



U.S. DEPARTMENT OF **ENERGY**

FINANCIAL ASSISTANCE FUNDING OPPORTUNITY ANNOUNCEMENT

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

FY 2017 Phase II Release 2

**Funding Opportunity Number: DE-FOA-0001646
CFDA Number: 81.049**

Issue Date: February 13, 2017

Letters of Intent Due Date*: March 15, 2017 by 5:00 pm ET

Application Due Date: April 04, 2017 by 11:59 pm ET

***Required only for Sequential Phase IIA and IIB applicants**

URGENT REMINDERS

REGULATIONS

This FOA and any awards made under it are controlled by 2 CFR 200, the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, as modified by 2 CFR 910 and the Department of Energy Financial Assistance Rules.

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.

ACKNOWLEDGMENT OF FEDERAL SUPPORT

The Office of Science published guidance about how its support should be acknowledged at <http://science.energy.gov/funding-opportunities/acknowledgements/>.

PROPRIETARY NOTICE UPDATE

The procedure for identifying Proprietary Data contained in your application has recently changed. Please follow the instructions provided in PART IV.C. and PART VIII.D. of this FOA regarding the marking of the data considered proprietary.

AVOIDING ERRORS

The following advice is compiled from actual experiences of applicants for Office of Science financial assistance awards.

- Please ensure that the research narrative is comprised of one and only one PDF file, including all appendices, when it is attached to the SF-424 (R&R) form.
- When using the DOE Office of Science Portfolio Analysis and Management System (PAMS) website at <https://pamspublic.science.energy.gov>, please avoid using the back-arrow button in your web browser to navigate.
- Please ensure that the application contains no personally identifiable information (PII).
- Please ensure that the budget is calculated using the applicable negotiated indirect cost and fringe benefit rates.

RECOMMENDATION

You are encouraged to register in all systems as soon as possible. You are also encouraged to submit letters of intent and applications well before the deadline.

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PART I - FUNDING OPPORTUNITY DESCRIPTION

A. STATUTORY AUTHORITY

Public Law 95-91, U.S. Department of Energy Organization Act
Public Law 114-328, National Defense Authorization Act for Fiscal Year 2017

B. APPLICABLE REGULATIONS

Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal awards, codified at 2 CFR 200, as modified by Department of Energy (DOE) Financial Assistance Rules, codified at 2 CFR 910.

C. SUMMARY

The DOE invites eligible Phase I and Phase II grantees to apply for Phase II grants (both initial and sequential) under this Funding Opportunity Announcement (FOA). Topic descriptions for this FOA can be found on the DOE SBIR/STTR web site at <http://science.energy.gov/sbir/funding-opportunities/>.

INITIAL PHASE II GRANTS

The purpose of an Initial Phase II grant is to perform the research and development (R&D) required to meet the DOE objectives stated in the topic and subtopic of the Phase I FOA. In addition, it is intended that the small business grantee would be in a position to pursue commercial applications of the R&D at the end of Phase II. In many cases, Phase II results in a prototype, product, or a working process that can be demonstrated to a potential investor or customer (either in the private sector or in the Federal government, including the DOE).

This FOA is supplemental to the FY 2016 SBIR/STTR Phase I Release 2 FOA (DE-FOA-0001417); therefore, general information already provided in the Phase I FOA also applies to this Phase II process.

If a conflict arises between the Phase I FOA and this Phase II FOA, the Phase II FOA will govern.

SEQUENTIAL PHASE II GRANTS:

There are two types of DOE Sequential Phase II awards:

1. Phase IIA: A Phase II grantee may request additional financial support for new R&D tasks and activities that are aligned with the original scope of work for the Phase II grant. The purpose of the Phase IIA grant is to allow the grantee to complete the R&D associated with initial prototype, product, or process development. The review criteria (see PART V.A.) for Phase IIA applications will be the same as for Initial Phase II grants submitted to this FOA.

Only grantees from the FY 2015 SBIR/STTR Phase II FOAs (DE-FOA-0001193 and DE-FOA-0001258) and pre-selected topics detailed in PART III.A. of this FOA may apply for sequential Phase IIA awards.

In addition, Phase IIA applications will only be accepted from Phase II grantees that have an active Phase II grant at time of application. Applicants will not be able to resubmit at a later date, if a Phase IIA application is declined for award.

2. Phase IIB: A Phase II grantee may request additional financial support for new R&D tasks and activities that extend beyond the scope of the original Phase II grant.

The purpose of the Phase IIB grant is to assist the grantee in transitioning the innovation towards commercialization. The review criteria for Phase IIB awards (see PART V.A.) will be different from both Initial Phase II and Phase IIA applications submitted to this FOA. The review of Phase IIB applications will place greater emphasis on impact and applicants are expected to demonstrate a well-planned path to commercialization as evidenced in commercialization activities conducted in parallel with or after Phase IIB R&D.

Only grantees from the FY 2014 and FY 2015 SBIR/STTR Phase II FOAs (DE-FOA-0001019, DE-FOA-0001072, DE-FOA-0001193 and DE-FOA-0001258) AND pre-selected topics detailed in PART III.A. may apply for sequential Phase IIB awards.

Only Fast Track grantees from the FY 2014 SBIR/STTR Phase I FOAs (DE-FOA-0000969 and DE-FOA-0001046) AND pre-selected topics detailed in PART III.A. may apply for sequential Phase IIB awards.

A Phase II grantee may submit only one sequential Phase II application per eligible award as noted above to either Phase IIA or Phase IIB in response to this FOA. Phase IIA or Phase IIB awards may extend the Phase II grant for up to two years and the combined Phase II and sequential Phase II should not exceed four years, unless an unforeseen delay is encountered.

PART II - AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding grants under this FOA.

B. ESTIMATED FUNDING

Approximately \$75 million is expected to be available for awards under this FOA contingent on the availability of appropriated funds.

DOE is under no obligation to pay for any costs associated with preparation or submission of applications. DOE reserves the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling (i.e., the maximum amount for an individual award made under this FOA):

INITIAL PHASE II

FY 2016 Phase I Release 2 grantees: See the maximum award listed for each topic in the topics document associated with the FY 2016 Phase I Release 2 FOA (DE-FOA-0001417).

SEQUENTIAL PHASE II

Phase IIA: \$1,000,000

Phase IIB: \$1,000,000

Floor (i.e. the minimum amount for an individual award made under this FOA): \$1.

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making approximately 78 awards under this FOA depending on the size of the awards. Both initial and sequential Phase II awards will compete for funding. The majority of funding is anticipated to be used for initial Phase II awards.

E. ANTICIPATED AWARD SIZE

The anticipated average award will be approximately \$1,000,000.

F. PERIOD OF PERFORMANCE

DOE anticipates making awards that will run for up to 24 months over two budget periods. The first budget period, anticipated to begin July 31, 2017, will cover a period of 12 months. Funding for the second budget period will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, availability of funds, and compliance with the terms and conditions of the award. For sequential Phase II awardees whose initial Phase II project period extends beyond **July 2017**, the first budget period of the Sequential Phase II award will commence upon completion of the initial Phase II project period provided. A sequential Phase II award may not overlap with an initial Phase II award and must start by **September 1, 2017**.

G. TYPE OF APPLICATION

DOE is accepting renewal (Phase II) applications under this FOA. Renewal (Phase II) applications are requests for additional funding for a period subsequent to that provided by a current award or Phase I award as noted under "Summary" within PART I.C. of the FOA. Renewal applications compete with all other applications and must be submitted by an established project due date/deadline. In preparing a renewal application, applicants should assume that reviewers will not have access to previous applications. The application should be developed fully, as though the applicant is applying for the first time. The application must include all the information required for a new project, plus the Project Narrative section should discuss the results from the applicable prior Phase I work (initial Phase II application) or prior Phase I and II work (sequential Phase II application).

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE SBIR AND STTR APPLICANTS

INITIAL PHASE II APPLICANTS:

Only the following two groups are eligible to apply for an Initial Phase II grant under this FOA:

1. Currently active DOE SBIR or STTR Phase I grantees with grants resulting from FOA DE-FOA-0001417; or
2. Currently active SBIR or STTR Phase I grantees that (a) received the Federal Phase I award in FY 2016, (b) have received a written determination from the Director of the SBIR/STTR Programs Office that the topic under which they received funding is the same as the topic in FOA DE-FOA-0001417, and (c) are not submitting a Phase II application based on the award described in (a) to another Federal agency.*

*NOTE: Applicants that received their FY 2016 Phase I award from another Federal agency must request a written determination from the Director of the SBIR/STTR Programs Office that the topic under which they received funding is the same as the topic in FOA DE-FOA-0001417. Send requests to e-mail: sbir-sttr@science.doe.gov. Applicant must: 1) provide Phase I award number, contact information for the Phase I Contracting Officer (or Grant Agreement Officer); 2) Phase I FOA number and topic; and 3) the DOE Phase II topic number. Applicant must complete all close-out activities for the Phase I prior to award of a Phase II from the DOE.

SEQUENTIAL PHASE II APPLICANTS:

Phase IIA

Only grantees from the following FY 2015 SBIR/STTR Phase II FOAs AND from the following pre-selected topics may apply for sequential Phase IIA awards:

Eligible Phase II FOA	Eligible Topic(s)	DOE SBIR/STTR Funding Program
DE-FOA-0001193	22a	Defense Nuclear Nonproliferation
DE-FOA-0001193	23a, 23b	Defense Nuclear Nonproliferation
DE-FOA-0001193	30a	High Energy Physics
DE-FOA-0001193	32a	High Energy Physics
DE-FOA-0001193	33c	High Energy Physics
DE-FOA-0001193	35b	High Energy Physics
DE-FOA-0001258	10c,11d, 12e, 12f, 13c, 14c	Fossil Energy
DE-FOA-0001258	19a, 19b, 19d, 19f	Nuclear Energy
DE-FOA-0001258	21a, 21b	Nuclear Energy

Eligible Phase II grantees must successfully complete their Phase II grants on schedule to be eligible to receive a Phase IIA grant.

Phase IIB

Only grantees from the following two FY 2014 and two FY 2015 SBIR/STTR Phase II FOAs AND pre-selected topics may apply for sequential Phase IIB awards:

Eligible FY 2014 Phase II FOA	Eligible Topic(s)	DOE SBIR/STTR Funding Program
DE-FOA-0001072	01	Electricity Delivery and Energy Reliability
DE-FOA-0001072	02, 05 - 08, 11	Energy Efficiency and Renewable Energy
DE-FOA-0001072	13	Environmental Management
DE-FOA-0001072	14 -17	Fossil Energy
DE-FOA-0001072	19	Nuclear Energy
DE-FOA-0001019	03, 04, 05, 06, 08	Energy Efficiency and Renewable Energy
DE-FOA-0001019	27, 28	Fusion Energy Sciences
DE-FOA-0001019	31 – 35, 37	High Energy Physics

Eligible FY 2015 Phase II FOA	Eligible Topic(s)	DOE SBIR/STTR Funding Program
DE-FOA-0001258	02, 03, 06, 07, 09	Energy Efficiency and Renewable Energy

DE-FOA-0001258	10 - 14	Fossil Energy
DE-FOA-0001258	15 - 17	Fusion Energy Sciences
DE-FOA-0001258	19 - 21	Nuclear Energy
DE-FOA-0001258	1, 22	Electricity Delivery and Energy Reliability
DE-FOA-0001193	22, 23, 26, 27	Defense Nuclear Nonproliferation
DE-FOA-0001193	30 – 33, 35	High Energy Physics

Only Fast Track grantees from the following FY 2014 SBIR/STTR Phase I FOAs AND from the following pre-selected topics may apply for sequential Phase IIB awards:

Eligible FY 2014 Phase I FOA	Eligible Topic(s)	DOE SBIR/STTR Funding Program
DE-FOA-0001046	21	Nuclear Energy
DE-FOA-0000969	22	Defense Nuclear Nonproliferation

Eligible Phase II or Fast Track grantees must successfully complete their Phase II grants (including no fund extensions) to be eligible to receive a Phase IIB grant.

SMALL BUSINESS CONCERNS

Applicants must meet the SBIR/STTR program eligibility requirements in 13 CFR PART 121, Small Business Size Regulations. The eligibility requirements are in place to ensure that the funds go only to small, independent U.S. businesses. The regulations 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. A Small Business Concern (SBC) is one that, at the time of award for both Phase I and Phase II SBIR/STTR awards, meets the requirements of all three restrictions.

TYPE OF BUSINESS: 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. Only U.S. 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 both of the following criteria:

- Organized for profit, with a place of business located in the United States (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; and
- 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, each entity to the joint venture must meet the requirements set forth in paragraphs 1-3 under OWNERSHIP STRUCTURE.

OWNERSHIP STRUCTURE

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. A majority (more than 50%) of your firm's 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 SBCs (each of which is more than 50% directly owned and controlled by individuals who are citizens or permanent resident aliens of the U.S.). If you include other for-profit SBCs as part of the eligible ownership majority of your firm, you must verify that each such concern is more than 50% owned and controlled by individuals who are U.S. citizens or permanent resident aliens of the U.S.;
3. A combination of (1) and (2) above. Additional ownership structures are identified in 13 CFR § 121.702; or
4. SBCs 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. SBCs must meet this criterion at both time of submission and time of award.

BUSINESS SIZE

An SBC must meet the following size requirements:

- 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.
- Further information may be obtained by contacting the Small Business Administration Size District Office at <http://www.sba.gov/size>.

B. OTHER ELIGIBILITY REQUIREMENTS

The research or R&D must be performed in the United States. "United States" means the 50 states, the territories and possessions of the United States, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia. Non-U.S. citizens are eligible to perform work on SBIR/STTR projects provided he/she is legally empowered to work in the U.S. at the time that an award is made.

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.

RESTRICTIONS ON SUBMITTING APPLICATIONS

Applications for Phase II funding may be submitted to either the SBIR or STTR program regardless of which program (SBIR or STTR) your Phase I award was granted. However, the respective minimum level of effort

requirements, i.e., small business participation, must be met. Please refer to “Restrictions on the Level of SBC participation” below.

MANDATORY APPLICATION DOCUMENTS

Applicants must include all mandatory documents described in PART IV.C. Failure to include mandatory documents is grounds for administrative declination of the application.

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:

NATIONAL SECURITY: CLASSIFIABLE RESULTS ORIGINATING UNDER AN AWARD (DECEMBER 2014)

- 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.

EXPORT CONTROL

The SBIR/STTR programs support research with commercial potential. As such, research in fields subject to export control regulation is not within the scope of this FOA. Applications marked as containing material subject to export control regulation may be declined without merit review.

RESTRICTIONS ON THE LEVEL OF SBC PARTICIPATION

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 requirements for one of the programs, it will only be considered for the one program for which it does meet the eligibility requirements.

- SBIR - At least 50 percent of the research or analytical effort must be performed by the SBC. Accordingly, at least 50 percent of the total funding requested on the budget form, excluding any purchased or leased equipment, materials, and supplies (whether purchased by the applicant or a subcontractor), must be allocated to the SBC.
- STTR - Awards will be made to SBCs for cooperative R&D to be conducted jointly with a research institution. At least 40 percent of the work must be performed by the SBC, and at least 30 percent of the work must be performed by a single research institution. Accordingly, at least 40 percent of the total funding requested on the budget form, excluding any purchased or leased equipment, materials, and supplies (whether purchased by the applicant, the research institution, or a subcontractor), must be allocated to the SBC, and at least 30 percent must be allocated to a single research institution.

A Level-of-Effort worksheet in both PDF and Microsoft Excel versions is available to assist in calculating the analytical effort for the project at <http://science.energy.gov/sbir/applicant-and-awardee-resources/grant-application/>.

RESTRICTIONS ON THE PRINCIPAL INVESTIGATOR (PI)

General PI Requirements and Restrictions

The PI is the individual designated by the applicant to direct the project. The PI must be knowledgeable in all technical aspects of the application and be capable of leading the research effort. Because DOE's evaluation of the application is critically dependent on the qualifications of the PI, changes in the PI that are made after award selection are strongly discouraged. Requests for PI changes will be closely scrutinized and may cause delays in grant execution.

In addition, the PI must devote a minimum of 520 hours to the project or at least five hours per week if the project is less than 24 months in duration. If the project is less than 24 months in duration, applicants must state in the Performance Schedule of the Project Narrative the duration of the project in weeks, in order to make clear that this requirement is fully met. If the application is selected for funding, the PI may be required to sign a statement certifying adherence to all PI requirements.

In order to ensure appropriate technical guidance for the project, only one PI will be accepted per project. Processing of applications that include co-PIs may be delayed while the error is corrected by the applicant. Non-

U.S. citizens are eligible to perform work on SBIR/STTR projects provided he/she is legally empowered to work in the U.S. at the time that an award is made.

Additional PI Restrictions when submitting to SBIR Only

To be awarded an SBIR grant, the applicant must meet the general requirements and the PI's primary employment must be with the SBC 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 SBC 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 Only

To be awarded an STTR grant, the applicant must meet the general requirements and the PI's primary employment may be with the SBC or the research institution. However, the SBC must still provide technical control and oversight of the project. If the PI is employed by the research institution, his/her primary employment must be with the research institution in order to qualify under STTR. If the PI is employed by the SBC, his/her primary employment must be with the SBC. The PI must be listed and funds must be requested on the budget submitted from the entity that is the primary employer of the PI.

RESTRICTIONS ON THE MANAGEMENT OF SBIR/STTR PROJECTS

All SBIR and STTR funding agreements are made with the SBC regardless of the proportion of the work or funding of each of the performers (SBC, research institution, subcontractor, etc.) under the grant. As the primary grantee, the SBC has the overall responsibility of the project, including financial management and the direction and control of the performance. For STTR projects, even if the PI is from the research institution, the SBC must provide overall direction and supervision of the project while the PI will manage the research portion of the project.

It is recommended that all agreements between the SBC and any subcontractor (including the research institution collaborating in a STTR project) reflect the controlling management position of the SBC during the performance of the Phase I and/or Phase II. 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.

RESTRICTIONS ON SUBCONTRACTING AND CONSULTANTS

Consultants may not be employees of either the SBC or any subcontractor. SBC personnel cannot be reimbursed with DOE funding as a consultant, or as an employee of a subcontractor under the project.

C. 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 a FFRDC must be consistent with the contractor's authority under 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

The applicant, if successful, 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 contractor.

D. COST SHARING

Cost sharing is not required. However, any commercial contributions will be considered as part of the evaluation. See PART IV.C., Phase II Funding Commitment (Commercial Contribution) [OPTIONAL] and Phase III Follow-On Funding Commitment [OPTIONAL] and the review criteria in PART V.A., Criteria.

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 <http://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.

Applications submitted through www.FedConnect.net will not be accepted. Do not submit your application through FedConnect.

B. LETTER OF INTENT AND PRE-APPLICATION

LETTER OF INTENT

Initial Phase II: Not Required

Sequential Phase IIA or Phase IIB: Required

Sequential Phase II Letter of Intent (LOI)

An LOI is required and must be submitted by the SBC and received by DOE no later than March 15, 2017, 5:00 pm ET. Only those applicants that submit an LOI which is received by DOE by the due date are eligible to submit an application under this FOA.

The LOI must be submitted electronically through the PAMS website <https://pamspublic.science.energy.gov/>. It is important that the LOI be a single file with extension .pdf,

.docx, or .doc. Anyone submitting an LOI must register for an account in PAMS before it will be possible to submit the LOI. Anyone submitting an LOI is encouraged to establish a PAMS account as soon as possible to avoid submission delays.

The 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)
- DOE Award Number DE-SC000XXXX
- Type of Sequential Phase II submission: Phase IIA or Phase IIB
- Sequential Phase II Project Title (same as your initial Phase II project title)
- Phase I topic and subtopic number (same as your Phase I and initial Phase II)
- 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.

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 Letter of Intent:

- 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.
- 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 one and 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.

Note: Each Phase IIA and/or Phase IIB application you submit must have the same title, topic, and subtopic as your LOI.

All submission and inquiries about this FOA must reference the FOA number on the front cover of this FOA.

Though DOE will acknowledge LOI receipt, it will not provide feedback on content or quality of LOI submission. LOIs are 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.

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

PRE-APPLICATION

Not Required

C. CONTENT AND FORMAT OF APPLICATION

This section describes all the required and optional information that must be included in the application package. All of the following must be included in the application package or at least addressed. All of the information provided in the response will be evaluated using the review criteria described in PART V – APPLICATION REVIEW INFORMATION.

You must complete the mandatory forms and any applicable optional forms (e.g. SF-LLL-Disclosure of Lobbying Activities) 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 FOA.

Files that are attached to the forms must be in 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 use PDF portfolios or binders.

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, period and limit the file name to 50 or fewer characters. Attachments that do not follow this rule may cause the entire application to be rejected or cause issues during processing.

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 - 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, as applicable	PDF	Field 12
Other - SBA Company Registration	PDF	Field 12
Other - Phase I Final Technical Report (For initial Phase II applicants)	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) Form	PDF	
SBIR/STTR Information Form	PDF	
Phase II Commercialization Plan	PDF	Field 7
Commercialization History, if applicable	PDF	Field 8

SF 424 (R&R): [MANDATORY]

Complete this form first to populate data in other forms. Identify the Award Number assigned to the project in the Federal Identifier field (number 4). 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. The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms and Information For Applicants and Recipients web page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>, under Certifications and Assurances.

Use 07/31/2017 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 project narrative and on each page that contains proprietary information in accordance with instructions provided in PART VIII.D. and PART VIII.F. Failure to comply may result in DOE’s inability to treat such information as proprietary and may delay the award process.

Note Concerning Question 4a.

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 minimus 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)].

Note: 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 the DOE may make it available to the public. The Project Summary must not exceed 500 words of text. Save this information in a file named “Summary.pdf,” and click on “Add Attachment” to attach it.

The purpose of the Project Summary is to communicate the overall sense of the project, not every step of the work plan or every accomplishment in Phase I. 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 SBC, any subcontractors or institutions, or any trade/product name) in the body of the summary.

The header must include:

- Company name
- Project Title
- Principal Investigator
- Topic number/subtopic letter

The body must include:

- Statement of the problem or situation that is being addressed. 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 service 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 combined Phase I and Phase II projects. How is this problem being addressed? What is the overall approach of the combined Phase I/Phase II project? (Typically one to two sentences).
- What was done in Phase I (and Phase II, if applying for Sequential A or B)? (Typically two to three sentences).
- What is planned for the Phase II project? (Typically two to three 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 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 with a maximum of 50 words). The DOE notifies members of Congress of awards; 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.

Suggested Format: To ensure that the research need is clearly identified, please state the problem to be addressed in the first sentence. In the second sentence, state what is being done to address the problem.

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

The Project Narrative describing your technology is considered the main portion of the application and must not exceed 20 pages or 10,000 words of text, 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 text in tables and graphs. Also, sections such as the budget, budget justification, key personnel, commercialization plans and final technical reports should not be included in the Project Narrative but attached in the appropriate fields for those forms.

Phase II applications must propose R&D required to meet the DOE objectives stated in the technical topic of the Phase I 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](#). The work proposed in Phase II, assuming that it proceeds successfully, should be suitable in nature for subsequent progression into Phase III. To attach a Project Narrative, click "Add Attachment."

The Project Narrative must include ALL of the following using this outline:

- Cover page - Provide company-specific and project information including company name and address, principal investigator, project title, topic number, subtopic letter, and grant award number.
- Provide a Proprietary Data Legend - if applicable in accordance with the following [PART VIII.D](#).
- Table of Contents
- Significance, Background Information, and Technical Approach
 - 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, if the project is successful and is carried over into Phase 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.
- Degree to which Technical Feasibility has been Demonstrated - For Initial Phase II applications, discuss the purpose of your Phase I research, the research carried out, the research findings or results, and your estimate of technical feasibility. In particular, address the degree to which the Phase I objectives have been met. The Initial Phase II application should include all relevant information concerning the research carried out in Phase I. Technical reviewers are not always the same as used in Phase I, therefore, may not be familiar with the Phase I application.
- For Technology Transfer Opportunities, you must include an update on the status of the option agreement with the Research Institution.
- For Sequential Phase II applications, please address the following in your technical narrative:
Phase IIA: Please discuss the R&D that was originally proposed for Phase II and the R&D that was or will be completed by the end of Phase II. The scope of work proposed for Phase IIA is limited to completing that originally proposed for Phase II.
Phase IIB: Please discuss how the originally proposed work for Phase II has or will be successfully completed during the Phase II project period. Also discuss how the proposed Phase IIB R&D builds upon the successful Phase II work to enhance the opportunity for commercialization. If you have completed your Phase II Final Technical Report, you may cite it here and attach it to Field 12 of the RESEARCH AND RELATED Other Project Information form.
- The Phase II Project
 - Technical Objectives - State the specific technical objectives of the Phase II research and development. If submitting a sequential Phase IIA or IIB application, please clearly indicate the need for additional funding beyond that provided in the initial Phase II award.
 - Work Plan - This section should be a substantial part of the technical application. Provide an explicit, detailed description of the Phase II research approach and work to be performed. Indicate what will be done, by whom (SBC, subcontractors, or consultants) where it will be done, and how the work will be carried out, both programmatically and in regards to protection of human health and the environment.
 - Link the work plan to the 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 in Phase III. 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 SBC is to be the primary grantee with overall responsibility for its performance.
 - Performance Schedule - Phase II projects are typically for 24 months. Please note that the performance period should cover two budget periods of up to 12 months each. Funding for the 2nd budget period will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, and availability of funds. Please state in this section if the project will be completed in less than 24 months and identify the proposed project length in weeks. Briefly describe the important milestones and the estimated amount of time for completing each task described in the work plan.

- Facilities/Equipment - Describe available equipment and physical facilities necessary to carry out the Phase II effort. Equipment is defined in 2 CFR 200.33 as “tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-Federal entity for financial statement purposes, or \$5,000.” Items of equipment to be leased or purchased must be described and justified in this section. 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. SBCs may get credit for obtaining this equipment as an in-kind Phase II commercial contribution as described in section 6 below.
- 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 Phase II awards.
- Consultants and Subcontractors (including Research Institutions for STTR)
 - Research Institution - If the application contains substantial collaboration with a research institution (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 research institution, and the total dollar amount of the subcontract; (2) describe in detail the work to be done by this institution in the Work Plan section; (3) provide a budget and budget justification; (4) and provide 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 application.

The research institution will be considered a subcontractor to the SBC applicant. The research institution must provide a letter of commitment on official letterhead from an authorized representative of the institution which commits the institution to participate in the project as described in the application. The letter should be attached as an “Other Attachment” in field 12, on the Research & Related Other Project Information form. If selected for award, participation of the research institution will be verified by the contracting office.

Consultants and Other Subcontractors - Involvement of consultants or subcontractors in the planning and research stages of the project is permitted provided the work is performed in the United States. 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" from an authorized representative of the consultants and/or subcontractors. The letters 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 they have agreed to serve in the manner and to the extent described in the Work Plan section of the application. Each letter 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 award, the contracting office will verify the participation of any subcontractors and/or consultants and will require budget and budget justifications for subcontractors and verification of the rates for consultants.

Note: None of the employees or owners of the applicant SBC may be consultants. None of the employees or owners of the applicant SBC may be employees of a Subcontractor, except when the

Subcontractor is a Research Institution. Consultants must not be employees of any proposed Subcontractor. SBC personnel cannot be reimbursed with DOE funding as a consultant or employee of a subcontractor under the project. 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.

- Phase II Funding Commitment (Commercial Contribution) [OPTIONAL] - While not a requirement to obtain Phase II funding, applicants are encouraged to submit a Phase II commitment from the private sector or non-SBIR/STTR funding sources.
- Phase III Follow-On Funding Commitment [OPTIONAL] - Applicants are encouraged to submit a Phase III follow-on funding commitment. The commitment must indicate when the funds will be made available, and contain specific technical objectives which, if achieved in Phase II, will make the commitment exercisable by the applicant. If the commitment is firm regardless of technical objectives achieved, it should state so. The commitment may include: (1) third party financing; (2) self-financing (in which case the proposing SBC 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 contributions. The Phase III commitment must be submitted with the Phase II 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 the form). [DO NOT USE THIS FIELD] - Include this information, if any, in the project narrative. Do not attach a file in this field.
- Facilities & Other Resources (Field 10 on the form) [DO NOT USE THIS FIELD] - Include this information, if any, in the project narrative. Do not attach a file in this field.
- Equipment (Field 11 on the form) [DO NOT USE THIS FIELD] - Include this information, if any, in the project narrative. Do not attach a file in this field.

OTHER ATTACHMENTS (FIELD 12 ON THE 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" document, provide the information in a single file named "projinfo.pdf." Click on "Add Attachments" in Field 12 to attach file.

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."

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. Do not attach these to the SF 424. Please attach to Field 12 of the “Other Project Information” form. See Note above for guidance.

- Phase I Final Technical Report [mandatory for Initial Phase II applications]. If you requested and were granted a no-cost extension to your Phase I project period, you must attach in Field 12 an interim Final Technical Report [mandatory] on your progress to date.
- Signed Letter of Phase II Funding Commitment, if applicable
- Phase III Follow-On Funding Commitment, if applicable
- Signed Letter of Commitment from any subcontractors (including Research Institutions)
- Letters of Commitment from consultants, subcontractors, or other third parties
- Level-of-Effort Worksheet (discussed in PART III) located at <http://science.energy.gov/sbir/applicant-and-awardee-resources/grant-application/>. If the Microsoft Excel version is used, it must be converted to PDF before attaching it to the application.
- A copy of the PDF file received from the Small Business Administration (when a Control ID was provided), after the completion of the SBA Company Registration at <http://sbir.gov/registration>.

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 PI is the key individual designated by the applicant to direct the project. Only one PI is acceptable per project and all work must be performed in the United States. See “Restrictions on the Principal Investigator” in [PART III.B](#), OTHER ELIGIBILITY REQUIREMENTS.

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 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 list, in chronological order, 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, year of publication, and website address if available electronically.

Intellectual Property

Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.

Synergistic Activities

List no more than five professional and scholarly activities related to the effort proposed.

Personally Identifiable Information

The biosketch must not include birthdates, social security numbers, or any other forms of Personally Identifiable Information.

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]

Applicants may request funding of up to \$1,000,000 (or up to \$1,500,000 if designated in the Phase I topic header) for up to 24 months over two budget periods. The first budget period should cover a period of 12 months. Funding for the second budget period will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, availability of funds and compliance with the terms and conditions of the award. The amount budgeted for the first 12 month budget period should not exceed 50% of the total budget. If an applicant requires more than 50% of the total budget during the first 12 month budget period, a thorough explanation is required in the budget justification, and is subject to DOE approval.

Complete the Research and Related Budget form in accordance with the instructions on the form and the following instructions. You must complete a separate budget for each year of support requested. The form will generate a cumulative budget for the total project period. You must complete all the mandatory information on the form before the NEXT PERIOD button is activated. 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 as allowable under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this FOA (See [PART IV.G.](#)). Note, however, that foreign travel and participant/trainee costs are typically considered unallowable costs unless approved by the DOE contracting officer.

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

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

1. If you wish to receive commercialization assistance from the DOE vendor, you do not need to include this in your budget. If you are awarded a Phase II grant, you will receive notification from DOE on what services are available and how to obtain these services at no cost to your SBC.

2. If you wish to utilize your own commercialization assistance provider, you are required to include this as a subcontract or consultant in your budget and to provide a detailed budget justification. You may include up to \$5,000 each year (cumulative two-year cost not to exceed \$10,000). Please note that the commercialization assistance does not count toward the maximum grant size listed in [PART II. C.](#); e.g., seeking commercialization assistance from your provider could result in a maximum grant in the amount of \$1,010,000. Commercialization assistance costs will not be used to determine compliance with [PART III. B. RESTRICTIONS ON THE LEVEL OF SBC PARTICIPATION](#). 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, the remaining funds cannot be re-budgeted to other project costs. Re-budgeting of these funds is not allowable. Commercialization assistance costs in excess of \$5,000 during any budget year are unallowable and will not be reimbursed.

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

Provide supporting information for all proposed costs. Personnel justification must include the total hours and hourly rates for all personnel. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year. Provide any other information you wish to submit to justify your budget request including, but not limited to, any recent audits, clearly defined indirect cost rate bases, and voluntary reductions of indirect rates. If your organization has an Indirect Cost Rate Agreement in effect with your Cognizant Federal Agency [Defense Contract Audit Agency (DCAA), Department of Health and Human Services (DHHS), etc.] supporting the indirect rate(s) proposed and dated within one year of your anticipated grant start date, then please provide this information with your application. Although there is no absolute cap on indirect costs, applications will be evaluated for overall economy and value to DOE.

If you are selected for a grant, additional budget explanation will most likely be required.

All proposed purchases of equipment will be carefully reviewed relative to need and appropriateness for the research or R&D proposed.

Travel funds must be justified and related to the needs of the project, as in travel to DOE Headquarters to meet with DOE program managers. 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 concurrence has been obtained by the DOE Program Manager and unless written approval has been obtained from the DOE contracting officer.

With justification, Phase II grant funds may be used to pay up to \$15,000, as a direct cost only, in patent filing fees and related filing expenses for the first U.S. patent for inventions developed under the Phase I or Phase II projects. In the event some or the entire amount listed is not expended on a patent filing, the remaining funds may be budgeted to other allowable project costs.

Tuition expenses are allowable only if requested from a subcontractor that is a university and the amount requested for tuition is reasonable and comparable to what a student would be paid for performing research during the grant performance period.

Grants may include a profit or fee for the SBC. Fees are subject to negotiation and shall not exceed 7 percent. Note: Profit/fee is not "Program Income" and should not be included in field 15.d. of the SF 424.

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 across all budget documents including subawards.

Complete the Level-of-Effort worksheet located at <http://science.energy.gov/sbir/applicant-and-awardee-resources/grant-application/>. If the Microsoft Excel version is used, it must be converted to PDF before it is attached to the application in Field 12 – Research & Related Other Project Information.

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

You must provide a separate SF 424 (R&R) budget and budget justification for each sub-awardee that is expected to perform work.

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.

SBIR/STTR INFORMATION FORM [MANDATORY]

Complete all the required forms in accordance with the pop-up instructions on the form. Applications that lack the required documents will be administratively declined.

Commercialization Plan (Question 7) (Required)

Your Commercialization Plan narrative cannot exceed 15 pages. This page limit does not include return on investment and net present value worksheets, pro forma worksheet, and Letters of Support, which must be appended to the commercialization plan narrative. Your Commercialization Plan must be uploaded to field 7 as a single document. This information will be evaluated and considered part of the score for the "Impact" criterion discussed in PART V.

DOE recognizes that each innovation requires a varied strategy to generate returns on invested capital and that no two businesses are exactly alike. Therefore, DOE supports a broad array of commercialization strategies. Each strategy requires varied emphasis on the parts of the plan depending on your innovation and the market landscape. For instance, the strategy and mechanisms for leveraging and protecting intellectual property (IP) vary according to industry and innovation.

The Commercialization Plan is your roadmap for the future and should convey how you plan to generate profits from your innovation. It should represent a compelling vision that describes a unique business opportunity that could be addressed with continued support from Phase II funding. The depth and quality of the analysis within your Commercialization Plan is a critical element of the DOE SBIR/STTR application review.

Please Note: All assumptions and estimates provided should be clearly stated as such and evidence of validation should be provided in a footnote. Where you provide numerical data (e.g. market size, price, etc.) or data about customer needs, market forces, barriers to entry and the like, you should indicate the source of the data using footnotes. Market research reports, articles by experts in trade publications or professional journals, interviews, focus groups, surveys, are among commonly used sources of data.

The following four sections must be addressed in your Commercialization Plan using a narrative format. Do not submit your Commercialization Plan in a question and answer format:

1. Market Opportunity

- a) Describe succinctly what product or service you are planning to deliver based on your innovation.
 - Identify your target customer(s) providing generally known examples.
 - Describe the critical needs that your product or service will fulfill for your customer(s) (i.e. these can be current or emerging).
 - How does the target customer(s) currently meet the need that you are addressing and what do they pay to meet the need?
 - What is/are your customer(s) willing to pay for your product or service? How have you validated this assumption?
 - What features of your product or service will allow you to provide a compelling value proposition? How have you validated the significance of these features? State the value proposition for your product or service.
- b) Address Market Opportunity
 - What is the current size of the broad market you plan to enter? How large is your “niche” market opportunity, in terms of either numbers of customers or revenues? (If you use number of customers, estimate revenues based on the anticipated selling price of your product or service.)
 - Is the target market domestic, international, or both?
 - What are the growth trends for the market and the key market drivers that will affect whether customers will buy your product or service?
 - What barriers to entry exist in this market which will inhibit sales of your product or service?
- c) Describe the channels you would employ to reach the targeted customer.
- d) What business model will you adopt to generate revenue from your innovation?
 - Will you make and sell? License? Form a strategic alliance with a company already in the industry? Use a different model?
 - Explain why this model makes sense for the market opportunity described.
- e) If there are potential societal, educational, or scientific benefits beyond commercial considerations that will generate goodwill for your company or the product or service, they should be included here and explained in sufficient detail to convey the significance of the effort.

2. Company/Team

- a) Provide a short description of the origins of the company.
- b) What type of corporate structure is in place?
- c) What is the current capitalization and is it sufficient for implementing your Commercialization Plan?

- d) What is the revenue history for the past three years? What is your anticipated revenue history through Phase II? Provide a table with percentages or sums of operating capital or revenue: product sales, consulting/services, license revenues, research and development grants/contracts, and others.
 - e) What is the current employee count?
 - f) Give a brief description of the experience and credentials of the personnel responsible for taking the innovation to market and clarify how the background and experience of the team enhance the credibility of the Commercialization Plan.
 - g) What specific experience does the team lack and how will this be addressed during the Phase II effort and beyond? From what additional resources do you have commitments to address these limitations e.g., Board of Directors, technical advisors, or retained legal counsel? Please provide details on names, affiliations, and expertise of these resources.
3. Competition/Intellectual Property
- a) Describe currently existing products or services that are found in the patent literature (and if relevant, copyright and trademark literature) or that is emerging from research or R&D which may be substitutes for your product or service.
 - How does your product or service match up to these substitutes in terms of the needs customers are seeking to meet?
 - Who is developing, making, and selling those products or services and what do you anticipate the competitive landscape to look like when you get to market?
 - b) Describe IP rights you have secured for your technology to date and if any procedures are underway to expand or enhance the protection provided by those rights. Please describe your actions to protect these rights.
 - c) Describe which IP is closest and which is most threatening to your “freedom to operate” and how you are different enough to be able to secure your freedom to operate.
 - d) What other IP will you need to secure rights to make, use, or sell in order to address the market opportunity described above?
4. Finance and Revenue Model
- a) Describe an appropriate staged finance plan given the market opportunity. Outline the level of funding required for each stage along the path to commercialization.
 - What are your costs to complete research and development, product, and production development/design/engineering, and to produce the product or service?
 - What are the costs required to implement your commercialization strategy?
 - How will you access the appropriate funds?
 - b) Provide a table with anticipated costs identifying the anticipated source of each detailing revenues or other operating capital you can devote to these. If there is a shortfall, explain how you will raise or access the appropriate funds. If no additional cash is needed explain why you are confident that is the case.
 - c) Provide specific contacts, leads, previous relationships, and agreements already in place. Are any other commitments in place which will affect your ability to raise Phase III follow-on funding?
 - d) Provide an estimate of the DOE Return on Investment (ROI) or Net Present Value (NPV) for this project. A template for estimating ROI is provided at the DOE SBIR/STTR Programs Office web site at <http://science.energy.gov/sbir/applicant-and-awardee-resources/grant-application/>. This estimate should incorporate the profit before taxes (positive cash flow) for the first 10 years of commercialization and treat the DOE SBIR or STTR funding as an investment (negative cash flow). Describe the revenue streams (licensing, product sales or other) associated with your Commercialization Plan. When do you anticipate “first revenues” from each stream? When do you expect to reach “break even”? To help project NPV, please refer to following worksheets on the DOE

SBIR/STTR Programs Office web site at <http://science.energy.gov/sbir/applicant-and-awardee-resources/>.

- e) Provide annual pro formas for the next five years (two years of the Phase II effort + three years post Phase II). Income Statements are required. Cash Flow and Balance Sheets may be included if they are considered critical for your strategy. If not included, Cash Flow and Balance Sheets should be made available, upon request from DOE.

Please Note: You must indicate the assumptions and estimates being made in this part of your application and clearly state the source of the data you have used to validate these assumptions or as a basis for making assumptions or estimates. You must also indicate the source for any numerical or other hard data provided, such as market size, price, market drivers, and barriers to entry. Evaluate the competitive advantages of this technology vs. alternate technologies that can meet similar market needs.

SF-LLL DISCLOSURE OF LOBBYING ACTIVITIES

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 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 Standard Form - LLL, "Disclosure Form to Report Lobbying."

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. (We have explicit guidelines for marking proprietary information and they should be referenced here.)

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

IF SELECTED FOR AWARD, DOE RESERVES THE RIGHT TO REQUEST ADDITIONAL OR CLARIFYING INFORMATION INCLUDING, BUT NOT LIMITED TO:

- Indirect cost information;
- Other budget information;
- Representations of Limited Rights Data & Restricted Software, if applicable;
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable;
- Consultant documentation/verification of rates.

CERTIFICATIONS AND ASSURANCE

By submitting an application in response to this FOA the applicant certifies that:

- It is not a corporation that has been convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months;
- 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 definitions apply:

- 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 corporation. It includes both for-profit and non-profit organizations.

If selected for award, applicants will be required to sign and submit one or more of the certifications available at <http://science.energy.gov/sbir/applicant-and-awardee-resources>. Any forms required will be provided by the DOE Contract/Grants Management Specialist during award negotiation.

E. SUBMISSION DATES AND TIMES

LETTER OF INTENT DUE DATE

Initial Phase II: Not sought.

Sequential Phase II: Letters of Intent must be received by March 15, 2017, by 5:00 pm ET.

APPLICATION DUE DATE

Applications must be received by April 04, 2017, by 11:59 pm ET. Modifications will be accepted if received by the deadline time on the due date. You are encouraged to transmit your application well before the deadline.

LATE SUBMISSIONS

Delays in submitting letters of intent 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 VII of this FOA (sbir-sttr@science.doe.gov) no later than 24 hours after the submission deadline to request a late submission.

You are responsible for beginning the submission process in sufficient time to accommodate reasonably foreseeable incidents, contingencies, and disruptions.

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.

Withdrawal of Applications

Applications submitted under this FOA may be withdrawn from consideration by using the Office of Science's PAMS website at <https://pamspublic.science.energy.gov>. Applications may be withdrawn at any time between when the applicant submits the application and when DOE makes the application available to merit reviewers. Such withdrawals take effect immediately and cannot be reversed.

Note that there may be a delay between the application's submission in Grants.gov and when it is available to be withdrawn in PAMS. The Office of Science will usually consider the last submission, according to its Grants.gov timestamp, to be the intended version. Please consult with your program manager to resolve any confusion about which version of an application should be considered.

F. INTERGOVERNMENTAL REVIEW

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

G. FUNDING RESTRICTIONS

Funds will be allocated over the two budget periods. Funding for the 2nd budget period will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, availability of funds and compliance with the terms and conditions of the award.

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). The Cost Principles for Commercial Organizations may be found at: www.ecfr.gov

PRE-AWARD COSTS

Recipients may charge to a grant resulting from this announcement pre-award costs that were incurred within the 90 calendar-day period immediately preceding the effective date of the grant, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 2 CFR 200 as modified by 2 CFR 910. Recipients must obtain the prior approval of the DOE contracting officer for any pre-award costs that are for periods greater than this 90 calendar-day 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 or if the costs are found to be unallowable, unreasonable, or not allocable to this project.

H. OTHER SUBMISSION AND REGISTRATION INFORMATION

Phase II applicants are encouraged to ensure that their registrations remain valid.

SYSTEMS TO REGISTER IN

Applicants must be registered in SAM (<http://sam.gov>); Grants.gov (www.grants.gov); PAMS (<https://pamspublic.science.energy.gov>); FedConnect (www.fedconnect.net); and the Federal Accountability and Transparency Act Subaward Reporting System (<https://www.fsr.gov>). Refer to the Phase I FOA (DE-FOA-0001417) for additional guidance related to registering in these systems.

WHERE TO SUBMIT AN APPLICATION

Applications must be submitted through Grants.gov to be considered for award. You cannot submit an application through Grants.gov unless you are registered in all cited systems. DOE recommends that you register as soon as possible.

Applicants must download the application package, application forms and instructions, from Grants.gov at <http://www.grants.gov/>

(Additional instructions are provided in Section 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.

APPLICATION RECEIPT NOTICES

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).

DOE OFFICE OF SCIENCE PORTFOLIO ANALYSIS AND MANAGEMENT SYSTEM

After you submit your application through Grants.gov, the application will automatically transfer into the Portfolio Analysis and Management System (PAMS) for processing by the DOE Office of Science. 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 at the bottom of p. 15.

VIEWING SUBMITTED APPLICATIONS

Each Grants.gov application submitted to the DOE Office of Science 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.

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 to register in PAMS that are outlined at the bottom of p. 15 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, <http://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 FOA should reference DE-FOA-0001645.

PART V - APPLICATION REVIEW INFORMATION

A. CRITERIA

INITIAL ADMINISTRATIVE REVIEW CRITERIA

The SBIR/STTR office will perform an initial review to ensure that the applications meet minimum requirements and include all required forms and documentation as sought in the FOA. If it is determined that the minimum requirements for any application have not been met, the application will be administratively declined and will not undergo merit review.

MERIT REVIEW CRITERIA: INITIAL PHASE II APPLICATIONS:

The Phase II application must contain enough information on progress accomplished under Phase I to enable an evaluation of the project's promise.

DOE plans to make selections for Phase II awards from those applications judged to have the highest overall merit within their technical program area. The review criteria and their weighting are provided below.

Strength of the scientific/technical approach (1/3)

As evidenced by: (1) the strength and innovativeness of the overall idea and approach for the combined Phase I/Phase II project, (2) the significance of the scientific or technical challenge, and (3) the thoroughness of the presentation.

Ability to competently carry out the project (1/3)

As evidenced by: (1) the qualifications of the PI, other key staff, consultants and subcontractors, if any, and the level of adequacy of equipment and facilities; (2) the soundness and level of adequacy of the work plan to meet the problem or opportunity; (3) with regard to the Phase I objectives, the degree to which Phase I has proven feasibility of the concepts; and (4) the degree to which the DOE investment in the project would be justified by the level of proposed research effort.

Impact (1/3)

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. Phase II applications will be evaluated for commercial potential using the Commercialization Plan criteria (see PART IV.C. for details): (1) Market Opportunity, (2) Company/Team, (3) Competition/Intellectual Property, and (4) Finance and Revenue Model. Each section should be developed with careful analysis of your company's position within the industry and the market opportunity that is enabled by the proposed innovation. Applications that receive poor commercialization potential reviews may not be eligible for funding. The key points required for each section are further described below in PART V.B. "REVIEW AND SELECTION PROCESS."

MERIT REVIEW CRITERIA: SEQUENTIAL PHASE IIA APPLICATIONS

The Phase IIA application must contain enough information on progress accomplished under Phase II to enable an evaluation of the project's promise.

DOE plans to make selections for Phase IIA awards from those applications judged to have the highest overall merit within their technical program area. The review criteria and their weighting are provided below.

Strength of the scientific/technical approach (1/3)

As evidenced by: (1) the strength and innovativeness of the overall idea and approach for the combined Phase I/Phase II/Phase IIA project, (2) the significance of the scientific or technical challenge, and (3) the thoroughness of the presentation.

Ability to competently carry out the project (1/3)

As evidenced by: (1) the qualifications of the PI, other key staff, consultants and subcontractors, if any, and the level of adequacy of equipment and facilities; (2) the soundness and level of adequacy of the work plan to meet the problem or opportunity; (3) with regard to the Phase II objectives, the degree to which Phase II has proven the soundness of the technical approach; and (4) the degree to which the DOE investment in the project would be justified by the level of proposed research effort.

Impact (1/3)

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, and (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. Phase IIA applications will be evaluated for commercial potential using the Commercialization Plan criteria (see PART IV.C. for details): (1) Market Opportunity, (2) Company/Team, (3) Competition/Intellectual Property, and (4) Finance and Revenue Model. Each section should be developed with careful analysis of your company's position within the industry and the market opportunity that is enabled by the proposed innovation. Applications that receive poor commercialization potential reviews will not be eligible for funding. The key points required for each section are further described below in PART V.B. "REVIEW AND SELECTION PROCESS."

MERIT REVIEW CRITERIA: SEQUENTIAL PHASE IIB APPLICATIONS

The Phase IIB application must contain enough information on progress accomplished under Phase II, to enable an evaluation of the project's promise.

DOE plans to make selections for Phase II awards from those applications judged to have the highest overall merit within their technical program area. The review criteria and their weightings are provided below.

Impact (1/2)

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, and (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. Sequential Phase II B applications will place significant emphasis on the existence of Phase II funding commitments and Phase III follow-on funding commitments. Applicants who lack these commitments are not encouraged to apply. Phase II applications will be evaluated for commercial potential using the Commercialization Plan (see PART IV.C. for details): (1) Market Opportunity, (2) Company/Team, (3) Competition/Intellectual Property, and (4) Finance and Revenue Model. Each section should be developed with careful analysis of your company's position within the industry and the market opportunity that is enabled by the proposed innovation. Applications that receive poor commercialization potential reviews will not be eligible for funding. The key points required for each section are further described below in PART V.B. "REVIEW AND SELECTION PROCESS."

Strength of the scientific/technical approach (1/4)

As evidenced by: (1) the strength and innovativeness of the overall idea and approach for the combined Phase I/Phase II/Phase IIB project, (2) the significance of the scientific or technical challenge, and (3) the thoroughness of the presentation.

Ability to competently carry out the project (1/4)

As evidenced by: (1) the qualifications of the PI, other key staff, consultants and subcontractors, if any, and the level of adequacy of equipment and facilities; (2) the soundness and level of adequacy of the work plan to meet the problem or opportunity; (3) with regard to the Phase II objectives, the degree to which Phase I has proven soundness of the technical approach; and (4) the degree to which the DOE investment in the project would be justified by the level of proposed research effort.

PROGRAM POLICY FACTORS

The Selection Official may consider program balance of funds distribution, 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**MERIT REVIEW**

Phase II 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 significant 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. In addition, Phase IIB applications will be considered candidates for funding only if they receive the highest rating for the impact criterion.

SELECTION

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. Selections are made from this ranked list until the program's SBIR/STTR Phase II budget is exhausted. The Selection Official may also consider program balance of funds distribution, needs of the technical programs, and the applicant's performance under prior DOE SBIR/STTR awards including timely submittal of all reports as Program Policy Factors.

DISCUSSIONS AND AWARD

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (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; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude grant to the applicant.

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:

- Technical merit of the application,

- Reports and findings from audits performed under 2 CFR 200 or 2 CFR 910,
- Systems maintained under 2 CFR 180, and
- 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.

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.

D. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

The DOE anticipates sending notice of selection on June 19, 2017 and the anticipated grant start date is July 31, 2017.

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 award, the terms of the award shall control.

NOTICE OF SELECTION

The SBIR/STTR Programs Office will notify all applicants of the outcomes of award selections via email.

NOTICE OF AWARD

An Assistance Agreement issued by the contracting officer is the authorizing award document. The initial funding Assistance Agreement normally includes, either as an attachment or by reference: 1. Special Terms and Conditions; 2. General Terms and Conditions for DOE SBIR and STTR grants; 3. Application as approved by DOE; 4. National Policy Assurances to be incorporated as award terms; 5. Budget; 6. Federal Assistance Reporting Checklist and Instructions; and 7. Regulations at 2 CFR 200 as amended by 2 CFR 910.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

ADMINISTRATIVE REQUIREMENTS

The Uniform Administrative Requirements, Cost Principles, and Audit Requirements for these awards are contained in 2 CFR 200 as amended by 2 CFR 910 (DOE Financial Assistance Regulation). (See: www.ecfr.gov).

DUNS AND SAM REQUIREMENTS

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR 25 (See: www.ecfr.gov). Prime grantees must keep their data at the System for Award Management (SAM) current at <https://www.sam.gov>. 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 grantees 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 are contained in 2 CFR 170. (See: www.ecfr.gov). Prime grantees must register with the new FSRS database and report the required data on their first tier sub-awardees. Prime grantees must report the executive compensation for their own executives as part of their registration profile in the SAM.

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 which 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. The recipient shall apply this provision to all subawardees at any tier.

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.

NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE (NEPA)

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 a NEPA document such as an environmental assessment or environmental impact statement. If DOE determines such documentation 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. (See the definitions provided for "NEPA" and "Potential Impact on the Environment" provided in PART IX.) 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."

TERMS AND CONDITIONS AND NATIONAL POLICY REQUIREMENTS.

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>.

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 USC 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.

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 contractors 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 and Instructions DOE F 4600.2, attached to the SBIR or STTR award agreement. The current version of the checklist will be available at: <http://science.energy.gov/sbir/applicant-and-awardee-resources/awardee-documents/>. Please review the checklist carefully as requirements have recently changed.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

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.

Questions relating to the PAMS registration process, system requirements, or any technological issues should be directed to the DOE Office of Science PAMS Support Center at 855-818-1846 or 301-903-9610 or sc.pams-helpdesk@science.doe.gov. The PAMS Help Desk hours of operation are 8:30 AM to 5:00 PM Eastern Time, Monday through Friday. The PAMS help desk is closed on Federal holidays and weekends.

Questions regarding the specific program areas and technical requirements may be directed to the technical contacts listed for each program within the FOA or below.

B. AGENCY CONTACTS

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 may 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 <http://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 FOA and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

A DOE financial assistance award is valid only if it is in writing and is signed, either in writing or electronically, by a DOE Contracting Officer. Recipients are free to accept or reject the award. A request to draw down DOE funds constitutes the Recipient's acceptance of the terms and conditions of this Award.

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 evaluation. Examples of documents that may contain proprietary information include the commercialization plan and the project narrative.

To protect such data, your application must be marked in the following manner utilizing the three-step process outlined below:

1. The Cover Page of the Project Narrative 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 in place of “brackets [].”

To see examples of proper IP markings, please visit the SBIR/STTR Programs web site at <http://science.energy.gov/sbir/applicant-and-awardee-resources/> .

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, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government 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. Personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM PROPERTY AND COMMERCIALIZATION RIGHTS AGREEMENTS

When using subcontractors, including research institutions, the applicant 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.

A model agreement, found on the SBIR/STTR Programs Office web site at <http://science.energy.gov/sbir/applicant-and-awardee-resources/> and may be used or revised through negotiation between the applicant 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 SBC 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 SBC with respect to both intellectual property rights and any rights to carry out follow-on research.

INTELLECTUAL PROPERTY INCLUDING INNOVATIONS, INVENTIONS, AND PATENTS

Proprietary Information

Information contained in unsuccessful applications will remain the property of the applicant. The Government will retain for at least 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. The Government will limit dissemination of such information to official channels to the extent permitted by law. Any other legend may be unacceptable to the Government and may constitute grounds for removing the application from further consideration and without assuming any liability for inadvertent disclosure.

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.

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 proprietary data outside the Government without permission of the recipient for a period of not less than four years from delivery of the last deliverable under that agreement (either Phase I, Phase II, Phase IIA, Phase IIB, or Federally funded Phase III). Agencies are released from obligation to protect data upon expiration of the protection period except that any such data that is also protected and referenced under a subsequent award must remain protected through the protection period of that subsequent award. However, effective at the conclusion of the 4-year period, the Government shall retain a royalty-free license for Government use of any technical data delivered under an SBIR/STTR award, whether patented or not.

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.

Patents

SBCs 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 37 CFR PART 401.

Distribution of Intellectual Property and Commercialization Rights between the SBC and Subcontractor

When using subcontractors, including research institutions, the SBC is responsible for providing that its subcontractors retain all rights provided for the SBC. Large business subcontractors will need to petition DOE to retain title to inventions.

NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Not applicable.

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.

G. AVAILABILITY OF FUNDS

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

H. AUDIT REQUIREMENTS

Under 2 CFR 910.501, a for-profit recipient that expends \$750,000 or more in a year (including any pre-award costs) under DOE Financial Assistance awards must have an audit made for that year by an independent auditor (regardless of when the expenditures are presented to DOE for reimbursement). In determining whether the \$750,000 threshold is met, recipients should assess the amount of DOE funds expended under the award and shall not include any cost-sharing amounts.

PART IX - 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 organizational 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 SBC 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 SBC 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 percent of the state median household income or with an unemployment rate of not less than 140 percent 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 percent 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 <http://www.sba.gov/hubzone/>.

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 SBC 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.

NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act of 1969 (NEPA). 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.

POTENTIAL IMPACT ON THE ENVIRONMENT

DOE understands “potential impact on the environment” to apply if the work described in the application could potentially have any of the impacts identified below:

- (1) Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health;
- (2) Require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators);

- (3) Disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment;
- (4) Have the potential to cause significant impacts on environmentally sensitive resources. Environmentally sensitive resources include, but are not limited to:
 - (i) Property (such as sites, buildings, structures, and objects) of historic, archeological, or architectural significance designated by a Federal, state, or local government, Federally recognized Indian tribe, or Native Hawaiian organization, or property determined to be eligible for listing on the National Register of Historic Places;
 - (ii) Federally-listed threatened or endangered species or their habitat (including critical habitat) or Federally-proposed or candidate species or their habitat (Endangered Species Act); state-listed or state-proposed endangered or threatened species or their habitat; Federally-protected marine mammals and Essential Fish Habitat (Marine Mammal Protection Act; Magnuson-Stevens Fishery Conservation and Management Act); and otherwise Federally-protected species (such as the Bald and Golden Eagle Protection Act or the Migratory Bird Treaty Act);
 - (iii) Floodplains and wetlands, as defined in 10 CFR 1022.4, "Compliance with Floodplain and Wetland Environmental Review Requirements: Definitions," or its successor;
 - (iv) Areas having a special designation such as Federally- and state-designated wilderness areas, national parks, national monuments, national natural landmarks, wild and scenic rivers, state and Federal wildlife refuges, scenic areas (such as National Scenic and Historic Trails or National Scenic Areas), and marine sanctuaries;
 - (v) Prime or unique farmland, or other farmland of statewide or local importance, as defined at 7 CFR 658.2(a), "Farmland Protection Policy Act: Definitions," or its successor;
 - (vi) Special sources of water (such as sole source aquifers, wellhead protection areas, and other water sources that are vital in a region); and
 - (vii) Tundra, coral reefs, or rain forests; or
- (5) Involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species.

In addition, DOE understands "potential impact on the environment," to apply if the work described in the application could potentially have any of the impacts identified below:

Any other high consequence impacts to the environment which have any possibility for 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 which are 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) or:

- a) Have extraordinary circumstances (i.e., scientific or related public controversy) related to the significance of environmental effects [see 10 CFR 1021.410(b)(2)];
- b) Are connected to other actions with potentially significant impacts [see 10 CFR 1021.410 (b)(3)]; or
- c) Are related to other nearby actions with the potential for cumulatively significant impacts [see 10 CFR 1021.410 (b)(3)].

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 inures 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, 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 percent 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 Small Business Administration (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 recipient of a Federal Government grant, calling for supplies or services required solely for the performance of the original grant award.

WOMAN-OWNED SMALL BUSINESS

A woman-owned small business is a small business that is at least 51 percent 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 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 SBC must have the necessary expertise to direct the project.

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

A list of DOE National Laboratories and relevant small business contacts is available at <http://science.energy.gov/sbir/applicant-and-awardee-resources/national-labs-profiles-and-contacts/>. For help in contacting personnel at other Federal agency laboratories, go to www.federalabs.org, or contact the FLC Management Support Office by, Phone: (856) 667-7727 or email: flcmso@utrs.com.

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. They may be ordered electronically from <http://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://energy.gov/search/site/DOE%20R%26D%20Project%20Summaries>), 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 web sites 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.

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 - SBCs may wish to contact their local National Institute of Standards and Technology 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 1-800-MEP-4-MFG (1-800-637-4634) or visit MEP's website at www.nist.gov/mep.