to this proposal to obtain a dropdown list. Select "Proposal" from the dropdown to see the proposal. Note that the steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

If you do not already have a PAMS account, follow these instructions:

1. To register, click the "Create New PAMS Account" link on the website https://pamspublic.science.energy.gov/.
2. Click the "No, I have never had an account" link and then the "Create Account" button.
3. You will be prompted to enter your name and email address, create a username and password, and select a security question and answer. Once you have done this, click the "Save and Continue" button.
4. On the next page, enter the required information (at least one phone number and your mailing address) and any optional information you wish to provide (e.g., FAX number, website, mailstop code, additional email addresses or phone numbers, Division/Department). Click the "Create Account" button.
5. Read the user agreement and click the "Accept" button to indicate that you understand your responsibilities and agree to comply with the rules of behavior for PAMS.
6. You will be taken to the Register to Institution page. Select the link labeled, "Option 1: My institution has submitted a proposal in Grants.gov. I am here to register as an SRO, PI, or POC (Sponsored Research Officer, Principal Investigator, or Point of Contact)."
7. Enter the following information:
   - Proposal ID: Enter the ten-digit PAMS proposal ID, including the leading zeros (e.g., 00002xxxxx). Do not use the Grants.gov proposal number. Use the PAMS number previously sent to you in the email with subject line, "Receipt of Proposal …".
   - Email (as entered in Grants.gov proposal): Enter your email address as it appears on the SF 424(R&R)

Cover Page.

- Choose Role: Select the radio button in front of the role corresponding to the SF 424 (R&R) cover page. If your name appears in block 19 of the SF 424 (R&R) cover page as the authorizing representative, select "SRO/BO/AO (Sponsored Research Officer/Business Officer/Administrative Officer)." If your name appears in block 14 of the SF 424 R&R cover page as the PI, select "Principal Investigator (PI)." If your name appears in block 5 of the SF 424 R&R as the point of contact, select "Other (POC)."

8. Click the "Save and Continue" button. You will be taken to your "My Proposals" page. The Grants.gov proposal will now appear in your list of proposals. Click the "Actions/Views" link in the options column next to this proposal to obtain a dropdown list. Select "Proposal" from the dropdown to see the proposal.

If you were listed as the PI on a prior submission but you have not previously created an account, you may already be listed in PAMS. If this is the case, you will be taken to the PAMS home page after agreeing to the Rules of Behavior. If that happens, follow the instructions listed above under "If you already have a PAMS account…" to access your Grants.gov proposal.

The steps above will work only for proposals submitted to the DOE Office of Science since May 2012.

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9 AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001771.

L. WHERE TO SUBMIT AN APPLICATION

Applications must be submitted through grants.gov to be considered for award.

Applicants must download the application package, application forms and instructions, from grants.gov at www.grants.gov/
(Additional instructions are provided in Part IV. A. of this FOA.)

Submit electronic applications through the "Apply for Grants" function at www.grants.gov. If you have problems completing the registration process or submitting your application, call grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

Please ensure that you have read the applicable instructions, guides, help notices, frequently asked questions, and other forms of technical support on Grants.gov.

PART V – APPLICATION REVIEW INFORMATION

A. CRITERIA

INITIAL REVIEW

Applications will be evaluated for responsiveness by DOE technical program experts to ensure that they (1) meet stated FOA requirements described in Part III - Eligibility Information, and Part IV, C. and D, (2) identify and are responsive to a topic and subtopic, (3) contain sufficient information for a meaningful technical review, (4) are for research or for research and development, (5) do not duplicate other previous or current DOE-funded work, and (6) are consistent with program area mission, policies, and other strategic and budget priorities. Applications failing to pass this initial review will be declined without further review.

MERIT REVIEW

Merit Review Criteria

DOE plans to make selections for Phase I awards from those applications judged to have the highest overall merit within their technical program area, with equal consideration given to each of the following criteria:

1. Strength of the Scientific/Technical Approach as evidenced by (1) the innovativeness of the idea and the approach, (2) the significance of the scientific or technical challenge, and (3) the thoroughness of the presentation.
2. Ability to competently carry out the project as evidenced by (1) the qualifications of the PI, other key staff, subcontractors and consultants, if any, and the level of adequacy of equipment and facilities; (2) the soundness and level of adequacy of the work plan to show progress toward proving the feasibility of the concept; and (3) the degree to which the DOE investment in the project would be justified by the level of proposed research effort.
3. Impact as evidenced by (1) the significance of the technical and/or economic benefits of the proposed work, if successful, (2) the likelihood that the proposed work could lead to a marketable product or process, (3) the likelihood that the project could attract further development funding after the SBIR or STTR project ends, and (4) the appropriateness of the data management plan for the proposed work. Please refer to Part IV, C. of this FOA for guidance on what to include in your Commercialization Plan and Commercialization History.

PROGRAM POLICY FACTORS

The Selection Official (SO) may consider program balance of funds distribution and needs of the technical programs and the applicant's performance under prior DOE SBIR/STTR awards including timely submittal of all reports.

B. REVIEW AND SELECTION PROCESS

Applications will be subject to a detailed technical evaluation by experts, both inside and outside the Government. The DOE will not fund any application for which there are weaknesses identified with respect to any of the three evaluation criteria, as determined by the review process. In addition, because the DOE supports only high quality research and development, applications will be considered candidates for funding only if they receive the highest rating with respect to at least two of the three criteria.

Each technical program area participating in the SBIR/STTR programs is provided a predetermined target number of applications that they may select for funding. The applications that are considered candidates for funding are ranked in order of the highest quality and strongest program relevance based on the results of the evaluation. The Selection Official may also consider program balance, funds distribution, needs of the technical programs and the applicant's performance under prior DOE SBIR/STTR awards including timely submittal of all reports.

REPORTING OF MATTERS RELATED TO RECIPIENT INTEGRITY AND PERFORMANCE (DECEMBER 2015):

DOE, prior to making a Federal award with a total amount of Federal share greater than the simplified acquisition threshold, is required to review and consider any information about the applicant that is in the designated integrity and performance system accessible through SAM (currently FAPIIS) (see 41 U.S.C. 2313);

The applicant, at its option, may review information in the designated integrity and performance systems accessible through SAM and comment on any information about itself that a Federal awarding agency previously entered and is currently in the designated integrity and performance system accessible through SAM;

DOE will consider any written comments by the applicant, in addition to the other information in the designated integrity and performance system, in making a judgment about the applicant's integrity, business ethics, and record of performance under Federal awards when completing the review of risk posed by applicants as described in §200.205 Federal awarding agency review of risk posed by applicants.

C. REVIEW OF RISK

Pursuant to 2 CFR 200.205, DOE may conduct an additional review of the risk posed by applications submitted under this FOA. Such review of risk may include:

- History of Performance,
- Reports and findings from audits performed under 2 CFR 200 or OMB Circular A-133, and
- Systems maintained under 2 CFR 180.
- Information available through any OMB-designated repositories of government-wide eligibility qualification or financial integrity information as appropriate.

DOE may make use of other publicly available information and the history of an applicant's performance under DOE or other Federal agency awards.

Applicants with no prior performance of DOE awards may be asked to provide information about their financial stability and or their ability to comply with the management standards of 2 CFR 200.

D. DISCUSSIONS AND AWARD

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to the following: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation); and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

E. ANTICIPATED NOTICE OF SELECTION AND GRANT START DATES

The DOE anticipates sending notice of selection in late May of 2018. The anticipated grant start date is July 2, 2018.

PART VI – AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

This FOA is intended for informational purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting SBIR or STTR grant, the terms of the grant shall control.

NOTICE OF SELECTION

Selected Applicants Notification: DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance nor does it mean award has been made. (See Part IV.G. with respect to the allowability of pre-award costs.)

Non-selected Notification: Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

NOTICE OF AWARD

An Assistance Agreement issued by the DOE contracting officer is the authorizing award document. It normally includes, either as an attachment or by reference, the following items: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by DOE; (4) 2 CFR 200 as modified by 2 CFR 910 (DOE Financial Assistance Regulation); (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget; (7) General Terms and Conditions; and (8) Federal Assistance Reporting Checklist and Instructions, which identifies the reporting requirements.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

ADMINISTRATIVE REQUIREMENTS

The administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR part 200 as amended by 2 CFR part 910 [DOE Financial Assistance Regulation] (See: www.eCFR.gov). For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR, research awards made under this funding opportunity will be subject to the government-wide Research Terms and Conditions published at https://www.nsf.gov/pubs/policydocs/rtc/rtcoverlay_march17.pdf and the DOE Agency Specific Standard Research Terms and Conditions published at https://www.nsf.gov/pubs/policydocs/rtc/agencyspecifics/doe_417.pdf. These Terms and Conditions will be incorporated in the award by reference.

DUNS AND SAM (FORMERLY CCR) REQUIREMENTS

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 25 (See: www.ecfr.gov). Grantees must keep their data at the System for Award Management (SAM) current at https://www.sam.gov/portal/SAM/#1. SAM is the government-wide system that replaced the Central Contractor

Registry (CCR). If you had an active registration in the CCR, you have an active registration in SAM. Sub-awardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime grantee before the sub-award can be issued.

SUB-AWARD AND EXECUTIVE REPORTING

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR 170. (See: www.ecfr.gov). Grantees must register with the new FSRS database and report the required data on their first tier sub-awardees. Grantees must report the executive compensation for their own executives as part of their registration profile in SAM.

PROHIBITION ON LOBBYING ACTIVITY

By accepting funds under this grant, you agree that none of the funds obligated on the grant shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 USC 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

ENVIRONMENTAL, SAFETY AND HEALTH (ES&H) PERFORMANCE OF WORK AT DOE FACILITIES

With respect to the performance of any portion of the work under this award that is performed at a DOE-owned or controlled site, the recipient agrees to comply with all State and Federal ES&H regulations and with all other ES&H requirements of the operator of such site.

Prior to the performance on any work at a DOE-Owned or controlled site, the recipient shall contact the site facility manager for information on DOE and site specific ES&H requirements.

The recipient shall apply this term to its sub-recipients and contractors.

NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

If the disclosure on the "Research and Related Other Project Information" document indicates "potential impact on the environment" or if DOE's own review indicates it, DOE may ask the applicant to provide additional information on those impacts in order to prepare a NEPA document such as an environmental assessment or environmental impact statement. If DOE determines it is necessary, this process would need to be completed, funded by and with the participation of the awardee, prior to taking any action on the proposed project that could have adverse environmental effects or that could limit the choice of reasonable alternatives. The inability to satisfy the NEPA requirements after an award would result in cancellation of the award.

TERMS AND CONDITIONS AND NATIONAL POLICY REQUIREMENTS

If a grant is awarded, the recipient must comply with the terms and conditions in the formal award document provided by the contracting officer at the time of award. The National Policy Assurances to be incorporated as award terms are located at the following web address http://energy.gov/management/downloads/national-policy-assurances-be-incorporated-award-terms.

ADDITIONAL CONDITIONS

The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms under Award Terms.

The National Policy Assurances To Be Incorporated As Award Terms are located at www.nsf.gov/bfa/dias/policy/rtc/appc.pdf

Intellectual Property Provisions. The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at: http://energy.gov/gc/standard-intellectual-property-ip-provisions-financial-assistance-awards

Lobbying Restrictions. By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 U.S.C. 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

CORPORATE FELONY CONVICTION AND FEDERAL TAX LIABILITY REPRESENTATIONS (MARCH 2014)

In submitting an application in response to this FOA the Applicant represents that:

1. It is not a corporation that has been convicted of a felony criminal violation under any Federal law within the preceding 24 months; and
2. It is not a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

For purposes of these representations the following definition applies:
A Corporation includes any entity that has filed articles of incorporation in any of the 50 states, the District of Columbia, or the various territories of the United States [but not foreign corporations]. It includes both for-profit and non-profit organizations.

CONFERENCE SPENDING (FEBRUARY 2015)

The recipient shall not expend any funds on a conference not directly and programmatically related to the purpose for which the grant or cooperative agreement was awarded that would defray the cost to the United States Government of a conference held by any Executive Branch department, agency, board, commission, or office for which the cost to the United States Government would otherwise exceed $20,000, thereby circumventing the required notification by the head of any such Executive Branch department, agency, board, commission, or office to the Inspector General (or senior ethics official for any entity without an Inspector General), of the date, location, and number of employees attending such conference.

LOBBYING RESTRICTIONS (MARCH 2012)

By accepting funds under this award, you agree that none of the funds obligated on the award shall be expended, directly or indirectly, to influence congressional action on any legislation or appropriation matters pending before Congress, other than to communicate to Members of Congress as described in 18 USC 1913. This restriction is in addition to those prescribed elsewhere in statute and regulation.

NONDISCLOSURE AND CONFIDENTIALITY AGREEMENTS REPRESENTATIONS (JUNE 2015)

In submitting an application in response to this FOA the Applicant represents that:

1. It **does not and will not** require its employees or contractors to sign internal nondisclosure or confidentiality agreements or statements prohibiting or otherwise restricting its employees or contactors from lawfully reporting waste, fraud, or abuse to a designated investigative or law enforcement representative of a Federal department or agency authorized to receive such information.
2. It **does not and will not** use any Federal funds to implement or enforce any nondisclosure and/or confidentiality policy, form, or agreement it uses unless it contains the following provisions:
   a) ''These provisions are consistent with and do not supersede, conflict with, or otherwise alter the employee obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.''
   b) The limitation above shall not contravene requirements applicable to Standard Form 312, Form 4414, or any other form issued by a Federal department or agency governing the nondisclosure of classified information.
   c) Notwithstanding provision listed in paragraph (a), a nondisclosure or confidentiality policy form or agreement that is to be executed by a person connected with the conduct of an intelligence or intelligence-related activity, other than an employee or officer of the United States Government, may contain provisions appropriate to the particular activity for which such document is to be used. Such form or agreement shall, at a minimum, require that the person will not disclose any classified information received in the course of such activity unless specifically authorized to do so by the United States Government. Such nondisclosure or confidentiality forms shall also make it clear that they do not bar disclosures to Congress, or to an authorized official of an executive agency or the Department of Justice, that are essential to reporting a substantial violation of law.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. The checklist is available at http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms under Award Forms.

Final technical reports are a required for each SBIR or STTR award. DOE will protect final technical reports containing marked SBIR/STTR data from disclosure during the data protection period. The data protection period extends from the time the final technical report is submitted to DOE for a period of 4 years. The data protection period may be extended by follow-on Phase II or Phase III awards if those follow-on awards are properly reported to DOE. At the end of the data protection period, final technical reports will be released to the public to comply with DOE statutory data dissemination requirements [Atomic Energy Act of 1954, Public Law 83-703; Energy Reorganization Act of 1974, Public Law 93-438; Department of Energy Organization Act of 1977, Public Law 95-91].

PART VII – QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of this FOA must be submitted to the Agency Contact listed below. Questions regarding DOE SBIR/STTR Topics may be submitted to the contact listed with each subtopic in the Topics document associated with this FOA located on the DOE SBIR/STTR Programs web site at http://science.energy.gov/sbir/funding-opportunities/. Topic questions may only be submitted to the DOE through the application due date found on cover of this FOA.

Questions relating to the Grants.gov registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions. Please only contact the Grants.gov help desk for questions related to Grants.gov.

For help with PAMS, click the "External User Guide" link on the PAMS website, https://pamspublic.science.energy.gov/. You may also contact the PAMS Help Desk, which can be reached Monday through Friday, 9AM – 5:30 PM Eastern Time. Telephone: (855) 818-1846 (toll free) or (301) 903-9610, Email: sc.pams-helpdesk@science.doe.gov. All submission and inquiries about this Funding Opportunity Announcement should reference DE-FOA-0001771. Please contact the PAMS help desk for technological issues with the PAMS system.

B. AGENCY CONTACTS

All GRANTS.GOV CUSTOMER SUPPORT
800-518-4726 (toll-free), support@grants.gov

PAMS CUSTOMER SUPPORT
855-818-1846 (toll-free), 301-903-9610, sc.pams-helpdesk@science.doe.gov

All other questions regarding the DOE SBIR/STTR processing of applications must be directed to the DOE SBIR/STTR Programs Office, point-of-contact: Carl Hebron at 301-903-5707, sbir-sttr@science.doe.gov

C. DEPARTMENT OF ENERGY, OFFICE OF INSPECTOR GENERAL HOTLINE:

The Office of Inspector General (OIG) maintains a Hotline to facilitate the reporting of allegations of fraud, waste, abuse, or mismanagement in DOE programs or operations. If you wish to report such allegations, you may call, send a letter, or email the OIG Hotline ighotline@hq.doe.gov. Allegations may be reported by DOE employees, DOE contractors, or the general public. OIG contact information is available at http://energy.gov/ig/services.

PART VIII – OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this FOA will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements. More information is available at www.fedconnect.net.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The contracting officer is the only individual who can make awards or commit DOE to the expenditure of public funds. A commitment by someone other than the contracting officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION – TRADE SECRETS, COMMERCIAL, OR FINANCIAL INFORMATION

An application may include technical data and other data, including trade secrets and commercial or financial information that are privileged or confidential, which the applicant does not want disclosed to the public or used by the Government for any purpose other than application and program evaluation as permitted by statute. Only the following documents may contain proprietary information: (1) the commercialization plan, (2) the project narrative, and (3) the budget justification, (4) letters of support.
To protect such data, any of the above listed documents that are uploaded as part of your application must be marked in the following manner utilizing the three (3) step process outlined below:

1. The Cover Page of the document must contain the notice below (please cut and paste):

"Pages [_____] of this document may contain trade secrets or commercial or financial information that is privileged or confidential and is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source."

"Proprietary Data Legend
Lines, paragraphs, tables, charts, and other graphics containing trade secrets, commercial, and/or financial information are marked with brackets [ ]."

Alternatively you may select: "highlighted" or "underlined text" or "a vertical line in the side margin |" in place of "brackets [ ]."

To see examples of proper IP markings, please visit the SBIR/STTR Programs web site at https://science.energy.gov/sbir/applicant-resources/protecting-your-trade-secrets/.

2. To further protect such data, each page containing trade secrets or commercial or financial information that is privileged or confidential must be specifically identified and marked with the following (please cut and paste):

"May contain trade secrets or commercial or financial information that is privileged or confidential and exempt from public disclosure."

Do not include this statement on pages that do not contain proprietary information.

3. In addition, each line or paragraph containing trade secrets or commercial or financial information that is privileged, must be marked with brackets or other clear identification, such as highlighting.

Please ensure this information is consistent with question number three (3) of the Research and Related form.

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, DOE may seek the advice of qualified non-Federal personnel as reviewers. DOE may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest agreements prior to reviewing an application.

Data contained in successful and unsuccessful applications may be used by the Government for completing studies required by Section 5137 of the SBIR/STTR Reauthorization Act of 2011. The results of these studies will be available to the public, but will not include information that identifies individual small business applicants.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

PROPERTY AND COMMERCIALIZATION RIGHTS AGREEMENTS

When using subcontractors, including research institutions, the small business is responsible for protecting its own interests with regard to the retention of intellectual property and commercialization rights.

It is in the best interest of the applicant, when collaborating with a research institution or other subcontractors, to negotiate a written agreement for allocating, between the parties, intellectual property rights, and rights to carry out any follow-on research, development, or commercialization. For STTR grants only, the applicant and the research institution must certify that this agreement has been completed. This certification will be requested by the DOE contract specialist/grants management specialist after award selection, but before the grant is signed.

A model agreement, found at https://science.energy.gov/sbir/awardee-resources/awardee-documents/, may be used or revised through negotiation between the small business and the Research Institution.

The completed agreement should not be submitted with the application, but retained by the parties to the agreement. The Federal government will not be a party to any agreement between the applicant and any subcontractor, including the STTR research institution. However, applicants are reminded that nothing in such agreements should conflict with any provisions setting forth the respective rights of the U.S. and the applicant with respect to both intellectual property rights and any rights to carry out follow-on research.

INTELLECTUAL PROPERTY INCLUDING INNOVATIONS, INVENTIONS, AND PATENTS

1. Proprietary Information—Information contained in unsuccessful applications will remain the property of the applicant. DOE will retain for three years one electronic file copy of each unsuccessful application. Public release of information in any application submitted will be subject to existing statutory and regulatory requirements, such as the Freedom of Information and Privacy Acts.

   If proprietary information is provided in an application that constitutes proprietary technical data, confidential personnel information, or proprietary commercial or financial information, it will be treated in confidence, to the extent permitted by law, provided this information is clearly marked by the applicant in accordance with paragraph D., above, and provided appropriate page numbers are inserted in the Proprietary Notice legend printed on the first page of the Project Narrative.

   Applications will not automatically be withheld in their entirety unless justified by the applicant. DOE will limit dissemination of such information to official channels to the extent permitted by law. Any other legend may be unacceptable to DOE and may constitute grounds for removing the application from further consideration and without assuming any liability for inadvertent disclosure.

2. Protection of Application Information—DOE's policy is to use data included in applications for evaluation purposes only and to protect, to the extent allowed by law, such information from unauthorized use or disclosure.

   In addition to government personnel, scientists and engineers from outside the government may be used in the application evaluation process. The decision to obtain outside evaluation will take into consideration requirements for the avoidance of organizational conflicts of interest and the competitive relationship, if any, between the applicant and the prospective outside evaluator. The evaluation will be performed under an agreement with the evaluator that the information contained in the application will be used only for evaluation purposes and will not be further disclosed.

3. Rights in Data Developed Under SBIR/STTR Funding Agreements–Rights in technical data, including software developed under the terms of any funding agreement resulting from applications submitted in response to this FOA , shall remain with the grantee, except that the government shall have the limited right to use such data for government purposes and shall not release such SBIR/STTR data outside the government without permission of the recipient for a period of not less than 4 years from delivery of the last deliverable under that agreement (either Phase I, Phase II, or Federally funded SBIR Phase III). Agencies are released from obligation to protect SBIR data upon expiration of the protection period except that any such data that is also protected and referenced under a subsequent SBIR grant must remain protected through the protection period of that subsequent SBIR grant. However, effective at the conclusion of the 4-year period, the government shall have unlimited rights in any data delivered under the grant.

4. Copyrights—The grantee may copyright and publish (consistent with appropriate national security considerations, if any) material developed with DOE support. DOE receives a royalty-free license for the Federal government and requires that each publication contain an appropriate acknowledgment and disclaimer statement.

5. Patents—Grantee may retain the principal worldwide patent rights to any invention developed with Federal support. The government receives a royalty-free license for Federal use, reserves the right to require the

patent holder to license others in certain circumstances, and requires that anyone exclusively licensed to sell must normally manufacture it domestically. Information regarding patent rights in inventions supported by Federal funding can be found in the Code of Federal Regulations, 37 CFR 401.

6. Distribution of Intellectual Property and Commercialization Rights between the Grantee and Subcontractor—When using subcontractors, including research institutions, the grantee is responsible for providing that its subcontractors retain all rights provided for small business and nonprofit entities. Large business subcontractors will need to petition DOE to retain title to inventions pursuant to a pending Class Patent Waiver.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Not applicable.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.

I. AVAILABILITY OF FUNDS

Funds are not presently available for this award. DOE's obligation under this award is contingent upon the availability of appropriated funds from which payment for award purposes can be made. No legal liability on the part of DOE for any payment may arise until funds are made available to the DOE Contracting Officer for this award and until the awardee receives notice of such availability, to be confirmed in writing by the DOE Contracting Officer.

J. AUDIT REQUIREMENTS

A for-profit entity that expends $750,000 or more during the non-Federal entity's fiscal year in DOE awards must have a compliance audit conducted for that year in accordance with the provisions of 2 CFR 910.501. Recipients should budget accordingly.

K. FEDERAL, STATE, AND LOCAL REQUIREMENTS

With respect to the performance of any portion of the work under this award, the recipient agrees to comply with all applicable local, state, and Federal ES&H regulations. The recipient shall apply this provision to all sub awardees at any tier.

L. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE

If question 4.a. on the "Research and Related Other Project Information" document indicates "potential impact on the environment", or if DOE's own review indicates it, DOE may ask the applicant to provide additional information on those impacts in order to prepare an environmental critique/synopsis per 10 CFR 1021.216. Note that this pre-award environmental critique/synopsis process would be separate from the preparation of a NEPA document such as an environmental impact statement (EIS) or an environmental assessment (EA). If DOE determines the latter documentation is necessary, this process would need to be completed, funded by and with the participation of the awardee, prior to them taking any action on the proposed project that could have

adverse environmental effects or that could limit the choice of reasonable alternatives. The inability to satisfy the NEPA requirements after an award would result in cancellation of the award. Note that in most cases, even where potential impact on the environment exists, preparation of such NEPA documents is rarely necessary, but DOE has the expectation that the Applicant will disclose the potential, which would serve to initiate dialog with DOE if necessary. Should the applicant have any uncertainty, they should check “yes.”

APPENDICES/REFERENCE MATERIAL

A. DEFINITIONS

COMMERCIALIZATION

This concerns the process of developing markets and producing and delivering products for sale (whether by the originating party or by others). As used here, commercialization includes both government and private sector markets.

CONSULTANT

A consultant is generally an individual who is not using any institutional or organization facilities and is acting as a direct agent. The individual usually bills by the hour, submitting invoices. Invoices occasionally include additional direct expenses incurred. Consultants are normally subject matter experts and are not directly supervised by the awardee.

EMPLOYEE

A person listed on the budget form (Section A—Key/Senior Person or Section B.—Other Personnel) as an employee of the small business concern is required to either (a) be paid using a W-2 form or (b) possess an Internal Revenue Service determination that the person is an employee using Form SS-8. Persons paid by a 1099 (and not possessing an employee determination using Form SS-8) are to be treated as independent contractors and should be listed on the budget form in Section F.—Other Direct Costs.

HISTORICALLY UNDERUTILIZED BUSINESS ZONE (HUBZONE)

A small business concern meeting the following criteria:

Located in a "historically underutilized business zone" or HUBZone area located in one or more of the following:

- A qualified census tract (as defined in section 42 (d)(5)(c)(i)(I) of the Internal Revenue Code of 1986; or
- A qualified "non-metropolitan county" (as defined in section 143(k)(2)(B) of the International Revenue Code of 1986) with a median household income of less than 80% of the state median household income or with an unemployment rate of not less than 140% of the statewide average, based on U.S. Department of Labor recent data; or
- Lands within the boundaries of federally recognized Indian reservations.
- Owned and controlled by one or more U.S. Citizens.
- At least 35% of its employees must reside in a HUBZone.

To find out if your business is in a HUBZone, use the mapping utility provided by the U.S. SBA at its HUBZone Contracting Website at https://eweb1.sba.gov/hubzone/internet/general/findout.cfm.

INNOVATION

Something new or improved that has marketable potential, including (1) development of new technologies, (2) refinement of existing technologies, or (3) new applications for existing technologies.

INTELLECTUAL PROPERTY

The separate and distinct types of intangible property that are referred to collectively as "intellectual property," including but not limited to: patents, trademarks, copyrights, trade secrets, SBIR/STTR technical data, ideas, designs, know-how, business, technical and research methods, and other types of intangible business assets, and including all types of intangible assets either proposed or generated by a small business as a result of its participation in the SBIR or STTR program.

JOINT VENTURE

A joint venture is an association between two or more firms to participate jointly in a single business enterprise. There must be a community of interests, a sharing of profits and losses, and, for the purposes of this FOA, the new entity must qualify as a small business. If a joint venture is selected for award, a DOE Contract Specialist will request a signed agreement from the parties involved. The agreement must state which company will negotiate the grant and serve as the main point of contact.

NEPA

National Environmental Policy Act of 1969. The Long Title describes it as follows: "An Act to establish a national policy for the environment, to provide for the establishment of a Council on Environmental Quality, and for other purposes." NEPA requires Federal agencies to assess and consider potential impacts from Federal actions in their decision-making.

OSHA

Occupational Safety and Health Act of 1970. The Long Title describes it as follows: "An Act to assure safe and healthful working conditions for working men and women; by authorizing enforcement of the standards developed under that Act; by assisting and encouraging the States in their efforts to assure safe and healthful working conditions; by providing for research, information, education, and training in the field of occupational safety and health; and for other purposes."

RESEARCH OR RESEARCH AND DEVELOPMENT (R&D)

Research or R&D is any scientific or engineering activity which is (1) a systematic, intensive study directed toward greater knowledge or understanding of the subject; (2) a systematic study directed specifically toward applying new knowledge to meet a recognized need; and/or (3) a systematic application of knowledge toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

RESEARCH INSTITUTION

A research institution is a U.S. research organization that is:

- A non-profit research institution as defined in Section 4. Definitions, (5) of the Stevenson-Wydler Technology Innovation Act of 1980 (i.e., an organization owned and operated exclusively for scientific or educational purposes, no part of the net earnings of which insures to the benefit of any private shareholders or individual), or
- A non-profit college or university, or
- A non-profit medical or surgical hospital, or
- A contractor-operated Federally-funded research and development center (FFRDC), as identified by the National Science Foundation in accordance with the government-wide Federal Acquisition Regulation issued

in accordance with section 35(c) (1) of the Office of Federal Procurement Policy Act (or any successor legislation thereto).

- DOE FFRDCs include Ames Laboratory, Argonne National Laboratory, Brookhaven National Laboratory, Fermi National Accelerator Laboratory, Idaho National Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, National Renewable Energy Laboratory, Oak Ridge Institute for Science and Education, Oak Ridge National Laboratory, Pacific Northwest National Laboratory, Princeton Plasma Physics Laboratory, Sandia National Laboratories, Savannah River Technology Center, Stanford Linear Accelerator Center, and the Thomas Jefferson National Accelerator Facility.

A government-owned, government-operated facility, such as the National Energy Technology Laboratory (NETL), is not eligible to act as either a partner or subcontractor in DOE SBIR/STTR projects.

SOCIALLY AND ECONOMICALLY DISADVANTAGED SMALL BUSINESS

A socially and economically disadvantaged small business is one:

- That is at least 51% owned by (i) an Indian tribe or a native Hawaiian organization, or (ii) one or more socially and economically disadvantaged individuals; and,
- Whose management and daily business operations are controlled by one or more socially and economically disadvantaged individuals. A socially and economically disadvantaged individual is defined as a member of any of the following groups: African Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, other groups designated from time to time by the SBA to be socially disadvantaged, or any other individual found to be socially and economically disadvantaged by SBA pursuant to section 8(a) of the Small Business Act, 15 U.S.C. 637(a).

SUBCONTRACT

A subcontract is any agreement, other than one involving an employer-employee relationship, entered into by the primary recipient of a Federal government grant, calling for supplies or services required solely for the performance of the original grant award. Subcontracted work is generally conducted at another institution or company, and usually includes a budget for salaries, and both direct costs and indirect costs. The awardee's responsibilities under the award and its own requirements and terms/conditions are normally passed down to the subcontractor via written agreements.

WOMAN-OWNED SMALL BUSINESS

A woman-owned small business is a small business that is at least 51% owned by a woman or women who also control and operate it. "Control" in this context means exercising the power to make policy decisions. "Operate" in this context means being actively involved in the day-to-day management.

B. WORKING WITH NATIONAL LABS, UNIVERSITIES, RESEARCH INSTITUTIONS, AND OTHER SUBCONTRACTORS

DOE USER FACILITIES

The DOE operates a number of major scientific user facilities to serve researchers from universities, national laboratories, and industry. These facilities enable the acquisition of new knowledge that often cannot be obtained by any other means. Thousands of researchers collaborate with these facilities and analyze their respective data from the experiments to publish new scientific findings in peer-reviewed journals. These facilities may be found at the following web addresses: http://science.energy.gov/bes/suf/user-facilities/ and

http://science.energy.gov/ber/facilities/.

Potential applicants to the SBIR or STTR programs should consider whether the use of any of these facilities would contribute to the scientific efforts proposed in either Phase I or II. For approved experiments (access to these facilities is through a peer-reviewed system), operating time is available without charge to those scientists whose intent is to publish their results in the open literature. If the investigator wishes to perform proprietary research, the user must pay the full-cost recovery rate for facility usage (in which case, the cost could be charged to the SBIR/STTR project); in return, the facility will treat all technical data generated as proprietary, and the user may take title to any inventions resulting from the research. Information on other laboratory facilities which may be available on a case-by-case basis may be obtained through the Federal Laboratory Consortium Locator or directly from the DOE laboratory involved.

IDENTIFYING INSTITUTIONS

Experts at institutions such as DOE contractor-operated national laboratories, universities, colleges, or other research institutions, may be consulted during the preparation of the grant application. Any of these institutions may also serve as a subcontractor to SBIR/STTR Phase I or Phase II projects, providing technical expertise, facilities, or equipment. In such cases, the applicant must have the necessary expertise to direct the project.

For STTR, the applicant must conduct cooperative R&D with a research institution (see definition list). An alliance between the applicant and a research institution must be formed before submitting the grant application. Grants will be awarded to the small business, which will receive all funding for the project and disperse the appropriate funds to the research institution.

A list of DOE National Laboratories is available at https://science.energy.gov/sbir/applicant-resources/national-labs-profiles-and-contacts/ . Also, inquiries may be made at a local library to locate supporting expertise or facilities from an appropriate university or other research institution to assist with the proposed project. For help in contacting personnel at other Federal agency laboratories, go to www.federallabs.org, or contact the FLC Management Support Office by phone at (856) 667-7727 or by email at flcmso@utrs.com.

C. SCIENTIFIC AND TECHNICAL INFORMATION RESOURCES

Applicants may want to obtain scientific and technical information related to their proposed effort as background or for other purposes. Sources of this information are listed in the references for each technical topic and below.

NATIONAL TECHNICAL INFORMATION SERVICE

Reports resulting from Federal research and those received from exchange agreements with foreign countries and international agencies are available to the public in both paper copy and microfiche through the National Technical Information Service (NTIS). They may be ordered electronically from www.ntis.gov or by phone at 1-800-553-6847.

DOE OFFICE OF SCIENTIFIC AND TECHNICAL INFORMATION (OSTI)

OSTI is responsible for fulfilling the requirements of the Energy Policy Act of 2005 to maintain "… publicly available collections of scientific and technical information resulting from research, development, demonstration, and commercial application activities supported by the Department." OSTI collects, preserves, and disseminates research results via Web-based information systems developed on behalf of DOE.

SBIR and STTR applicants may obtain information from the following OSTI sources, available via the web at www.osti.gov or at the specific web addresses below. Information Bridge (www.osti.gov/bridge), over 125,000 searchable full-text documents reporting results of DOE-funded research. Energy Citations Database (www.osti.gov/energycitations), over 2 million searchable citations covering disciplines of interest to DOE from 1948 to the present, with links to full-text when available.

DOE R&D Project Summaries (http://www.osti.gov/home/doe-rampd-project-summaries), a searchable database of descriptions of approximately 22,000 ongoing or recently completed DOE research projects.

E-print Network (www.osti.gov/eprints), which offers single-query access to a network of scientific and technical information and communication, searching more than 900,000 manuscripts, scholarly papers, and other scientific documents residing on approximately 35,300 websites and databases worldwide, containing over 5.5 million e-prints in basic and applied sciences.

Science Conferences (www.osti.gov/scienceconferences), a portal providing a unified search of 26 websites for science and technology conference proceedings and conference papers of interest to DOE.

DOE R&D Accomplishments (www.osti.gov/accomplishments), a central forum for information about the outcomes of past DOE R&D.

D. OTHER RESOURCES

Literature and database searches for abstracts, publications, patents, lists of Federal research in progress, and names of potential consultants in the specific research area can be obtained at good technical libraries (especially those of universities), and from some state organizations.

Science.gov (www.science.gov), a Web portal providing single-query search of more than 50 million pages of science information and research results from DOE and 11 other Federal science agencies.

Technical Assistance for Application Preparation and Project Conduct—applicants may wish to contact their local National Institute of Standards and Technology (NIST) Hollings Manufacturing Extension Partnership (MEP) for manufacturing and other business-related support services. The MEP works with small and mid-sized companies to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from business development assistance to innovation strategies to process improvements and the identification of commercialization opportunities. MEP is a nationwide network of locally managed extension centers with over 1,400 technical experts—located in every state. To contact an MEP center, call 301-975-5020, email mfg@nist.gov, or visit MEP's website at www.nist.gov/mep.