

DRAFT

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**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**

**U. S. Department of Energy
Office of the Under Secretary**

**The DOE FY2010 Phase III *Xlerator* Program for
Energy Efficiency and Renewable Energy, Electricity Delivery and
Energy Reliability, Fossil Energy, and Nuclear Energy**

Funding Opportunity Number: DE-FOA-0000397

Announcement Type: Initial

CFDA Number: 81.122, 81.089, 81.121 and 81.087

Issue Date: July 9, 2010

Letter of Intent Due Date: Not Applicable

Pre-Application Due Date: Not Applicable

Application Due Date: August 4, 2010 at 11:59 PM Eastern Time

FOA APPLICATION INSTRUCTIONS

ELIGIBLE APPLICANTS: Only DOE Small Business Innovation Research (hereafter SBIR) or Small Business Technology Transfer (hereafter STTR) Phase I and Phase II grantees from FY 2005 to FY 2009 are eligible to apply to this U. S. Department of Energy Phase III Funding Opportunity Announcement (FOA).

Applicants are required to use the compatible version of Adobe Reader software to complete a [Grants.gov](#) Adobe application package. To ensure you have the [Grants.gov](#) compatible version of Adobe Reader, visit the download software page at http://www.grants.gov/help/download_software.jsp. Applicants must download the application package, application forms and instructions from [Grants.gov](#). [Grants.gov](#) website: <http://www.grants.gov/>

NOTE: REQUIREMENTS FOR GRANTS.GOV

Where to Submit:

Applications must be submitted through [Grants.gov](#) to be considered for award. You cannot submit an application through [Grants.gov](#) unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the [Grants.gov](#) Helpdesk at 1-800-518-4726 to verify that you are still registered in [Grants.gov](#).

Registration Requirements:

There are several one-time actions you must complete in order to submit an application through [Grants.gov](#) (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with [Grants.gov](#)). See <http://www.grants.gov/GetStarted>. Use the [Grants.gov](#) Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.doc> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and with [Grants.gov](#), should allow at least 21 processing days to complete these requirements. It is suggested that the process be started as soon as possible.

Important Notice to Potential Applicants: When you have completed the process, you should call the [Grants.gov](#) Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. [Grants.gov](#) registration).

Questions: Questions relating to the 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. The U. S. Department of Energy (DOE) cannot answer these questions. Part VII of this Funding Opportunity Announcement (FOA) explains how to submit other questions to the DOE.

Questions regarding the content of the FOA must be submitted through the

FedConnect portal at www.fedconnect.net. You must register with *FedConnect* to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses.

More information is available at

https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf.

DOE will try to respond to a question within three business days, unless a similar question and answer have already been posted on the website.

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> and

<http://www.compusearch.com/products/fedconnect/fedconnect.asp>.

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

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PART I – FUNDING OPPORTUNITY DESCRIPTION

The Department of Energy (DOE) invites all DOE SBIR/STTR Phase I and Phase II Awardees from FY 2005 to FY 2009 to submit Phase III grant applications. The Department may also consider peer-reviewed, high ranking successfully completed Phase I and Phase II awardees prior to FY 2005. However, this is only at the discretion and request of the DOE Project Officer. The purpose of Phase III is for the grantee to pursue commercial applications of work that derives from, extends, or logically concludes effort(s) performed under prior SBIR funding agreements, but is funded by a variety of sources other than the SBIR Program set-aside. In addition, it is intended that the small business applicant is in a position to pursue commercial applications of the R&D completed during and since the end of its Phase I or Phase II.

TECHNOLOGY AREAS OF INTEREST BY PROGRAM:

Office of Energy Efficiency and Renewable Energy

Biomass Technologies

1. Harvesting/Dewatering Technology for Algal Biofuels Production –

The Office of Biomass Program (OBP) is seeking Phase III applications to further commercial development of harvesting/dewatering processes- contingent upon successful completion of SBIR Phase I or Phase II development- to support the production of algal biofuels. Specifically, low cost and energy-efficient processes are sought that can be demonstrated and validated under field conditions to meet needs of the nascent algal biomass industry. Algae cultures tend to be relatively dilute, and the energy requirement to remove water from the cultures can be a significant portion of the energy balance. Additionally, few of current harvesting and dewatering technologies available today are amenable to scaling for larger production scenarios of 1,000 acre or larger algal farms. Several downstream technologies are being considered for the conversion of either whole (wet) algal biomass, or extracted fuel intermediates; it is understood that the harvesting/dewatering technology specifications must take downstream processing into consideration, yet remain flexible to the algae species being cultivated and the cultivation conditions (e.g. saline water). The successful application should seek to develop the prototype process in tandem with technology providers for both upstream and downstream operations, and do so at a sufficient scale (no less than 300,000 U.S. gallons/ 1,100 kiloliters of algae culture processed per day). Furthermore, the energy intensity of the successful harvesting/dewatering process should not exceed 10% of the energy content of the algal biomass being processed to ensure economic sustainability and commercial adoption.

Buildings Technologies

1. Transitional Technology for Organic Light Emitting Diodes (OLEDs)— Both small molecule and polymer OLEDs intended for solid state lighting (SSL) applications possess certain performance and manufacturing limitations, particularly when operated at the high current densities required for general illumination applications. These limitations are thought by many to impede their acceptance as viable light sources. A variety of new materials and architectures of OLEDs have been proposed to overcome these limitations, and the DOE has supported many of these approaches under prior awards, many of which have met the significant performance challenges, including efficacy, set forth in the multi-year program plan (MYPP). Some of these novel materials and systems have already

demonstrated that indeed, OLEDs may one day compete with LEDs for SSL market share. Still, OLEDs lag behind LEDs in product development and in particular, cost effective manufacturing. Therefore, grant applications are sought to advance candidate OLED devices for general illumination applications, which require brightness in the range of 1000 cd/m² for prolonged periods of time (>10,000 hours) and operation in hot environments (such as in the ceilings of commercial buildings, where temperatures can exceed 125 C). Proposed approaches should seek to achieve performance levels set forth in the MYPP and beyond, by producing improvements in blue light performance (spectrum, efficacy, and lifetime), charge injection and balancing, electrode materials (reflectivity, transparency, and conductivity), device stability and layer compatibility, out-coupling enhancements, and thermal management. Grant applications may address any of these areas or any other technical transitional area, provided sufficient justification is made relative to the price and performance goals of the MYPP. Grant applications are also sought to develop new, low cost manufacturing technologies to support the anticipated high volume manufacturing of OLEDs on flexible substrates or thin glass.

2. SSL Products made from Organic Light Emitting Diodes (OLEDs)—Today, nearly all product applications for Organic Light Emitting Diodes (OLEDs), Phosphorescent OLEDs (PhOLEDs), Polymeric OLEDs (POLEDs), etc., are for small area displays such as cell phones, personal digital assistants (PDAs), vehicular audio systems or other consumer electronics. However, recent progress in OLED technology suggests that selected general illumination applications in U.S. buildings may be possible. While the emissive properties of OLEDs are distinctly different than for LEDs, the unique properties of OLEDs including low distributed brightness, unique color attributes and low power may be effectively used for energy conserving applications including, but not limited to emergency lighting, signage, night-lights or other conspicuity applications. Grant applications are sought to develop viable products that use any type of OLED for an application that might be included in U.S. buildings and that reduces lighting load either by reducing total luminous output by judicious choice of spectrum or any other method.

3. “Core” Technology for Organic Light Emitting Diodes (OLEDs)—The OLEDs (both small molecule and polymer) intended for SSL applications possess critical limitations in practical lifetime, particularly when operated at the high current densities required for general illumination applications. These applications entail brightness in the range of 1000 cd/m² for prolonged periods of time (>10,000 hours) and operation in hot environments such as commercial buildings ceilings (where temperatures can exceed 125 C). A variety of new materials and architectures of OLEDs have been proposed to overcome these limitations, which could lead to numerous opportunities for improvement. Grant applications are sought to dramatically increase the performance of candidate OLED devices to MYPP levels by producing improvements in blue light performance (spectrum, efficacy and life), charge injection and balancing, electrode materials (reflectivity, transparency and conductivity), device stability and layer compatibility, out coupling enhancements, and thermal management. Grant applications also are sought to develop new and compatible manufacturing technologies to support the anticipated high volume, low cost manufacturing of OLEDs on flexible substrates or thin glass, in order to meet the aggressive price and performance goals of the MYPP.

Fuel Cell Technologies

1. Advanced Materials for Fuel Cell Technologies

The Office of Energy Efficiency and Renewable Energy (EERE) Fuel Cell Technologies Program is seeking Phase III applications to further develop new materials for use in fuel cells and fuel cell stacks, with a primary focus on increased durability at enhanced performance. The materials must

resist degradation by exposure to sub-freezing conditions, promote the rapid startup of the fuel cell system from cold ambient conditions to its normal operating conditions, and help to improve the fuel cell's performance during the start up and warm up periods. One particular area of interest is the development of membrane electrolytes and/or membrane electrode assemblies (MEAs) that are intrinsically tolerant of repeated freeze/thaw conditions, while maintaining high performance and durability under wide temperature range and relative humidity (RH) conditions.

2. Bio-Fueled Solid Oxide Fuel Cells

Fuels derived from biomass, when integrated with state-of-the-art solid oxide fuel cell (SOFC) technology, provide a substantial opportunity to reduce the burden on the current electrical distribution system, through greater availability of localized power generation, and to reduce the growth in the demand for natural gas, as well as enhance grid stability. Phase III applications are sought, to further develop and specifically demonstrate a promising system concept for bio-fueled SOFCs in distributed generation applications, with potential commercial viability. The system should include a fuel processor that reforms a biomass-derived product or bio-fuel into a fuel for a 1-30 kW-scale distributed SOFC system. An emphasis on bio-fuels, which are suitable for an SOFC and derived from sources (such as cellulosic biomass, agricultural residues, or municipal solid waste) that do not compete with food supply, is required.

Geothermal Technologies - High Temperature Tools and Sensors

1. High Temperature Downhole Tools – To develop tools capable of tolerating the extreme environment of supercritical reservoirs (374° C and 220 bar for pure water). These instruments may include but are not limited to: temperature and pressure sensors, flow meters, fluid samplers, inclination and direction sensors, acoustic instruments (high and low frequency), resistivity probes, natural gamma ray detectors, epithermal neutron scattering gauges, rock density gauges (gamma and sonic), casing monitoring devices (e.g. cement bond logs and casing collar locators), fluid conductivity, pH indicators and well dimension probes (caliper).

2. High-Temperature-High-Volume Lifting – To define the well fluids lifting requirements criteria needed by the geothermal industry for the foreseeable future; review alternative lifting systems and their potential for development to meet industry requirements; and research, design, develop, test and demonstrate a well fluid lifting system which will provide lifting of well fluid to meet the foreseeable pressure, temperature and longevity needs of the Enhanced Geothermal Systems (EGS) industry for the coming ten years.

3. High Temperature Downhole MWD Tools for Directional Drilling – To develop MWD tools capable of tolerating the environment of EGS reservoirs (up to 300 C) to guide directional drilling operations and facilitate characterization of the geothermal rock mass/reservoir during drilling. These instruments may include: temperature and pressure sensors, inclination and direction sensors, acoustic instruments (high and low frequency), resistivity probes, natural gamma ray detectors, epithermal neutron scattering gauges, rock density gauges (gamma and sonic), fluid conductivity, pH indicators and well dimension probes (caliper). Telemetry methods to transmit data to the surface may also be investigated.

Industrial Technology

1. Sensors and Controls — In industry, uninterrupted production has always been of paramount importance. Many manufacturing industries operate on narrow profit margins, so any system downtime can have major consequences for profitability. Industrial facilities require systems that

perform quickly, reliably, and cost effectively. Sensors, including industrial wireless sensor systems, hold tremendous potential to improve U.S. industrial productivity and product quality. The challenges to achieving the full potential of these systems will require technical advances that tap the expertise and resources of the diverse stakeholders in the technology. Sensor developers, wireless communications suppliers, computer processing specialists, and industrial end-users must work together to develop and demonstrate effective systems that perform successfully in plant operating environments. Proposed approaches must culminate in the development and commercialization of new sensor and control systems to be applied in manufacturing processes used in the U.S. Specifically Phase III proposals seek to develop (1) process sensors and their associated controls for in situ process measurement, especially for high-temperature or other harsh environment processes and (2) chemical and petroleum processing methods that do not rely on expensive analytical instrumentation.

2. Industrial Membrane Process Systems - Membranes are an important component in separations and used widely in industrial process streams. The aim is to commercialize innovative membrane systems that are robust enough to be integrated within real-world processes (e.g., inert gas removal, isomer separation, aromatic/non-aromatic separations, sulfur removal, CO₂ capture, and removal of trace metals). Applications should seek to address one or more of the following needs: (1) techniques for overcoming scale-up problems related to contaminants in industrial streams (fouling, oil misting, etc.), (2) manufacturing technologies that would reduce the cost of membrane modules, (3) anti-fouling and anti-flux schemes to improve the long-term operability of membrane systems, and (4) methods to regenerate membrane performance and lower membrane maintenance costs. Also of interest is the integration of membranes with other technologies (such as the integration of membranes with distillation systems, or with adsorption or extraction processes), in order to address specific process issues. The overriding goal is to enhance U.S. industrial process efficiency to the maximum possible extent by increasing the separation process efficiency.

3. Advanced Materials - Advances in materials science and engineering are likely to be key enablers for many energy efficiency and carbon reduction solutions. They could revolutionize the way energy is produced and/or consumed in the industrial setting. Applications are sought to further develop the manufacturability of or capabilities/properties of certain types advanced materials in the energy space; priority will be given to applications that carefully examine the achieved efficiency with the proposed improvements. Topic areas of interest in this solicitation include one or more from the following: (1) Functional materials including coatings, thin films, or catalysts: These types of materials interact with the environments they are situated in. Improvements could result in better system durability/ reliability and/or accelerated reactions/conversions, all of which could augment energy efficiencies. (2) Engineered polymers (EPs): Because of their high strength-to-weight ratios, these materials are often used as substitutes for structural members in various applications in the aerospace markets. Lighter aircraft and spacecraft result in reduced fuel consumption. The high cost for fabricating these EPs make them cost prohibitive for wide spread commercial use. Manufacturing processes that could significantly reduce the cost of EPs would allow them to be integrated into many new applications such as in vehicles, thereby imparting similar efficiency gains as observed with their use in the aerospace sector. (3) Strengthened glass: Glass produced today achieves only 0.5% of its ultimate lab-tested strength, requiring overbuilt product designs and limiting potential applications of this versatile, recyclable material. If new technologies could be developed to improve the strength of glass, a host of advantages could be realized including new lightweight products that will require less energy use in manufacturing and transportation. Strengthened glass could be integrated into more renewable energy and energy-efficient applications such as solar panels, high-efficiency "smart" windows, and lightweighted glass container.

4. Integrated Reaction-Separation Using Non-Thermal Processes - Reactions and separations in the chemical industry are coupled. Most chemical processes begin with a reaction and are followed by a separation of the product mixture into desired product, unreacted feedstock, and unwanted by-products. This topic will focus on project or projects that improve both reactions and separations together, especially using non-thermal processes. The opportunity to use this to break non idealities like equilibriums, isomers, and azeotropes is great. Potential projects should be in (1) Separation of isomers. Isomers are mixtures of components that have close boiling points making it impossible to separate them by thermal processes like distillation, (2) Breaking reaction equilibriums, and (3) Breaking azeotropes. Azeotropes are constant boiling mixtures.

5. Mitigation of Heat Losses, Fouling, and Scaling in Key Manufacturing Unit Operations -Heat exchange, fouling, and scaling in key processes like distillation, evaporation, crystallization, and reactors are energy intensive unit operations in the chemical industry. Energy losses are concentrated in heat exchangers and distillation units, including strippers, fractionators, etc. Condensers, air and product coolers, heat and refrigeration recovery units, all account for a large share of the heat exchanger losses. For the Phase III applications, the Industrial Technologies Program (ITP) is seeking (1) demonstration of enhanced and compact heat exchangers that will lower temperature differences between hot and cold streams in feed/effluent systems, minimizing external energy losses and improving overall thermal energy recovery (2) development of heat transfer systems that can be integrated within the process equipment that result in improvement of multi-phase flow patterns (3) demonstration of real-time monitoring systems for mitigation of fouling. Systems should be based on earlier DOE/ITP supported research that resulted in software, on-line fouling sensors, and on-line diagnostic tools for the analysis of fouling and implementation of countermeasures.

Solar Technologies - Lowering the Cost of Photovoltaics through Innovative Augmentation

There are a large number of new photovoltaic solar technologies competing for commercial acceptance, ranging from the very expensive but very high efficiency multi-junction (MJ) solar cells currently used in space applications, to the single and multi-crystalline silicon cells in broad terrestrial use, to the new thin film and organic solar cell technologies, although the latter still have very low efficiencies. At the high end, very high efficiency MJ (e.g. triple junction) cells are routinely manufactured today for space and terrestrial concentrating PV applications. Efficiencies are routinely to 30% and Lab demonstrations of >40% efficiency reported; such MJ cells are extremely expensive. The core manufacturing challenge for such high performing MJ PV solar cells in use today is heteroepitaxial growth of dissimilar semiconductor materials, as well as matching inexpensive starting substrates; an area of deep and long standing research. Most concentrating PV systems (significant reduction in material cost, to begin with) have been large, multi-axis tracking ones where the cost benefit is also derived through its large scale. An underexplored such implementation is concentrating collectors that can be deployed as static modules through different (flat-plate) approaches to the mechanism of concentration. Crystalline silicon represents the largest brand/source/type of PV wafers, and the two techniques for growing PV grade silicon (single crystal and multicrystalline) were developed 1 to 2 decades ago. Although single crystal cells have the highest efficiencies, the trimming and the expensive equipment and small scale of operation make these cells relatively expensive. Multicrystalline ingots suffer from yield losses due to the red zone (an incursion rich area around the perimeter that must be discarded).

1. Lightweight, Flexible and Low Cost Multi-junction Solar Cells—

If very high efficiency (to 30%) solar cells could be made at low cost as very lightweight, flexible panels it would be a significant breakthrough for the solar energy field; however, even today's best

thin film technologies fall short. To date, only the multijunction (MJ) photovoltaic technologies meet the efficiency goals, but are very expensive and comparatively heavy.

Even with efficiencies at 30%, the specific power of crystalline-based solar array systems has also been limited (<200 W/Kg), largely because thicker single crystal/MJ solar cells also require stiff and heavy support structures. Reducing the cost and mass of solar cells helps whatever the application, and a way that can potentially also make them flexible opens the door to numerous new design possibilities, from curved form factors for aesthetics or wider solar capture angles in Building Integrated Photovoltaics (BIPV), to PV surfaces that can flex with (e.g. portable) underlying structures, or fit odd spaces.

Innovative solutions are sought to make such high efficiency solar cells not only low cost, but lightweight and flexible; whether through substitution of substrate materials, novel deposition processes or a combination of both.

2. Static Module PV Concentrators— Like high ratio tracking PV concentrators, the promise is to reduce cost by replacing expensive PV cells with inexpensive reflectors. Unlike tracking concentrators, static modules have little or no tracking cost, reduced tolerances and lower thermal stress due to lower concentrating ratios. Compared to tracking concentrators, static modules are simple and easy to deploy and maintain. Since the 1970s there have been many R&D efforts, some as simple as positioning flat reflectors to augment the light striking conventional monofacial PV panels. Results have been mixed and designs somewhat complex, nevertheless the promise remains. Grant applications are sought for innovative static module PV concentrators that will significantly reduce the cost.

3. New Methods of Crystallizing Silicon— The two major techniques for producing crystalline silicon each have several advantages and disadvantages. Work has been done in the past on producing a hybrid of these techniques that would take into account the strengths of each while avoiding the weaknesses. Proposals are sought in the area of new crystallization techniques that can combine the benefits of monocrystalline silicon with high efficiencies, with the advantages of multicrystalline ingot casting techniques, such as high yields, low capital intensity and scalability to large sizes. Such techniques could involve seeding techniques or grain growth control to produce monocrystalline or near monocrystalline ingots. Such ingots should demonstrate improved efficiency, high yield, and the potential to scale up to very large sizes.

Vehicle Technologies

1. Technologies to Address Internal Heating in DC Bus Capacitors—Capacitors suitable for harsh automotive environments must suffer extreme environmental conditions. Film capacitors present an option for use as high voltage bus capacitors. However, they must accommodate high ripple currents, in a high temperature environment. There is a need for higher density lower resistivity foils to allow more ripple current capability with less heating. Applications are sought that use new materials and designs that allow better heat transfer out of the capacitor to reduce internal heating problems and increase life expectancy.

2. Improved Magnetic Materials for Motors—High-temperature, high-strength, lower-cost permanent magnets (PMs) are needed for traction motors for HEVs and PHEVs. The trend for higher-temperature electric machines requires higher-temperature PMs. The strength of the current

NeFeB PMs is weakened significantly as temperature rises. Grant applications are sought to develop new magnetic materials to allow low cost, easily manufacturable permanent magnets with energy products comparable to what is commercially available today with sintered magnets at temperatures up to 240°C. Grant applications are sought to produce stator and rotor core as well as magnet material with increased resistivity to improve electric motor efficiency by reducing eddy currents and to reduce fabrication costs, even for complex shapes. Grant applications are sought to economically produce core material and magnet material with high resistivity that would improve motor efficiency and reduce fabrication costs.

3. Advanced Materials for Lightweight Vehicles—Lightweight materials in automobile structures can provide significant fuel savings, but they also must be able to withstand or absorb the energy of impact in order to protect occupants in collisions. Grant applications are sought to develop rapid processing technologies for carbon fiber reinforced polymers that can be used in primary and secondary structures of passenger vehicles. Grant applications must show that the concept(s) can be cost-effectively incorporated into the high-rate, high volume manufacturing of commercial passenger vehicles.

Wind Technologies

1. Advanced Wind Power Technologies and Systems: The Wind and Water Power Program is seeking Phase III proposals that will enhance the commercialization potential of utility-scale technologies that significantly decrease the cost of energy and/or improve the reliability of wind power systems. Cost of energy reductions may involve decreasing capital costs, decreasing operations & maintenance costs (O&M), or improving the overall energy capture of a wind power system. The selection focus will be on companies who have successfully completed SBIR Phase I or Phase II development, but still require support to mitigate areas of risk that may be limiting access to private capital or stalling profitable growth. Applicants must describe the status of their technology, how it will lead to a decrease in the cost of energy or to an improvement in reliability, and how their technology fits into a commercially viable product or service offering. Furthermore, applicants should disclose current and future opportunities for outside investment and/or organic growth, and describe in detail how sources of risk to potential investors or customers would be mitigated through continued government support.

Office of Fossil Energy

1. Office of Fossil Energy (FE) supports R&D to help ensure that new technologies and methodologies will be in place to promote the efficient and environmentally sound use of America's abundant fossil fuel resources. FE seeks to advance successful Phase I or Phase II SBIR projects from their current stage of technical development to commercial readiness in the following program areas: 1) pollution control innovations for existing power plants (including post-combustion CO₂ capture, compression, and beneficial uses, oxy-combustion technology as well as water management); 2) advanced power systems (including gas separation membranes, gas cleanup, improved gasification technologies, advanced combustion systems, and improved turbines for future coal-based combined cycle plants); 3) development of stationary power fuel cells; 4) clean fuels (including hydrogen, synthetic natural gas, and ultra clean solid and liquid fuels from coal as well as mixed biomass and coal feed stocks which can result in neutral or negative carbon emissions, having

a beneficial effect on global warming); 5) carbon sequestration (a portfolio of technologies that can capture, separate, transport, reuse, and permanently store greenhouse gases); 6) improvements also are needed in our ability to recover both oil, natural gas, and methane hydrates; and 7) developments in advanced research including materials, sensors, monitors, controls, biotechnology, computational processes that will be needed for these technologies to be commercially competitive.

Office of Electricity Delivery and Energy Reliability

1. Smart Grid Technologies and Systems— The Office of Electricity Delivery and Energy Reliability (OE) Smart Grid R&D Program is seeking Phase III applications to further commercial applications of modeling, analysis, and decision support tools, after their successful completion of SBIR Phase I or Phase II development, for enhanced electric distribution system operations. Specifically, these tools are sought to be demonstrated and validated under field conditions to meet both the current utility application needs and the growing smart grid application needs. These needs encompass real-time distribution state estimation and dynamic optimization of distribution system operations, especially under smart grid applications with higher penetration levels of renewable energy systems, other distributed energy resources (including distributed generation, energy storage, and plug-in electric vehicles), and demand-side management in a distribution grid. Additionally, the application needs include those of a distribution grid with embodiment of advanced operational concepts such as microgrids and integrated AC/DC grid. The modeling, analysis, and decision support tools must address these application needs to enable the system operators to prioritize and optimize use of renewable energy, demand response, and consumer choice for both resources planning and operational optimization.

2. Electric Transmission Technologies— Advanced sensing, information, and communication technologies are needed to monitor and manage disturbance events in transmission and distribution (T&D) systems. These technologies are also critical for optimizing T&D system operations and asset utilization. Not only will the end-state of this grid modernization be a smart, reliable, and secure grid that protects against all disturbance events, but will also provide value-added services for economic prosperity. Low-cost monitoring of congested circuits will improve reliability and economic efficiency, increase transmission capacity, relieve congestion, reduce costs to consumers, and decrease operational risks. Grant applications are sought to develop low-cost, real time monitoring systems for overhead, high-voltage (69kV and above) transmission lines. Key parameters of interest include minimally invasive sensor systems that will measure some or all of the following: conductor sag, temperature, ampacity, current and voltage in real-time and with high accuracy. Projects should build on results of Phase II efforts and focus on verification and field testing of sensor device capabilities with low-cost potential to gain utility, transmission organization, and system operator acceptance.

3. Superconducting Technology for Power Equipment— Substantial worldwide advances have been achieved in recent years with respect to the development and processing of second generation, high temperature superconducting coated conductors (also known as “2G wires”). In addition, highly successful prototype high temperature superconducting equipment and devices are being demonstrated. Compared to first generation wires, 2G coated conductors have the potential of providing lower cost and higher performance. Nonetheless, further commercialization of technologies that can enhance the cost competitiveness of superconducting power equipment will be required. Priority technologies include: novel ultra-fast techniques to deposit epitaxial layers for low-cost 2G conductors and development of efficient, reliable and low cost cryogenic system and

components. Based on successful result of Phase II projects, projects are sought to further develop and demonstrate cost effective ultra-fast deposition methods for 2G HTS wires that can produce highly textured films (buffers and/or superconductor) and be scaled for manufacturability. Projects are also sought to develop efficient, reliable and low cost cryogenic systems and high performance cryogenic dielectric materials for HTS equipment. For use in superconducting power equipment, the HTS wires must be maintained economically at operating temperature in the range 63-83K. Further development in reliable cryocoolers and high performance cryogenic dielectric materials is needed. These cryocoolers should be capable of unattended, maintenance-free operation for at least 10 years and must offer the prospect of future price reductions to less than \$40/watt at 65K. Projects should build on Phase II efforts and could include refinement of cryocooler design, building of prototypes devices and testing to demonstrate key operating parameters. The new high performance cryogenic dielectric insulation materials should suitable for use in high voltage superconducting power equipment such as cable terminations the equipment should be capable of handling up to 138 kV in normal, steady-state operating conditions. Projects should build on Phase I or Phase II results and could include testing of new materials to develop design data, development of suitable, cost effective manufacturing technologies and testing and production of representative superconducting equipment parts.

4. Advanced Materials for Power Electronics and Energy Storage: Advanced materials will play a key role in advancing power electronics and energy storage for the modern grid. These materials enable these devices for a variety of utility applications that can provide improved power quality and reliability and energy/demand cost savings from load leveling. This topic solicits proposals in two areas: Power electronic devices based on wide band gap devices, and nano-engineered storage devices. a) Wide band gap device materials such as Silicon Carbide (SiC) are being developed rapidly and are being proposed for higher performance devices. Potential improvements over existing, commercial Silicon based devices include higher operating voltages, higher operating frequencies, increased efficiency, lower losses and higher operating temperatures. This area seeks advances in SiC based high power devices targeted toward distributed energy and utility applications. Projects should build on results from Phase I or Phase II efforts with emphasis on improvement of the design and rigorous testing of these devices and transitioning the technology into commercial manufacturing. b) The fundamental underpinnings of electrochemical energy storage devices (batteries, electrochemical capacitors, etc.) are the materials used in their construction. Through science based engineering and tailoring of these materials and their properties, a significant opportunity for potential improvement in device performance exists, including potential increases in energy density, improved rate capability (higher power), reduced corrosion, reduced rate of electrode failure (e.g. through sulfation), and increased lifetime. Projects should build on results from Phase I or Phase II efforts and demonstrate the applicability and cost potential of nano-engineered devices to improve the performance, reliability, life time and cost effectiveness of energy storage devices.

Office of Nuclear Energy

1. Advanced Instrumentation and Control, Radiation Resistant Sensors, and Wireless On-Line Monitoring Systems for Nuclear Power Plant Applications—Improvements and advances are needed for nuclear power reactor instrumentation and control systems and sensor component technologies that can withstand the extreme environments in current reactors and future Generation IV nuclear power plants. Grant applications are sought: (1) to improve and optimize the performance of the nuclear power systems using wireless on-line continuous monitoring systems that can be readily integrated with reactor instrumentation and control technology in order to improve the

reliability and accuracy of plant instrumentation, thermocouples, sensors, and controls that measure key reactor safety and plant operating parameters ; and (2) for robust, radiation-resistant instrumentation, sensors, and controls for Generation IV designs, including the very high temperature gas-cooled reactor (Next Generation Nuclear Plant) that can withstand temperatures in excess of 1400° C and extreme very high irradiation environments ($> 10^{14}$ n/cm²sec neutron flux levels) that will exist in current operating reactors and Generation IV high temperature gas-cooled reactor cores. Grant applications that propose to use the Idaho National Laboratory (INL) Advanced Test Reactor (ATR) National Scientific User Facility for demonstrating the performance of these extreme-condition instrumentation, sensors, or thermocouples are particularly sought for demonstration testing in the INL ATR.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT.

DOE anticipates awarding grants under this Funding Opportunity Announcement (FOA).

B. ESTIMATED FUNDING AND TECHNOLOGY AREAS OF INTEREST BY PROGRAM.

Approximately \$27 Million over three budget periods is expected to be available for awards under this FOA.

The approximate funding available for each program office is as follows: 1) Office of Energy Efficiency and Renewable Energy - \$20,000,000, 2) Office of Fossil Energy - \$4,000,000, 3) Office of Electricity Delivery and Energy Reliability - \$1,500,000 and 4) Office of Nuclear Energy - \$1,500,000.

In addition, specific projects under this Funding Opportunity Announcement (FOA) will be funded in whole or in part, with funds appropriated by the American Recovery and Reinvestment Act of 2009, Public Law 111-5, (Recovery Act or Act).

Special terms and conditions will be required on all projects receiving Recovery Act funding. These special terms and conditions will be based on provisions included in Titles XV and XVI of the Act. The special terms and conditions can be found at http://management.energy.gov/policy_guidance/1672.htm

Be advised that Recovery Act funds can be used in conjunction with other funding as necessary to complete projects, but tracking and reporting must be separate to meet the reporting requirements of the Recovery Act and related OMB Guidance. Applicants for projects funded by sources other than the Recovery Act must keep separate records for Recovery Act funds and to ensure those records comply with the requirements of the Act.

C. MAXIMUM AND MINIMUM AWARD SIZE

Ceiling (i.e., the maximum amount for an individual award made under this FOA): \$3,000,000 for Phase III RD&D awards.

Floor (i.e. the minimum amount for an individual award made under this FOA): \$250,000

D. EXPECTED NUMBER OF AWARDS

DOE anticipates making approximately 30 awards under this FOA depending on the size of the awards.

E. ANTICIPATED AWARD SIZE

The anticipated award size shall range from \$250,000 to \$3,000,000.

F. PERIOD OF PERFORMANCE

DOE anticipates making awards that will run from 12 months to 36 months over three budget periods. The first budget period will cover a period of 12 months. **Funding for the subsequent budget periods will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, and availability of funds.**

G. TYPE OF APPLICATION

DOE is accepting new Research Development and Deployment (RD&D) Phase III applications under this FOA. RD&D Phase III applications are requested for follow-on funding for a period subsequent to that provided by a previous Phase I or Phase II award. RD&D Phase III applications compete with all other applications and must be submitted by the required date. In preparing a RD&D Phase III application, applicants should assume that reviewers will not have access to previous applications. The application should be developed as 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 prior work.

PART III - ELIGIBILITY INFORMATION

A. ELIGIBLE PHASE III APPLICANTS

Only United States small business concerns (SBCs) that received Phase I or Phase II awards between FY 2005 and FY 2009 are eligible to submit Phase III applications. Joint ventures, as defined in "Appendices/Reference Material," may apply, provided the entity created also qualifies as a small business. A small business concern is one that, at the time of award for Phase III RD&D award, meets all of the following criteria:

1. Organized for profit, with a place of business located in the United States, which operates primarily within the United States or which makes a significant contribution to the United States economy through payment of taxes or use of American products, materials or labor;
2. In the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the form is a joint venture, there can be no more than 49% participation by other business entities in the joint venture;
3. At least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States, or it must be a for-profit business concern that is at least 51% owned and controlled by another for-profit business concern that is at least 51% owned and controlled by one or more individuals who are citizens of, or permanent resident aliens in, the United States -- (except in the case of a joint venture);
4. Has, including its affiliates, not more than 500 employees and meets the other regulatory requirements found in 13 C.F.R. Part 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 C.F.R. 121.3-2(a). The term "number of employees" is defined in 13 C.F.R. 121.3-2(t). Further information may be obtained by contacting the Small Business Administration at <http://www.sba.gov/size/>.

B. PARTICIPATION BY FEDERALLY FUNDED RESEARCH AND DEVELOPMENT CENTER (FFRDC) CONTRACTORS

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

1. Authorization for non-DOE/NNSA FFRDCs: The Federal agency sponsoring the FFRDC contractor must authorize in writing the use of the FFRDC contractor on the proposed project and

this authorization must be submitted with the application. The use of a FFRDC contractor must be consistent with the contractor's authority under its award and must not place the FFRDC contractor in direct competition with the private sector.

2. Authorization for DOE/NNSA FFRDCs: The cognizant DOE contracting officer must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization should be submitted with the application, if available, and in any case, must be submitted prior to any award. 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.

3. 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.

C. COST SHARING

Cost sharing is not required, but it is strongly encouraged. Commercial contributions will be considered as part of the evaluation criteria. See Part V, Section A, 2. Merit Review Criteria.

D. OTHER ELIGIBILITY REQUIREMENTS

The research, development and deployment (RD&D) must be performed in the United States for Phase III. "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 Phase III projects provided they are legally empowered to work in the U.S. at the time that an award is made.

1. Restrictions on the Level of Small Business Participation

Phase III - At least 50 percent of the research or analytical effort must be performed by the small business. 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 small business.

For those small businesses conducting cooperative RD&D jointly with a research institution, at least 40 percent of the work must be performed by the small business, and at least 30 percent of the work must be performed by a **single** research institution. The research institution must be the same as that used in the Phase I and II research, except under very unusual circumstances, which must be explained and approved by the DOE Project Officer. 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 small business, and at least 30 percent must be allocated to a single research institution.

A level of effort worksheet is provided to assist in calculating the analytical effort for the project.

2. Restrictions on the Principal Investigator (PI)

- a. General PI Requirements and Restrictions - The Principal Investigator (PI) is the key individual designated by the applicant to direct the project. The PI must be knowledgeable in all technical aspects of the grant application and be capable of leading the research effort. Because DOE's evaluation of the grant 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 10 hours per week if the project is less than 12 months in duration. For projects of duration greater than 12 months, the PI must devote 520 hours annually to the project. If the application is selected for funding, the PI will be required to sign a statement certifying adherence to all PI requirements. Applicants must state the duration of the project in weeks, in order to make clear that this requirement is fully met.

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. Before a grant is awarded, the PI will be required to sign a statement certifying adherence to these requirements. Non-U.S. citizens are eligible to perform work on Phase III projects provided they are legally empowered to work in the U.S. at the time that an award is made.

- b. Additional PI Restrictions when submitting to Phase III – Prior SBIR Awardees Only - To be awarded a Phase III grant, the applicant must meet the general requirements and the PI's primary employment must be with the small business 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 small business during the conduct of the project and no more than 19 hours per week spent in the employment of another organization.
- c. Additional PI Restrictions when submitting to Phase III – Prior STTR Awardees Only – to be awarded a Phase III grant, the applicant must meet the general requirements and the PI's primary employment may be with the small business or the research institution. However, the small business must still provide technical control and oversight of the project. If the PI is employed by the research institution, their primary employment (at least 20 hours per week) must be with the research institution in order to qualify under STTR.

3. Restrictions on the Management of Phase III Projects

All Phase III funding agreements are made with the small business regardless of the proportion of the work or funding of each of the performers (small business, research institution, subcontractor, etc.) under the grant. As the primary grantee, the small business has the overall responsibility of the project, including financial management and the direction and control of the performance. For projects where the principal investigator is from a research institution, the small business will maintain the overall supervision of the project, while the principal investigator will manage the research portion of the project.

It is recommended that all agreements between the small business and any subcontractor (including the research institution collaborating in a project) reflect the controlling management position of the small business during the performance of the Phase III. 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.

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 Application Package.” Enter the Catalog of Federal Domestic Assistance (CFDA) and/or the funding opportunity number located on the cover of this FOA and then follow the prompts to download the application package.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent

Letters of Intent are not required.

2. Pre-application

Pre-applications are not required.

C. CONTENT AND FORMS OF PHASE III APPLICATION

Part IV, Section C (this Section) describes all of the required and optional information that must be included in the grant application package. All of the following components (numbers 1-8) are required to be included in the grant application package or at least addressed. All of the information provided in response to numbers 1-8 below 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.

1. SF 424 (R&R). [MANDATORY]

Complete this form first to populate data in other forms. Complete all the required fields in accordance with the pop-up instructions on the form. To activate the instructions, turn on the “Help Mode” (icon with the pointer and question mark at the top of the form). The list of certifications and assurances referenced in Field 17 can be found on the DOE Financial Assistance Forms Page at http://www.management.energy.gov/business_doe/business_forms.htm , under Certifications and Assurances.

2. 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, Sections D, and F. Failure to comply may result in DOE’s inability to treat such information as proprietary and may delay the award process.

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 Department may make it available to the public after award. The project summary must not exceed 1 page when printed using standard 8.5” by 11” paper with 1” margins (top, bottom, left and right) with font not smaller than 11 point. Save this information in a file named “Summary.pdf,” and click on “Add Attachment” to attach.

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 or Phase II. Statements of future applications or benefits belong in the section on Commercial Applications and Other Benefits. The summary must include:

1. Company name
2. Project Title
3. Principal Investigator
4. Topic number/subtopic letter
5. Statement of the problem or situation that is being addressed. Describe the problem or situation being addressed – be sure that the Department of Energy 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).
6. General statement of how this problem is being addressed. This is the overall objective of the Phase III project. How is this problem being addressed? What is the overall approach of the Phase III project? (Typically one to two sentences).
7. What was done in Phase I or Phase II? (Typically two to three sentences).
8. What is planned for the Phase III project? (Typically, two to three sentences).
9. Commercial Applications and Other Benefits (limited to the space provided). Summarize the future applications or public benefits if the project is successfully completed and the technology is commercialized. Do not repeat information already provided above.
10. Key Words - Provide listing of key words that describe this effort.

11. Summary for Members of Congress: (layman’s terms, two sentences, maximum 50 words). The Department notifies members of Congress of awards in their districts. Therefore, please provide, in clear and concise layman’s terms, a very brief summary of the project, suitable for a possible press release from a Congressional office.

Suggested Format: In the first sentence, state the problem being addressed so that the research need is clear. In the second sentence, state what is being done to address the problem.

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

The project narrative is considered the “main” portion of the grant application.

Phase III grant applications must propose research, development, and deployment required to meet the DOE objectives stated in the technical topic of the original Phase I and Phase II FOAs and provide sufficient information to convince DOE and members of the research community who review the grant application that it is worthy of support under the stated evaluation criteria in **Part V**. The narrative should be written succinctly using the outline below, and limited to *no more than 50 pages* (this does not include the Commercialization Plan mentioned below). 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.

Proprietary Data Legend – If applicable. All documents must be appropriately marked. See Part VIII, Sections D and F

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. 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 Phase I or Phase II advanced the technology toward commercial viability - Discuss the purpose of your Phase I or Phase II research, subsequent research, the research carried out, the research findings or results, and your estimate of commercial viability. In particular, address the degree to which the Phase I or Phase II objectives have been met.

The Phase III application should include all relevant information concerning the research carried out in Phase I or Phase II and beyond. Technical reviewers are not always the same as used in Phase I or Phase II, and therefore may not be familiar with the Phase I or Phase II application.

The Phase III Project

- Technical Objectives - State the specific technical objectives of the Phase III RD&D.
- Work Plan - This section should be a substantial part of the technical proposal. Provide an explicit, detailed description of the Phase III research approach and work to be performed. Indicate what will be done, by whom (small business, subcontractors, or consultants) where it will be done, and how the work will be carried out.
- 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, development and deployment effort could lead to a product, process, or service. 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 small business is to be the primary grantee with overall responsibility for its performance.
- Performance Schedule - Phase III project performance period should cover between 12 months and 36 months. Continued funding beyond 12 months will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, and availability of funds. 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 III effort. Equipment is defined as an article of tangible, nonexpendable, personal property, including exempt property, charged directly to the award, having a useful life of more than one year and an acquisition cost of \$5,000 per unit or more. Items of equipment to be leased or purchased must be described and justified in this section. Title to equipment purchased under this award lies with the government. It may be transferred to the grantee where such transfer would be more cost effective than recovery of the property by the government. Awardees wishing to obtain title should contact their Contract Specialist prior to project completion for the procedure to follow to make such a request. If the equipment, instrumentation, and facilities are not the property of the applicant and are not to be purchased or leased, the source must be identified and their availability and expected costs specifically confirmed in this section. A principal of the organization that owns or operates the facilities/equipment must provide written verification regarding the availability and cost of facilities/equipment and any associated technician cost. Small businesses may get credit for obtaining this equipment as an in-kind Phase III commercial contribution.

- To the extent possible in keeping with the overall purposes of the program, only American-made equipment and products should be purchased with financial assistance provided under the Phase III awards. For those awardees receiving Recovery Act funding, special provisions in regards to American-made equipment and products will apply.

- Research Institution (for prior STTR awardees) – If the grant application contains substantial collaboration with a research institution, (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; and (2) describe in detail the work to be done by this institution in the Work Plan section; and (3) provided a detailed cost estimate including costs for labor, equipment, and materials, if any, as well as a specific statement certifying that they have agreed to serve in the manner and to the extent described in the Work Plan section of the grant application from research institutions.

- The research institution will be considered a subcontractor to the small business 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 grant application. The letter should be attached as an “other attachment” (see Part IV, Section C, 2). If selected for award, participation of the research institution will be verified by the Contracting Office.

- Other Consultants and 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 grant 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 (see Part IV, Section C, 2). If selected for award, the Contracting Officer will verify the participation of any subcontractors and/or consultants and will require budget and budget explanations for subcontractors and verification of the rates for consultants. Note: Consultants should not be employees of either the small business or any subcontractor. Non-U.S. citizens are eligible to perform work on Phase III projects provided he/she is legally empowered to work in the U.S. at the time that an award is made. None of the small business personnel can also be consultants or employees of a subcontractor.

- Phase III Funding Commitment – Although cost share is not mandatory, it is highly encouraged and will be considered as part of the evaluation criterion on Impact. In this section, describe this funding commitment. The commitment must be signed by a person with the authority to make it, indicate when the funds will be made available, and contain specific technical objectives which, if achieved in Phase III, 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 small business must demonstrate the ability to provide the Phase III funding); (3) state or local government financing; and (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 funding cannot be contingent on obtaining a patent because of the length of time this process requires. Letters merely expressing interest or intent without making a firm commitment, as described above, will receive no credit under this evaluation sub-criterion. The Phase III commitment must be submitted with the Phase III grant application as a separate attachment. Add as an attachment in field 12, "Other Attachments," on the form. You should also reference it in the technical application in the "Work Plan" section.

If applicant has no intention of providing Phase III Funding Commitments, it should be clearly stated in this section that no funding will be included in application. This statement should still be attached in field 12, "Other Attachments," on the form.

• **Bibliography & References Cited (Field 9 on the form).** [DO NOT USE THIS FIELD] READ BELOW.

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] READ BELOW 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] READ BELOW

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.

Also, attach the following files:

- Signed Letter(s) of Phase III Funding Commitment (if applicable).
- Signed Letter of Commitment from Research Institution (if applicable). Letter must include name and address of institution, dollar amount of subcontract, and Certifying Official's name, phone number and email address.
- Letters of Commitment from consultants, subcontractors or other third parties. The letters must state an agreement to serve in the manner and to the extent described in the "Work Plan" section of the technical proposal. This letter must also include a breakdown of costs (labor, materials, supplies, travel, etc.) and be signed by the consultant or subcontractor or authorizing party, certifying their availability and salary (for consultants). Note: Consultants are not employees of either the small business or any subcontractor.

- PI Certification (May be found at www.science.doe.gov/sbir/submission/picert.htm).
- Level of Effort Worksheet

See Level of Effort Worksheet Attachment to FOA

3. RESEARCH AND RELATED Senior/Key Person. [MANDATORY]

Complete this form before the Budget form to populate data on the Budget form. Principal Investigator and other Key Personnel - The Principal Investigator (PI) is the key individual designated by the applicant to direct the project. Only one PI is acceptable per project. The PI does not need to be a U.S. citizen; however, all work must be performed in the United States. See “Restrictions on the Principal Investigator” in Part III E, Other Eligibility Requirements for a full description of the roles and responsibilities of the PI.

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 grant 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. Subawardees and consultants must be included if they meet this definition. For each senior/key person provide:

a. 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 when printed on 8.5” by 11” paper with 1 inch margins (top, bottom, left, and right) with font not smaller than 11 point and must include:

- i. *Education and Training.* Undergraduate, graduate and postdoctoral training, provide institution, major/area, degree and year.
- ii. *Research and Professional Experience:* Beginning with the current position list, in reverse chronological order, professional/academic positions with a brief description.
- iii. *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.
- iv. Patents, copyrights, and software systems developed may be provided in addition to or substituted for publications.
- v. *Synergistic Activities.* List no more than five (5) professional and scholarly activities related to the effort proposed.

b. 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 subawardees, for ongoing projects and pending applications. For each organization providing support, show the total award amount for the entire award 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.

4. RESEARCH AND RELATED BUDGET [MANDATORY]

You must provide a separate budget for each year of support requested and a cumulative budget for the total project period. Applicants may request funding of up to \$ 3,000,000 for up to 36 months. The first budget period should cover a period of 12 months. Funding for the subsequent budget periods will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, and availability of funds. The amount budgeted for the first 12 month budget period should not exceed \$1,000,000.

Fully complete the Research and Related Budget form in accordance with the instructions on the form (Activate Help Mode to see instructions) 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 for allowability 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 Project Officer and the Phase III Portfolio Manager.

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

Provide the required supporting information for all proposed costs, including hours and rates for all personnel. Provide any other information you wish to submit to justify your budget request. Attach a single budget justification file for the entire project period in Field K. The file automatically carries over to each budget year. Please note, that if you are selected for an award, additional budget explanation will most likely be required.

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

Travel funds must be justified and related to the needs of the project. 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 cost unless written approval has been obtained from the Phase III Portfolio Manager.

With justification, Phase III grant funds may be used to pay up to \$20,000 in patent filing fees and related filing expenses for the U.S. patents for subject inventions developed under the Phase III

project. 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 as long as 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 small business.

- 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.

5. R&R SUBAWARD BUDGET ATTACHMENT(S) FORM. [IF APPLICABLE] Budgets for Subawardees (including research institutions).

You must provide a separate, cumulative R&R budget and budget justification for each subawardee that is expected to perform work estimated to be more than \$100,000 or 50 percent of the total effort (whichever is less).

Download the R&R Budget Attachment from the R&R SUBAWARD BUDGET ATTACHMENT(S) FORM and e-mail it to each subawardee that is required to submit a separate budget. Note: After the Subawardee has e-mailed its completed budget back to you, attach it to one of the blocks provided on the form. Use up to 10 letters of the subawardee's name (plus .xfd) as the file name (e.g., ucla.xfd or energyres.xfd). Additional budget information for any subawardee will likely be required if selected for award.

6. PROJECT/PERFORMANCE SITE LOCATION(S) [MANDATORY]

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided. Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions. Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

7. PHASE III INFORMATION FORM (ATTACHMENT 1 TO THIS FOA) [MANDATORY]

Complete all the required forms in accordance with the pop-up instructions on the form. To activate the instructions, turn on the "Help Mode" (icon with the pointer and question mark at the top of the form). For Question 7, the attachment should be in accordance with the following instructions:

a. Commercialization Plan (cannot exceed 15 pages, excluding Letters of Support).

A succinct commercialization plan must be included in the Phase III grant application. This information will be evaluated and considered part of the score for the "Impact" criteria discussed

in Part V. The 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 III funding. The depth and quality of the analysis within your Commercialization Plan is a critical element of the DOE Phase III proposal 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.

To help you prepare your plan, DOE maintains an SBIR Technical Assistance Portal at <http://doecapreg.foresightst.com>. Although you must register for access, there is no fee for use of the site. The site contains a variety of data and tools to help you prepare your Commercialization Plan.

The following four sections must be addressed in your Commercialization Plan:

Market Opportunity

- 1.** Describe succinctly what product or service you are planning to deliver based on your innovation.
 - a.** Who is your customer and what current or emerging needs will your product or service address?
 - b.** Describe the critical needs that your product or service is fulfilling for your customer.
 - c.** How does the target customer(s) currently meet the need that you are addressing and what do they pay to meet the need?
 - d.** What is your customer willing to pay for your product or service?
 - e.** What is the value proposition for your product or service?
 - f.** Are the customers located domestically, internationally, or both?

- 2.** Describe how your technology/innovation objectives and critical milestones enable you to address the market opportunity.
 - a.** What is the current size of the market you plan to enter, 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.)
 - b.** What are the growth trends for the market and the key market drivers that will affect whether customers will buy your product or service?

 - c.** What barriers to entry exist in this market which will inhibit sales of your product or service?

3. Describe the channels you would employ to reach the targeted customer?
4. What business model will you adopt to generate revenue from your innovation?
 - a. Will you make and sell? License? Form a strategic alliance with a company already in the industry? Use a different model?
 - b. Explain why this model makes sense for the market opportunity described.
5. 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.

Competition/Intellectual Property

1. 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.
 - a. How does your product or service match up to these substitutes in terms of the needs customers are seeking to meet?
 - b. 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?
2. Describe intellectual property (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.
3. 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.
4. What other IP will you need to secure rights to make, use, or sell in order to address the market opportunity described above?

Company/Team

1. Provide a short description of the origins of the company.
2. What type of corporate structure is in place?
3. What is the current capitalization and is it sufficient for implementing your Commercialization Plan?
4. What is the revenue history for the past three years?
5. 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?

6. What is the current employee count?
7. 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.
8. What specific experience does the team lack and how will this be addressed during the remainder of the Phase III effort and beyond?
9. From what additional resources do you have commitments that address “8” above, e.g., Board of Directors, technical advisors, or retained legal counsel; and please provide details on names, affiliations, and expertise of these resources?

Finance and Revenue Model

1. What are your costs to complete research and development, product, and production development/design/engineering, and to produce the product or service?
2. What are the costs required to implement your commercialization strategy?
3. Provide a table with costs for “1” and “2” and the revenues or other operating capital you can devote to these. If there is a shortfall, describe an appropriate staged finance plan that will provide the necessary cash given the market opportunity described above. If no additional cash is needed explain why you are confident that is the case.
4. Describe the revenue streams (licensing, product sales or other) associated with your Commercialization Plan.
5. When do you anticipate “first revenues” from each stream?
6. When do you expect to reach “break even”?
7. Provide annual pro formas for the next five years (three years of the Phase III effort + 2 years’ post Phase III). 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 available upon request from DOE.
8. Explain how you will raise or access the appropriate funds during and post-Phase III and beyond. Provide specific contacts, leads, previous relationships, and agreements already in place.
9. Are any other commitments in place which will affect your ability to raise Phase III follow-on funding?

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.

8. SF-LLL DISCLOSURE OF LOBBYING ACTIVITIES

If applicable, complete SF- LLL. Applicability: 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."

Summary of Required Forms/Files

Your application must include the following documents:

| Name of Document | Format | Attach to |
|---|---------------|-----------------------------|
| SF 424 (R&R) | PDF | N/A |
| RESEARCH AND RELATED Other Project Information | PDF | N/A |
| Project Summary/Abstract | PDF | Field 7 |
| Project Narrative, including required appendices | PDF | Field 8 |
| Signed Letter(s) of Phase III Funding Commitment (if applicable) | PDF | Field 12 |
| Signed Letter of Commitment from Research Institution (if applicable) | PDF | Field 12 |
| Letters of Commitment from third parties (if applicable) | PDF | Field 12 |
| PI Certification | PDF | Field 12 |
| Level of Effort Worksheet | PDF | Field 12 |
| RESEARCH & RELATED Senior/Key Person Profile (Expanded) | PDF | N/A |
| Biographical Sketch | PDF | Attach to appropriate block |
| Current and Pending Support | PDF | Attach to appropriate block |
| RESEARCH & RELATED BUDGET | PDF | N/A |
| Budget Justification | PDF | Field K |
| R&R SUBAWARD BUDGET (if applicable) | PDF | N/A |
| PROJECT/PERFORMANCE SITE LOCATION(S) | PDF | N/A |
| Phase III Information Form | PDF | Field 12 |
| Commercialization Plan for Phase III | PDF | Attach to appropriate block |
| SF-LLL Disclosure of Lobbying Activities, if applicable | PDF | N/A |

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

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

1. Indirect cost information
2. Fee justification
3. Other budget information
4. Assurance of Compliance point of contact information
5. Representation concerning financial management system
6. Consultant documentation/verification of rates
7. Representations of Limited Rights Data & Restricted Software, if applicable
8. Any submission incorporating data affecting national security will not be accepted for evaluation.

E. SUBMISSION DATES AND TIMES.

1. Pre-application Due Date

Pre-applications are not required.

2. Application Due Date. Applications must be received by August 4, 2010, not later than 11:59 PM Eastern Daylight Time. Modifications will be accepted if received by the due date and deadline time. You are encouraged to transmit your application well before the deadline.

F. INTERGOVERNMENTAL REVIEW.

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

G. FUNDING RESTRICTIONS.

Funds will be allocated annually up to three budget periods. Funding for each budget period will be contingent on the demonstration of adequate progress, evaluation of programmatic priorities, and availability of funds.

Cost Principles: Costs must be allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. The Cost Principles for Commercial Organizations may be found at [FAR Part 31](#).

Pre-award Costs: Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar-day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR Part 600. Recipients must obtain the prior approval of the Contracting Officer for any pre-award costs that are for periods greater than this 90 day calendar period.

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

Part V - APPLICATION REVIEW INFORMATION

A. Criteria

1. **Initial Review Criteria** Prior to a comprehensive merit evaluation, the Phase III Program will perform an initial review to determine that 1) the applicant is eligible for award; 2) the information required by the announcement has been submitted; 3) all mandatory requirements are satisfied; and 4) the proposed project is responsive to the objectives of the FOA. Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. **Merit Review Criteria** The Phase III grant application must contain enough information on progress accomplished under Phase I or Phase II, by the time of Phase III grant application submission, to enable an evaluation of the project's promise if continued into Phase III. Phase III grant applications will be evaluated for technical merit using the following equally weighted criteria:

A. **Strength of the scientific/technical approach** as evidenced by: (1) the strength and innovativeness of the overall idea and approach for the combined Phase III project, and (2) the significance of the scientific or technical challenge.

B. **Ability to carry out the project in a cost effective manner** as evidenced by: (1) the qualifications of the Principal Investigator, 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/II objectives, the degree to which Phase I/II 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.

C. **Impact** as evidenced by: (1) the significance of the technical and/or economic benefits of the proposed work, if successful, (2) the likelihood that the proposed work could lead to a marketable product or process, (3) the likelihood that the project could attract further development funding and/or third party investments during and after the project ends, (4) Phase III Funding Commitment, and (5) Commercialization Plan. Phase III applications will be evaluated for commercial potential using the Commercialization Plan data and other information provided by the applicant in the following four sections (1) Market Opportunity, (2) Competition/Intellectual Property, (3) Company/Team, 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. The key points required for each section are further described in Part IV, Section C.

3. Other Selection Factors.

A. The Selection Official may consider other program policy factors such as program balance of funds distribution and needs of the technical programs.

B. REVIEW AND SELECTION PROCESS.

1. Merit Review

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

2. Selection

Each technical program area participating in the Phase III Program is provided a predetermined target number of applications that they may select for funding. The number is proportionate to their Phase III funding contribution. The grant 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 Phase III budget is exhausted. The Selection Official may also consider other program policy factors such as program balance and needs of the technical programs.

3. 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 10 CFR 600; and/or (4) special terms and conditions are required. Failure to satisfactorily resolve the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES.

The DOE anticipates making awards by September 30, 2010.

Part VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES.

a. Notice of Selection.

The Phase III Program will notify all applicants that request funding of the outcomes via email. This notice of selection is not an authorization to begin performance. (See Section IV.G with respect to the allowability of pre-award costs).

b. 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 Summary; 6 Federal Assistance Reporting Checklist and Instructions, which identifies the reporting requirements; and 7. DOE assistance regulations at 10 CFR Part 600.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS.

Terms and Conditions and National Policy Requirements.

If a grant is awarded, the recipient must comply with the terms and conditions in the formal award document provided by the Contracting Officer at the time of award. The National Policy Assurances to be incorporated as award terms are located at the following web address http://management.energy.gov/business_doe/1374.htm.

C. REPORTING.

Reporting requirements are identified on the Federal Assistance Reporting Checklist and Instructions, DOE F4600.2, which will be attached to the award agreement.

PART VII - QUESTIONS/AGENCY CONTACTS

A. Questions: Questions relating to the 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. U. S. Department of Energy (DOE) cannot answer these questions. Part VII of this announcement explains how to submit other questions to the DOE.

Questions regarding the content of the announcement must be submitted through the *FedConnect* portal at www.fedconnect.net. You must register with *FedConnect* to respond as an interested party to submit questions, and to view responses to questions. It is recommended that you register as soon after release of the FOA as possible to have the benefit of all responses. More information is available at https://www.fedconnect.net/FedConnect/PublicPages/FedConnect_Ready_Set_Go.pdf. DOE will try to respond to a question within three business days, unless a similar question and answer have already been posted on the website.

B. Agency Contact

- Name: Charles Russomanno, Portfolio Manager
FY 2010 Phase III *Xlerator* Program
U.S. Department of Energy
- E-mail: Charles.russomanno@ee.doe.gov
- Phone: 202-586-7543

PART VIII - OTHER INFORMATION

A. MODIFICATIONS.

Notices of any modifications to this announcement 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> and <http://www.compusearch.com/products/fedconnect/fedconnect.asp>.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE.

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

C. COMMITMENT OF PUBLIC FUNDS.

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by anyone other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION.

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

“The data contained in pages _____ of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government’s right to use or disclose data obtained without restriction from any source, including the applicant.”

NOTE: The proprietary data legend on the first page of your project narrative must separately identify those pages of the application which contain proprietary technical data from any pages which contain other types of proprietary information as defined by the funding opportunity notice (e.g., confidential personnel information, or proprietary commercial or financial information).

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following: “The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation.” Failure to follow these instructions, or a discrepancy between the pages listed on the first page of the project narrative and the pages actually marked may result in DOE’s inability to treat such information as proprietary and will delay the award process.

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 or independent commercialization experts. 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 and administrative personnel must sign conflict of interest and non-disclosure statements prior to reviewing an application.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM.

a. **Proprietary Information** – Information contained in unsuccessful grant applications will remain the property of the applicant. The government will retain for three (3) years one file copy of each unsuccessful grant application. Public release of information in any grant 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 a grant 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.

NOTE: The proprietary data legend on the first page of your project narrative must separately identify those pages of the application which contain proprietary technical data from any pages which contain other types of proprietary information as defined by the funding opportunity notice (e.g., confidential personnel information, or proprietary commercial or financial information). 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 grant application from further consideration and without assuming any liability for inadvertent disclosure.

b. **Protection of Grant Application Information** – DOE's policy is to use data included in grant 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 grant 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 grant application will be used only for evaluation purposes and will not be further disclosed.

c. **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 grant applications submitted in response to this solicitation, shall remain with the recipient, 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 4 years from delivery of the last deliverable under that agreement (either Phase I, Phase II, or Federally funded SBIR Phase III). Agencies are released from obligation to protect SBIR data upon expiration of the protection period except that any such data that is also protected and referenced under a subsequent SBIR award must remain protected through the protection period of that subsequent SBIR 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.

d. **Copyrights** – With prior written permission of the cognizant DOE Contracting Officer, the recipient 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.

e. **Patents** – Small businesses 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.

f. **Distribution of Intellectual Property and Commercialization Rights Between the Small Business and Subcontractor** – When using subcontractors, including research institutions, the small business is responsible for providing that its subcontractors retain all rights provided for the small business. Large business subcontractors may make a request to retain title to inventions pursuant to 10 CFR 784.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER.

N/A

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES.

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