EERE SBIR FY 2016 Phase I R2 Q&A Table of Contents

General Questions

Question 1: What are the requirements for Letters of Intent (LOIs) including due date?

Answer: Letters of Intent, are mandatory if you want to submit an application. Everything you need to know about submitting an LOI is either in the FOA or in the List of Technical Topics that was published November 2. Both are available on DOE's SBIR website at: http://science.energy.gov/sbir/funding-opportunities/ Your LOI should demonstrate that your are capable and knowledgeable on the subject so that we can determine if your full Phase I proposal is responsive to the technical topic, merits your time to prepare, and DOE's time to review. We recruit reviewers based on the number of responsive LOIs. Unlike applications, LOIs are due at 5:00 p.m. EST on the December 21, 2015 due date.

Question 2: How many Phase 1 awards are intended to be awarded?

Answer: The FOA states the estimated amount of awards.

Question 3: We have already submitted an STTR on our concept as part of the Release 1. I see that the Release 2 has a topic that is suited to our project. Would you advise us on whether we should submit a Letter of Intent even though a very similar proposal is under consideration?

Answer: Up to the applicant. Submitting a letter of intent for this round will not affect applications from a previous round.

Question 4: I would like to set up a phone call to further discuss/ask several questions pertaining to a topic.

Answer: These webinars and Q&As are the primary vehicle for applicant communication, in order to maximize fairness to all applicants.

Question 5: We'd like to collaborate with a DOE Lab. Do you have contacts that are working with technology in this area?

Answer: Unless it is not an explicit TTO opportunity, it would provide unfair advantage to provide particular lab contacts for these topics. All applicants are encouraged to visit national lab websites if searching for lab collaborators.

General Questions

Question 6: Is it possible to include foreign collaborators in proposals?
Answer: Non-U.S. citizens are eligible to perform work on SBIR/STTR projects provided they are legally empowered to work in the U.S. at the time that an award is made and throughout the duration of the project.

Question 7: Would municipal utilities be able to qualify as subcontractors to an otherwise qualified small business primary applicant?
Answer: Municipal utilities are clearly not eligible as a primary applicant. It has to be a small business, as defined in the Code of Federal Regulations (CFR), and referenced in the eligibility section of the solicitation. Non-profits are only eligible as a "research institution" subcontractor in an STTR application.

Question 8: Where can I get information on Phase 0?
Answer: For information on Phase 0 please visit the following website:
http://www.dawnbreaker.com/doephase0/

Question 9: During Phase 1, does DOE prefer to see participation with National Laboratories (i.e. ORNL, NREL, PNNL, etc.) or private labs (i.e.: Alden, etc.) as part of the work proposed? If yes, is there any preference as to the working relationship (i.e. subcontractor vs partner or other relationship)?
Answer: There are two types of programs – SBIR and STTR. The major difference between these programs is that STTR must involve substantial cooperative research collaboration between the small business and a single Research Institution whereas the collaboration with research institutions or other organizations for SBIR is optional.

There are no requirements and/or preferences regarding lab participation or their working relationship with the applicant other than what is described in the FOA.

9. ADVANCED MANUFACTURING

The Advanced Manufacturing Office (AMO) (www1.eere.energy.gov/manufacturing/) partners with industry, small business, universities, and other stakeholders to identify and invest in emerging technologies with the potential to create high-quality domestic manufacturing jobs and enhance the global competitiveness of the United States.

a. Technology for the US Petroleum Refining Industry.

Contact: brian.valentine@ee.doe.gov.

b. Natural Gas and Manufacturing.

Contact: brian.valentine@ee.doe.gov.

c. Energy-Water Nexus.

Contact: david.forrest@ee.doe.gov.

d. Atomically Precise Structures and Devices for Catalysis.

Contact: david.forrest@ee.doe.gov.

10. BIOENERGY

The Bioenergy Technologies Office is focused on forming cost-share partnerships with key stakeholders to develop, demonstrate, and deploy technologies for advanced biofuels production from lignocellulosic and algal biomass.

a. Design and Fabrication of Solids Handling for Biomass Conversion Systems.

Contact: mark.elless@ee.doe.gov.

Question 17: The 2 design reports are similar in cost (80 v. 75 $/dry ton, PNNL v NREL, resp.), but very different in ash content (0.9% v. 5.93%), moisture content (10% v. 25%), and particle size (2-6mm v. pellets of un-specified size). The FOA description is clear that continuous solids handling is the primary topic, but discussion of pre-processing steps to meet reactor throat requirements (comminution, blending, ash removal, metals removal, dirt washing, pelletization) is missing. Are we to understand that the topic is exclusively for materials movement?

Answer: The topic is for materials handling of feedstocks that would meet the in-feed specifications for either biochemical or thermochemical conversion.

Question 18: Would preconversion(heating) be beneficial for this Topic?

Answer: If this is to help the solids handling into the conversion throat, that would be acceptable.

10. BIOENERGY

Question 19: Why are you holding the topic to 10% less for a robust solids handling system that can feed any material? Such a system would garner a premium price or if allowed to use such a system or method would require licensing fees, etc.

Answer: In order to achieve a minimum fuel selling price that can be cost competitive with petroleum derived fuels, many costs have to be absorbed into the per-gallon production price. The intent of this topic area is to show how a robust solids handling system can improve not just the operability of fuels production facilities but also to ensure that the resulting products are cost competitive.

Question 20: An immediate commercial application is to feed ag residues to a farm-scale biochar reactor, but it would seem the SBIR interest is only for circa 2000 MT/day central plant biomass conversion systems. Can you please either confirm this or expand on whether smaller applications with the ability to scale up would be responsive?

Answer: Smaller applications that can scale to 2000 MT/day would be responsive.

b. Liquefaction of Wet Organic Waste Streams using Sub- and Supercritical Fluids.

Contact: daniel.fishman@ee.doe.gov.

Question 21: If the intent is to have an entire, coupled system at Phase II that does intermediary/precursor production along with upgrading to drop-in fuels, is it acceptable at Phase I to develop an entirely new type of reactor for precursor production? The reactor developed in Phase I would be the focus of the larger system in Phase II.

Answer: The proposal would need to make a convincing case for the coherence of the overall approach. If the reactor was an intrinsic element of the overall value proposition, this could work, but this one would need more details, such as would be provided in an LOI, for full evaluation.

10. BIOENERGY

Question 16: How does DOE define HTL?
Answer: The topic uses HTL as an example, rather than a set of restrictions. The overall target is sub- and supercritical liquid-based processes for conversion of eligible feedstocks into biofuels and bioproducts. While water and CO2 are probably the primary solvent candidates, proposals that utilize e.g. methanol or ethanol may merit consideration. In the latter cases, energy balances and techno-economic considerations would be particularly critical.

Question 17: Is distillers corn oil considered a wet organic waste stream?
Answer: Be very careful about utilizing anything that could be utilized as a food product precursor to produce biofuels or bioproducts. Congress has been very clear that the DOE is not to consider edible feedstocks for energy applications. Food wastes are definitely within scope, including those from the production of animal feeds. In contrast, anything that could be turned into something that either a human or an animal could eat will be frowned upon – specific Congressional mandates supersede whatever language was included in the SBIR topic.

10. BIOENERGY

c. Co-utilization of CO2 and CH4 to Produce Biofuel and Bioproduct Precursors.

Contact: daniel.fishman@ee.doe.gov

Question 22: Would a low-temperature plasma reformer that can be used for dry reforming of CO2 + CH4 to syngas + C2's be responsive? The C2's produced by plasma dry reforming are primarily C2H2 and C2H4 with perhaps a small yield of C2H6 depending on operating conditions.

Answer: The topic expressed interest in C2 and higher compounds with double bonds, which was a specific reference to ethylene. To the degree that a proposal focused on ethylene as a primary product, it would likely be considered responsive. C2H6 is not of material interest under this topic. Acetylene is responsive as the topic was written, but it is clearly a lower priority than ethylene.

Question 23: Our concept is take biogas produced by anaerobic digesters and use an advanced membrane to separate the CO2 from the CH4. The CO2 is used to accelerate the growth of algae in bioreactors that enable high CO2 capture and high growth rates.

Answer: Proposals that utilize algae are specifically called out as non-responsive. Applicants are encouraged to explore solicitations from the DOE's algae program.

10. BIOENERGY

Question 24: According to the instruction, there is an option about dry (utilizing CO2) reforming of methane. This process converts CO2 and CH4 to syngas, which is conflicting with another instruction “Proposals that produce syngas, ethanol, or methanol as a final product will be considered non-responsive, although all of those substances are acceptable as process intermediates”. Do we have to include both dry reforming and FT to convert CO2 and CH4 to wax and liquid fuel in the proposal? If so, we are not sure if it is too big to achieve for a Phase I program.

Answer: This is a fair point, and the language probably could have been clearer. The questioner is correct that dry reforming and relevant upgrading processes together are a bit much for a Phase I effort. The intent of the language that prohibits syngas as a final product is to ensure that responsive proposals take the next step in conversion to a biofuel or bioproduct. So, an application that proposed dry reforming in phase I and upgrading in Phase II would likely be considered responsive. Even so, that is intentionally a stretch goal, so applications that proposed substantial progress towards a final product in phase II would probably merit consideration.

Question 25: We are developing an exciting new chemical platform to produce fermentable sugar from methane, CO2 or biogas. We are also developing a biological platform to metabolically engineer microorganism to utilize our sugar as a sole carbon source for the production of biofuels. Our platform is a Part known. We are looking for a seed funding to test the proof of concept in some of the key areas of our technology.

Answer: The question here is not clear. In particular, it is difficult to parse "Our platform is a Part known". In general, applications that propose a credible value proposition from both the CO2 and CH4 in biogas will merit consideration.

10. BIOENERGY

Question 22: Would polyhydroxyalkanoate (PHA) be considered a bioproduct precursor as per the language in the solicitation? We use a microbiological process to produce PHA from a combination of methane and carbon dioxide and are highly interested in this solicitation.
Answer: PHA from CO2 and CH4 would definitely be considered responsive to this solicitation.

Question 23: Would a proposal focused on methanol as a carbon source be appropriate for your DOE SBIR Program Area 10c?
Answer: Methanol is allowable only as an intermediate. Responsive proposals will describe a complete pathway from biogas to biofuels and bioproducts. In particular, the energy and heat balances, and the technoeconomic analyses, must include the entire set of conversion processes. Proposals that start from methanol will be judged non-responsive.

11. BUILDINGS

DOE's Building Technologies Office (BTO) advances building energy performance through the development and promotion of efficient, affordable, and high impact technologies, systems, and practices. BTO's long-term goal is to reduce energy use by 50%, compared to a 2010 baseline. To secure these savings, research, development, demonstration, and deployment of next-generation building technologies are needed to advance building systems and components that are cost-competitive in the market.

a. Energy Efficient Solid-State Lighting Luminaires, Products, and Systems.
Contact: james.brodrick@ee.doe.gov. or edp@lincolntechnicalservices.com

Question 30: Is your program is interested in low-cost lost-profile motion sensing devices that can be integrated into SSL systems?

Answer: We can never be completely sure get the full application. It would be important to include details of how your approach fundamentally and innovatively differs from others that are already on the market.

Question 31: Would a SSL lighting system that incorporates daylight harvesting, DC spectral and lighting controls along with solar photovoltaics be responsive? Provided the system meets DOE 200lumen per watt requirement.

Answer: You have provided only technical data but the subtopic requires both price and performance goals. A lighting technology that is of very high efficiency but that cannot compete in price is unacceptable.

11. BUILDINGS

Question 32: Will DOE include labor and material savings when calculating the cost comparisons to meet the SSL R&D price goal?

Answer: There are no formal DOE guidelines to calculate installation costs or first costs of any lighting system, SSL, legacy or otherwise. You should use calculations that include all installation and component costs. If your innovation eliminates wiring and labor, you should include that cost savings in your analysis.

b. Technologies for Sensing and Managing Indoor Air Quality in Buildings. Contact: mohammed.khan@ee.doe.gov.

Question 36: I have a question regarding proposals for "Accurate sensors for indoor air quality" in SBIR topic 11b. I wonder whether the "other pollutants relevant to the indoor air environment" desired to be sensed might include particle suspensions such as smoke or dust?

Answer: We can never be sure until we get the full application, but this appears to be viable.

12. FUEL CELLS

The Office of Energy Efficiency and Renewable Energy Fuel Cell Technologies Office (FCTO) http://www1.eere.energy.gov/hydrogenandfuelcells works in partnership with industry (including small businesses), academia, and DOE's national laboratories to establish fuel cell and hydrogen energy technologies as economically competitive contributors to the U.S. transportation needs.

a. **TECHNOLOGY TRANSFER OPPORTUNITY: Durable, High Activity Electrocatalyst with Low Platinum Content and Low Cost for Polymer Electrolyte Membrane Fuel Cell Applications**.
Contact: nancy.garland@ee.doe.gov.

Question 40: For a TTO topic, does the lab enter into a CRADA with the applicant or does the lab become a sub?
Answer: The Labs will put some type of agreement in place to support the collaboration, typically a CRADA or WFO depending on the nature of the relationship. In addition, BNL would be a subcontractor to the applicant.

12. FUEL CELLS

Question 41: What about actual products that perform better then fuel cells where by the conversion of the Hydrogen is near 95%. Would the office permit this application?
Answer: The topic is only for scale-up of core shell fuel cell electrocatalysts using IP from Brookhaven National Laboratory.

b. Magnetocaloric Materials Development.

Contact: erika.Sutherland@ee.doe.gov

c. TECHNOLOGY TRANSFER OPPORTUNITY: H2 Safety Sensors for H2 Infrastructure Applications.

Contact: charles.james@ee.doe.gov.

A collection of Q&As on this subtopic can be found at:
http://www.lanl.gov/projects/feynman-center/collaboration/collaboration-opportunities/eere-sbir-tech-transfer-opportunity-h2-safety-sensors.php.

Question 42: Please clarify the statement “associated know-how for H2 sensor manufacturing and packaging”, in the DE-FOA-0001417-1 TECH TRANSFER OPPORTUNITY: H2 Safety Sensors for H2 Infrastructure Applications. Is this "associated know-how" transferred through a CRADA? Can you quantify the value?
Answer: Typically, the lab participating in the tech transfer opportunity would usually established a CRADA between the company and the lab. Additionally, a research institution as a sub-contract for an SBIR can be allocated up to 1/3 of the SBIR award to assist the small business. That would be $50K for a Phase1. Los Alamos costs would include our overhead rates. Los Alamos will provide a Statement of Capabilities letter to the SBIR Agency with an outline the tasks Los Alamos can perform within the SBIR Phase 1 for the budget allocated.

13. SOLAR

The DOE SunShot Initiative (www.energy.gov/SunShot) aims to achieve subsidy-free, cost competitive solar power by the end of the decade. **NOTE:** Solar is the only Topic in EERE that allows Fast Track applications thus the question below apply only to Solar.

a. Controls and Systems for the On-Site Consumption of Solar Energy.

Contact: solar.sbir@ee.doe.gov.

Question 50: Would generating hot water or steam onsite using DC from PVC fit within your topic for stored energy?

Answer: If load controls for existing water heaters are included, that would be of interest. This topic is not focused on industrial processes.

Question 51: What about cracking Natural Gas to Hydrogen with Zero Carbon Emissions?

Answer: This would not be of interest.

Question 52: Often, when solar/battery configurations already exist, it makes sense to add a Solid Oxide Fuel Cell system, to reduce the number of batteries and provide true primary power. Would a systems interface connecting the integrated fuel cell/solar/fuel cell/grid qualify, since it is more deployment than R&D?

Answer: This could potentially be of interest. The topic focuses on developing the controls needed for integrating PV with other resources.

b. Shared Solar Energy Development Tools.

Contact: solar.sbir@ee.doe.gov.

14. Vehicles

a. **Electric Drive Vehicle Batteries.**

Contact: brian.cunningham@ee.doe.gov.

b. **SiC MOSFETs for Electric Drive Vehicle Power Electronics.**

Contact: steven.boyd@ee.doe.gov.

c. **Reduction of PGM Loading in Automotive Emission Control Systems.**

Contact: ken.howden@ee.doe.gov.

d. **Variable Compression Ratio or Variable Stroke Internal Combustion Engine With Real-Time Controllability.**

Contact: breton.leo@ee.doe.gov.

e. **Alternative Crank Mechanisms for Internal Combustion Engines Leading to Improved Energy Efficiency.**

Contact: breton.leo@ee.doe.gov.

15. Water

The Water Power Program, part of **the Wind and Water Power Technologies Office**, researches, tests, evaluates, and develops innovative technologies capable of generating renewable, environmentally responsible, and cost-effective electricity from water resources. This includes hydropower, as well as marine and hydrokinetic energy technologies, which capture energy from waves as well as riverine, tidal, and ocean currents.

a. Innovative Very Low-head and Instream Current Water Power Turbine-Generator Technologies.
Contact: rajesh.dham@ee.doe.gov.

Question 70: Can you clarify if the 10-foot limit on head is for gross head, or if it includes any losses such as intake, or exit velocity losses?

Answer: The technology office website has a complete set of performance criteria. Please visit: http://energy.gov/eere/renewables/water

Question 71: Are there any specific ranges for Levelized Cost of Energy, which should be achievable by competitive proposals?

Answer: It should be at the price performance frontier.

Question 72: Is there a target water velocity for instream river technologies?

Answer: No velocity limits are specified in the topic description.

15. Water

Question 73: The solicitation refers to the technologies sought as “turbines”. Are you open to innovative Converters that are not turbines?
Answer: DOE will consider innovative technologies that may not use a turbine but such technologies must generate power at less than 10 feet head or instream currents (in rivers, streams, canals or natural and man-made waterways).

Question 74: Could you please point us to the definitions of
"Hydropower technologies and in-stream hydrokinetic technologies” which will be considered.
“Ocean current or tidal current technologies” which are not of interest under this subtopic.

Answer: Marine and hydrokinetic technologies (MHK) is defined in Section 632 of the Energy Independence and Security Act of 2007 (reproduced below):
SEC. 632. DEFINITION.
For purposes of this subtitle, the term ‘‘marine and hydrokinetic renewable energy’’ means electrical energy from—
(1) waves, tides, and currents in oceans, estuaries, and tidal areas;
(2) free flowing water in rivers, lakes, and streams;
(3) free flowing water in man-made channels; and
(4) differentials in ocean temperature (ocean thermal energy conversion).
The term ‘‘marine and hydrokinetic renewable energy’’ does not include energy from any source that uses a dam, diversionary structure, or impoundment for electric power purposes.

For topic 15a we are considering MHK technologies that fall in the items (2) and (3) above. We are not considering technologies MHK technologies that fall in the items (1) and (4) above.

In addition we are considering hydropower technologies including those that generate energy from any source that uses a dam, diversionary structure, or impoundment for electric power purposes.

15. Water

Question 75: Are there other resources that can help with preparation of the application?
Answer: Yes, there are other reports also listed on our website such as the 2014 Hydropower Market Report (http://energy.gov/eere/water/downloads/2014-hydropower-market-report). You may also contact national and international associations and publishers such as the National Hydropower Association and Pennwell (the organizers of HydroVision) for more information. Please feel free to include any information that you think will strengthen your application for the review process.

Question 76: I understand that SBIR Phase 1 is typically considered a "feasibility study" phase, prior to a possible Phase 2 work effort. In phase 1, what type of work does DOE prefer to see done? What types of work does DOE prefer NOT to see done? i.e.: analytical modeling and design, CFD, economic projections, hardware prototyping, turbine or related hydraulic component scale modeling and testing.
Answer: Applicants are free to propose the scope of work per the requirement of their respective innovative technology, the level of work already performed, and how they perceive that their application would most favorably be considered by the reviewers per the requirements of the Funding Opportunity Announcement (FOA) and the topic description. There is no requirement for feasibility studies only to be performed under Phase I nor does DOE require specific studies to be performed prior to the application or in Phase I.

Question 77: Does this subtopic includes innovative technologies that would not use water-driven turbines, but would use water in another way, namely its lifting capacity?
Answer: DOE will consider innovative technologies that may not use a turbine but such technologies must generate power at less than 10 feet head or instream currents (in rivers, streams, canals or natural and man-made waterways). You may consider providing a 'Letter Of Intent' (LOI) per the Funding opportunity Announcement (FOA). DOE will provide a response if the technology proposed does not fit the topic description.

16. Wind

The Wind Program, part of the **Wind and Water Power Technologies Office**, works to enable rapid expansion of clean, affordable, and reliable domestic wind power to promote national security, economic vitality, and environmental quality.

a. Advancing Technology for Offshore Wind Resource Characterization.

Contact: joel.cline@ee.doe.gov.

Question 80: What measurements are most important for the sensor package to measure and at what data sampling rates?

Answer: Wind speed and direction profiles are important along with temperature and moisture profiles to derive stability and turbulence. Measurement profiles should be up to 200 meters to capture the full turbine swept area. Data sampling rates should be appropriate for input into rapid refresh weather models (hourly to every 15 minutes).

Question 81: Where will the sensors be placed and what are the size/weight/power requirements?

Answer: The sensors will be placed on government-owned buoys such as the AXYS buoys and/or NOAA buoys (http://www.ndbc.noaa.gov/). There are no exact size, weight, or power requirements but they should be able to accommodate buoys similar to an AXYS buoy or NOAA buoy.