Small Business Innovation Research
Small Business Technology Transfer
Energy Independence and Security Act
Annual Report
FY 2015

America's Seed Fund Powered by the SBA

Small Business Administration

Office of Investment and Innovation
409 3rd Street SW
Washington, DC 20416

www.sbir.gov
(571) 306-5201

Table of Contents

Introduction _____ 2

Department of Agriculture (USDA) _____ 3

Department of Commerce (DOC) _____ 5

Department of Defense (DOD) _____ 6

Department of Education (ED) _____ 34

Department of Energy (DOE) _____ 36

Department of Health and Human Services (HHS) _____ 50

Department of Homeland Security (DHS) _____ 51

Department of Transportation (DOT) _____ 53

Environmental Protection Agency (EPA) _____ 54

National Aeronautics and Space Administration (NASA) _____ 57

National Science Foundation (NSF) _____ 61

Introduction

Pursuant to the Energy Independence and Security Act of 2007 (Pub. L. No. 110-140) and Policy Directives issued by the SBA, Agencies must give high priority to small business concerns that participate in or conduct energy efficiency or renewable energy system R&D projects. Agencies utilize a variety of approaches to comply with the EISA and Policy Directives. For some, such as DOE, these efforts are engrained in the Agency mission and therefore easy to assess in very tangible ways. However, for Agencies with R&D needs that are completely different, such as ED or HHS, EISA compliance requires creative solutions. Mechanisms commonly used by Agencies – aside from specifically adding energy related topics in solicitations – include adding that solicitation proposals address any energy efficiency or renewable energy aspects related to the small businesses' technological approach, delivery or technological applicability and often provide such proposals a competitive advantage in the award selection process. Cross-Agency collaborations, outreach efforts, and other initiatives also become critical to assessing the collective achievements of the program rather than focusing on individual Agency performance. Each Agency's Annual Report addresses EISA compliance by including: examples of SBIR/STTR projects related to energy efficiency or renewable energy; procedures and mechanisms used during the reporting fiscal year to give priority in the SBIR/STTR to energy efficiency and renewable energy projects; and, specific actions taken to promote and support energy efficiency and renewable energy research projects.

Department of Agriculture (USDA)

Examples of USDA SBIR/STTR projects related to energy efficiency or renewable energy

Firm Name	Topic Number	Project Title	Award Value
EWindSolutions, Inc.	8.12	Next Generation Wind Energy Systems For Cash-Strapped Farmers And Communities	$100,000
Orb Technologies, LLC	8.6	The Sustainable Workforce Affordable Power Initiative (SWAP) - Utilizing Near Zero Energy Home Replacements	$99,993
HM3 Energy, Inc.	8.1	Development and Evaluation of Continuous Biomass Torrefaction and Densification Process for Commercial Briquette Production	$500,000
Greenwood Clean Energy, Inc.	8.12	Evaluating Source and Control Methods for Small Scale Hydronic Heaters	$436,324
Forest Concepts, LLC	8.13	Model Based Control for Dryer Energy Conservation	$499,997

Procedures and mechanisms USDA used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

Within the USDA SBIR solicitation are listed two crosscutting priorities that apply to the entire USDA SBIR program. These are Energy Efficiency and Alternative and Renewable Energy. Applicants are directed to indicate if they meet these crosscutting areas within their Project Narrative by responding to the following section “Responsiveness to USDA SBIR Program Priorities”. If a proposal is responsive to the Energy Efficiency and Alternative and Renewable Energy issue the proposal will be given extra consideration during the review process.

Specific actions USDA has taken to promote and support energy efficiency and renewable energy research projects

Several of the USDA SBIR topic areas give priority and visibility to energy efficiency and/or alternative and renewable energy and in that way applicants are encouraged to submit

proposals that deal with either or both of these issues. Topic areas that promote energy efficiency and/or alternative and renewable energy are:

8.1 Forests and Related Resources

8.6 Rural and Community Development

8.7 Aquaculture

8.8 Biofuels and Biobased Products

8.12 Small and Mid-Size Farms

8.13 Plant Production and Protection - Engineering

Department of Commerce (DOC)

Examples of DOC SBIR/STTR projects related to energy efficiency or renewable energy

NIST made a Phase I award to Amethyst Research Inc. in the area of climate change and clean energy. The awardee will engineer, build, and demonstrate a trap-detector design that takes advantage of modern uniform, large-area infrared detectors. The goal is to market such detectors to the infrared measurement community, for applications including radiation thermometry.

Procedures and mechanisms DOC used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

Consistent with Executive Order 13329, DOC gives high priority to small businesses that participate in or conduct energy efficiency of renewable energy system R&D projects.

Specific actions DOC has taken to promote and support energy efficiency and renewable energy research projects

DOC only had one award in this area as listed above.

Department of Defense (DOD)

The Department of Defense Office of Small Business Programs generated this report in response to SBA's request for information regarding implementation of Public Law 110-140: Energy Independence and Security Act of 2007. To this purpose, DOD components reported on: (1) Examples of SBIR/STTR projects related to energy or renewable energy; (2) Procedures and mechanisms used to give priority to energy efficiency and renewable energy projects; and, (3) Specific actions conducted to promote and support energy efficiency and renewable energy projects. For example, DOD collaborated with TechConnect World's annual Defense Energy Summit, held in Austin TX during November 2015. DOD SBIR/STTR releases three solicitations per year and included in these solicitations are topics related to and promoting energy efficiency and renewable energy.

Energy Related SBIR/STTR Awards FY15				
Agency	**Phase I Dollar Amount**	**Phase I Award Count**	**Phase II Dollar Amount**	**Phase II Award Count**
Air Force	$5,021,237	34	$1,499,418	2
Army	$8,537,491	52	$6,750,552	9
CBD	$0	0	$0	0
DARPA	$449,049	4	$8,457,032	7
DHP	$0	0	$	0
DLA	$0	0	$	0
DTRA	$0	0	$0	0
MDA	$875,000	7	$5,000,000	5
Navy	$11,315,028	136	$8,775,612	27
OSD	$690,916	5	$3,995,306	4
SOCOM	$899,873	6	$1,495,208	1
DOD TOTAL	**$27,788,594**	**244**	**$35,973,128**	**55**

Examples of DOD SBIR/STTR projects related to energy efficiency or renewable energy

In FY15, DOD's energy related awards totaled $27,788,594 for 244 Phase I awards and $35,973,128 for 55 Phase II awards. The following table lists examples of projects from the Air Force, Army, DARPA, MDA, Navy, OSD, and SOCOM related to energy efficiency and renewable energy.

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Soluxra, LLC	Air Force	F13A-T060082	High specific power and cost effective solar array for spacecraft, lighter than air vehicles, and UAVs	$149,995	Completed Phase I
Hyper Tech Research Inc.	Air Force	F141-0621697	Lightweight Electric Wires and Cables from CNT-Cu Composites for Airborne Platforms	$150,000	Completed Phase I
Structured Materials Industries	Air Force	F141-0621929	Lightweight Graphene Wire Production	$149,999	Completed Phase I
Leucadia Engineering LLC	Air Force	F141-0680837	Generic Power/Propulsion Microcontroller for Unmanned Aircraft Systems (UAS)	$149,876	Completed Phase I
New Eagle Consulting LLC	Air Force	F141-0681343	Generic Power/Propulsion Microcontroller for Unmanned Aircraft Systems (UAS)	$149,826	Completed Phase I
PC Krause and Associates, Inc.	Air Force	F141-0801842	Air Cycle Toolsets for Aircraft Thermal Management System (TMS) Optimization	$149,998	Completed Phase I
Mainstream Engineering Corporation	Air Force	F141-0802351	Rapidly Configurable Turbomachines for Air Cycle Machine Emulation	$149,978	Completed Phase I
(ES3) Engineering & Software System Solutions	Air Force	F141-2030615	Improved LHE Zn-Ni and Cd Plating Process	$150,000	Completed Phase I
L. Raymond & Associates	Air Force	F141-2031397	Innovative Process for Developing Improved LHE Zn-Ni and Cd Baking Process	$77,102	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
PH Matter, LLC	Air Force	F141-2041271	Improve Energy Source for NDI Equipment Tools	$149,999	Completed Phase I
Mainstream Engineering Corporation	Air Force	F141-2042146	Innovative DMFC Power Supply for NDI Hand Tools	$149,965	Completed Phase I
FTL Labs Corporation	Air Force	F141-2110893	Enhanced Fuel Cells from Wastewater Treatment (Bacteria Generated System) as a Renewable Energy Source	$149,582	Completed Phase I
Cambrian Innovation, Inc.	Air Force	F141-2111732	BioVoltTM Self-Powered Wastewater Treatment System: Accelerated Anaerobic Digestion via Bioelectrochemical Reactions	$146,893	Completed Phase I
Advanced Technologies Group, Inc.	Air Force	F151-0560541	Advanced Ram Air Turbine Auxiliary Power Unit for High Altitude Long Endurance Aircraft	$149,961	Active Phase I
Creare LLC	Air Force	F151-0561151	Closed-Loop Turbo-Brayton Power System for High-Altitude Aircraft	$149,962	Active Phase I
NexTech Materials, Ltd.	Air Force	F151-0561293	SOFC Based APU for Unmanned Aerial Systems	$149,999	Active Phase I
Florida Turbine Technologies, Inc.	Air Force	F151-0590762	Advanced Component Cooling Design and Evaluation for Gas Turbine Engines	$149,943	Active Phase I
Mechanica Solutions, Inc.	Air Force	F151-0591697	Advanced Component Cooling Design and Evaluation for Gas Turbine Engines	$149,995	Active Phase I
Space Information Laboratories, LLC	Air Force	F151-0670220	Advanced Electrochemical Power Sources and Lithium-Ion Batteries for Space Launch Vehicles	$149,983	Active Phase I
BST Systems Inc.	Air Force	F151-0670961	Advanced Electrochemical Power Sources and Lithium-Ion Batteries for Space Launch Vehicles	$149,608	Active Phase I
LaunchPoint Technologies, Inc.	Air Force	F151-0700734	Modular Motor Drive with Programming and Configuration Tools for the Development of Small Aircraft Electric Power and Propulsion Systems	$149,921	Active Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Boston Engineering Corporation	Air Force	F151-0701581	Modular Motor Drive with Programming and Configuration Tools for the Development of Small Aircraft Electric Power and Propulsion Systems	$149,996	Active Phase I
PC Krause and Associates, Inc.	Air Force	F151-0702195	Modular Motor Drive with Programming and Configuration Tools for the Development of Small Aircraft Electric Power and Propulsion Systems	$149,996	Active Phase I
Angstrom Designs, Inc.	Air Force	F151-0760970	Constellation Array Design and Analysis Study	$149,601	Active Phase I
Vanguard Space Technologies, Inc.	Air Force	F151-0761713	Advanced Solar Array for Dual Launch GPS	$149,579	Active Phase I
Creare LLC	Air Force	F151-0840613	A Modular Power Converter for Austere Space Environments	$149,896	Active Phase I
QorTek, Inc.	Air Force	F151-0841385	High-Temperature, Radiation-Hard and High-Efficiency DC-DC Converters for Space	$149,963	Active Phase I
Lynntech, Inc.	Air Force	F151-0850646	Advanced Li ion battery with improved cycling stability	$150,000	Active Phase I
Solid Power, Inc.	Air Force	F151-0851899	High Energy, Long Life Solid-State Batteries for Air Force Spacecraft	$149,960	Active Phase I
Lynntech, Inc.	Air Force	F151-0880707	Ultrahigh Specific Energy and Specific Power Ultracapacitor	$149,999	Active Phase I
ADA Technologies, Inc.	Air Force	F151-0881181	High Energy and High Power Density Pseudocapacitor for Spacecraft	$149,981	Active Phase I
MicroLink Devices	Air Force	F151-0950536	High-Efficiency, Radiation-Hard Double Epitaxial Lift-Off MultiJunction Solar Cell	$150,000	Active Phase I
Semprius, Inc.	Air Force	F151-0952231	40 Percent Air Mass Zero Efficiency Solar Cells for Space Applications	$149,753	Active Phase I
Spectral Energies, LLC	Air Force	F15A-T200183	MHZ-Rate Nonlinear Spectroscopy and Imaging Platform for Transient and Nonequilibrium Flows	$149,928	Active Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Mainstream Engineering Corporation	Air Force	F2-8174	Rapidly Configurable Turbomachines for Air Cycle Machine Emulation	$749,418	Active Phase II
Hyper Tech Research Inc.	Air Force	F2-8259	Lightweight Electric Wires and Cables from CNT-Cu Composites for Airborne Platforms	$750,000	Active Phase II
Morton Photonics Incorporated	Army	A14A-0050024	Ultra-Coherent Semiconductor Laser Technology	$149,999	Completed Phase I
Telaris Inc.	Army	A14A-0050029	Ultra-Coherent Semiconductor Laser Technology	$150,000	Completed Phase I
Q Peak, Inc.	Army	A14A-0060054	Few-optical-cycle LWIR laser system	$149,992	Completed Phase I
NP Photonics, Inc.	Army	A14A-0060142	Powerful Source of Collimated Coherent Infrared Radiation with Pulse Duration Fewer than Ten Cycles	$149,738	Completed Phase I
Lynntech, Inc.	Army	A14A-0070030	Microplasma Vaporization Technology for Novel Magnesium Alloys and Composites	$149,995	Completed Phase I
Directed Vapor Technologies International	Army	A14A-0070178	High-Performance Magnesium Alloys and Composites by Efficient Vapor Phase Processing	$149,720	Completed Phase I
N5 Sensors, Inc.	Army	A14A-0080047	Two-Dimensional MoS2 Transistors for Low Power RF Applications	$149,309	Completed Phase I
Kyma Technologies, Inc.	Army	A14A-0080120	Low Power Monolayer MoS2 Transistors for RF Applications	$150,000	Completed Phase I
Applied Novel Devices	Army	A14A-0080176	Low Power Monolayer MoS2 Transistors for RF Applications	$150,000	Completed Phase I
RDMChem LLC	Army	A14A-0130043	Parallel Two-Electron Reduced Density Matrix Based Electronic Structure Software for Highly Correlated Molecules and Materials	$150,000	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Q-Chem, Inc.	Army	A14A-0130061	Parallel Two-Electron Reduced Density Matrix Based Electronic Structure Software for Highly Correlated Molecules and Materials	$149,462	Completed Phase I
Zetroz	Army	A14A-0160081	Hydrogel-based Long duration ultrasound wound dressing to enhance cellular regeneration and rapid wound closure	$149997	Completed Phase I
Perfuzia Medical	Army	A14A-0160166	Development of novel wound dressing technology combining advanced hydrogel and perfusion enhancement technologies.	$149,373	Completed Phase I
Robotic Research LLC	Army	A14A-0180157	Terrain Aware Mobility Planning (TAMP)	$149,989	Completed Phase I
Quantum Signal, LLC	Army	A14A-0180183	Robust Terrain-Adaptive Vehicle Planning and Control	$150,000	Completed Phase I
Combustion Research and Flow Technology, Inc.	Army	A15A-0020054	Advanced Computational Technologies for Multiphase Internal/External Coupled Ballistic Flows	$149,999	Active Phase I
Simmetrix, Inc.	Army	A15A-0020093	Tools for Parallel Adaptive Simulation of Multiphase Ballistic Flows	$149,127	Active Phase I
Intraband LLC	Army	A15A-0030064	High-Power, Monolithic THz Sources via Difference Frequency Generation in Phase-Locked Arrays of Quantum Cascade Lasers	$149,973	Active Phase I
OptiGrate Corp.	Army	A15A-0030171	Solid state narrowband THz emitter	$150,000	Active Phase I
Synclesis	Army	A15A-0040079	Stochastic Electromagnetic / Circuit Analysis	$149,982	Active Phase I
EMAG Technologies, Inc.	Army	A15A-0040128	Stochastic Electromagnetic / Circuit Analysis	$149,988	Active Phase I
Lynntech, Inc.	Army	A15A-0060021	Lightweight Thermoacoustic Device Using Novel Materials for Noise Cancellation of Military Vehicles	$150,000	Active Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Structured Materials Industries	Army	A15A-0060073	Graphene-Based Thermoacoustic Materials for Noise Cancellation of Military Ground Combat Vehicles	$150,000	Active Phase I
NuMat Technologies, Inc.	Army	A15A-0140010	Scaling & Supramolecular Engineering of Metal-Organic Frameworks (MOFs)	$150,000	Active Phase I
Inmondo Tech, Inc.	Army	A15A-0140085	Scaling & Supramolecular Engineering of Metal-Organic Frameworks (MOFs)	$149,925	Active Phase I
Triton Systems Inc.	Army	A15A-0160031	Nanostructured conductive transparent coatings	N/A	Pending Phase I
Agiltron Corporation	Army	A15A-0160065	Conductive Transmissive Coating for Enhanced-Absorption Thin Film Solar Cells	N/A	Pending Phase I
Creare LLC	Army	A15A-0170089	Piezoelectric Nanofibers for Wearable Energy Harvesting	N/A	Pending Phase I
Streamline Automation, LLC	Army	A15A-0170127	Energy Harvesting Fabric	N/A	Pending Phase I
Pixelligent Technologies LLC	Army	A15A-0180039	Fuel Efficient Nanofluid Gear Oil	$150,000	Active Phase I
Applied Colloids	Army	A15A-0180101	Fuel Efficient Nanofluid Gear Oil	$149,706	Active Phase I
TPL, Inc.	Army	A151-0140319	Nanoparticle Capacitors for Multi-Point Initiation	$99,999	Active Phase I
Aegis Technology	Army	A151-0141048	Nanoparticle Capacitors for Multi-Point Initiation	$99,999	Active Phase I
Physical Sciences Inc.	Army	A151-0180200	Novel High Betavoltaic Power Source	$99,984	Active Phase I
Infinity Power LLC	Army	A151-0180600	Radiolytic Atomic Cell for Long-lived Sensors	$99,897	Active Phase I
Widetronix	Army	A151-0180975	Radioisotope Power Source for Long-Lived Sensors and Communications	$99,932	Active Phase I
AmberWave, Inc.	Army	A151-0230619	High Performance, Flexible, Silicon-Based Photovoltaic Devices	$99,999	Active Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Applied Novel Devices	Army	A151-0230987	High Performance, Flexible, Silicon-Based Photovoltaic Devices	$99,999	Active Phase I
MV Innovative Technologies LLC (DBA: Optonicus)	Army	A151-0350848	Optical Power Transmission with Adaptive Beam Shaping (OPT_ABS)	$99,913	Active Phase I
DHPC Technologies, Inc.	Army	A151-0351020	Laser-based Wireless Power Transfer	$99923	Active Phase I
Rocky Research	Army	A151-0650464	Efficient lightweight multipower modular refrigerator	$99,741	Active Phase I
TIAX LLC	Army	A151-0650528	Technologies for Modular Refrigeration	$99,972	Active Phase I
Life-E, LLC	Army	A151-0660095	Nanoxene Enabled Radiant Floor Heating Technology for Expeditionary Shelters	$99,965	Active Phase I
TIAX LLC	Army	A151-0660548	Radiant Floor Heating Technology for Expeditionary Shelters	$99,960	Active Phase I
Giner, Inc.	Army	A151-0830278	High Energy Density All-Solid-State Li-S Batteries	$99,995	Active Phase I
Lynntech, Inc.	Army	A151-0830315	Novel Solid State Lithium-Sulfur Battery Technology for Military Vehicles	$99,999	Active Phase I
GridBridge, Inc.	Army	A151-0840307	Gallium Nitride (GaN) Bi-Directional Battery Isolator Unit	$99,989	Active Phase I
Mainstream Engineering Corporation	Army	A151-0841154	4-Quadrant GaN Based Battery Isolator Unit	$99,856	Active Phase I
ThermoAnalytics, Inc.	Army	A151-0850241	In-Situ Thermal Properties Measurement Instrument	$99,774	Active Phase I
Qualtech Systems, Inc.	Army	A151-0870587	High Performance Switched Reluctance Generator Controller	$99,854	Active Phase I
Computational Sciences, LLC	Army	A2-5691	A universal framework for non-deteriorating time domain numerical algorithms in Maxwell's electrodynamics	$999,893	Completed Phase II

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
SI2 Technologies	Army	A2-5753	Printed, Flexible Ultracapacitors Based on Novel, High-Performance Carbon Nanomaterials (1000-298)	$592,574	Active Phase II
Applied Mathematics, Inc.	Army	A2-5755	Near Real-Time Quantification of Stochastic Model Parameters	$1,000,000	Completed Phase II
NextGen Aeronautics	Army	A2-5762	Embedded Self-Repairing Antenna Composite (ESAC)	$995,332	Active Phase II
QmagiQ, LLC	Army	A2-5773	VLWIR SLS Digital FPA for Hyperspectral Imaging	$528,651	Active Phase II
Staib Instruments, Inc.	Army	A2-5781	Chemical Analyzer System for In Situ and Real Time Surface Monitoring for Composition Control During Synthesis of Compound Semiconductor Films	$999,615	Active Phase II
Zetroz	Army	A2-6050	Innovative Wound Regeneration Support Approaches to Enable Rapid Treatment of Wounded Warfighters	N/A	Pending Phase II
Thermal Storage Systems, Inc.	Army	A2-4864	Self-powered Solar Water Heater	$727,048	Active CRP
TIAX LLC	Army	A2-5858	Abuse Tolerant High Energy LiCoPO4-Based 5V Li-ion Cells	$499,995	Active Phase II
Physical Optics Corporation	Army	A2-5702	Ambient Energy Conversion System	$999,912	Active Phase II
Steven Winter Associates, Inc.	Army	A2-5263	Energy Reducing, Ruggedized, Solar Lighting System	$999,999	Pending CRP
Logos Technologies, Inc.	DARPA	D133-0040032	Multi-Fueled Hybrid Motorcycle for Covert Mobility	$149,145	Completed Phase I
Modular Bionics Inc.	DARPA	D142-0060034	Extensible Hermetic Neural Interface Microsystems	$99,999	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Triangle BioSystems, Inc.	DARPA	D142-0060094	Extensible, Wireless, and Implantable Neural-interface Microsystems	$99,965	Completed Phase I
MaXentric Technologies LLC	DARPA	D143-0040118	High Performance, Integrated Transistors for On-Chip Power Supplies	$99,940	Active Phase I
MicroLeads	DARPA	D2-1367	Advanced Micro-System for Scalable Neural Recording and Stimulation	$1,485,666	Active Phase II
Ripple LLC	DARPA	D2-1374	Extensible Hermetic Neural Interface Microsystems	$998,540	Active Phase II
Logos Technologies, Inc.	DARPA	D2-1396	Multi-Fueled Hybrid Motorcycle for Covert Mobility	$1,473,121	Active Phase II
Sarda Technologies, Inc.	DARPA	D2-1409	High Performance, Integrated Transistors for On-Chip Power Supplies	$999,926	Active Phase II
Modular Bionics Inc.	DARPA	D2-1437	Roaming Animal Microsystem (RoAM)	$999,854	Active Phase II
Triangle BioSystems, Inc.	DARPA	D2-1439	Extensible, Wireless, and Implantable Neural-interface Microsystems	$1,499,972	Active Phase II
MaXentric Technologies LLC	DARPA	D2-1484	High Performance, Integrated Transistors for On-Chip Power Supplies	$999,953	Pending Phase II
Brimrose Technology Corporation	MDA	B2-2123	Light Weight Optics for High Power Directed Energy Applications	$1,000,000	Active Phase II
Solid Power Inc.	MDA	B2-2068	All Solid-State Rechargeable Batteries for Throttleable Divert and Attitude Control Systems	$1,000,000	Active Phase II
Valley Tech Systems	MDA	B2-2032	Lightweight Low Power Long Duration Attitude Control System (ACS) Thruster	$1,000,000	Active Phase II
ADA Technologies, Inc.	MDA	B2-2090	Extreme Long Life High Energy Battery	$1,000,000	Active Phase II

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Digital Solid State Propulsions, Inc.	MDA	B2-2055	Green Catalyst-free Electric Monopropellant (GEM) for Insensitive Munitions (IM)	$1,000,000	Active Phase II
Valley Tech Systems	MDA	B142-0020126	Lightweight Long Duration Warm Gas Upper Stage Rocket Motor ACS	$125,000	Closed Phase I
Ultramet	MDA	B142-0020394	Enhanced Strength, Lightweight, High Temperature Insulating Structures	$125,000	Closed Phase I
Intelligent Automation, Inc.	MDA	B142-0060448	Lightweight Approach to System Protection	$125,000	Closed Phase I
Integument Technologies, Inc.	MDA	B142-014-0119	Weight Optimized Mitigation to Direct Effects of Lightning Strike on a Missile Body	$125,000	Closed Phase I
Triton System, Inc.	MDA	B142-0140220	Lightweight Lightning Protection System for Missiles	$125,000	Closed Phase I
San Diego Composites, Inc.	MDA	B142-0140422	Weight Optimized Mitigation to Direct Effects of Lightning Strike on a Missile Body Using Filament	$125,000	Closed Phase I
Utron Kinetics, LLC	MDA	B142-0200149	Advanced Lightweight Insulator Composite Materials Development and Fabrication	$125,000	Closed Phase I
Summit Materials, LLC	NAVY	N133-1470003	Near-Net Shape Lightweight Titanium Wheeled Hubs	$79,932	Completed Phase I
KaZaK Technologies, Inc.	NAVY	N133-1470087	Alternative Materials for Tactical Vehicle Wheeled Hubs	$80,000	Completed Phase I
GS Engineering, Inc.	NAVY	N133-1470107	Alternative Materials for Tactical Vehicle Wheeled Hubs	$79,581	Completed Phase I
LaunchPoint Technologies, Inc.	NAVY	N133-1480011	Adaptive Diesel Engine Control	$79,310	Completed Phase I
Electromechanical Associates	NAVY	N133-1480021	Adaptive Diesel Engine Control Via Variable Valve Timing	$149,635	Completed Phase I
Nanohmics, Inc.	NAVY	N133-1480077	Adaptive Diesel Engine Control	$79,981	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
EIC Laboratories, Inc.	NAVY	N14A-0060279	Development of a Safer Li-ion Battery for Naval Aircraft Applications Through Thermal Management Design	$750,000	Active Phase II
Cornerstone Research Group, Inc.	NAVY	N141-0010251	Exhaust Heat Capture Ration Heating System (EHC-RHS)	$80,000	Completed Phase I
Texas Research Institute Austin, Inc.	NAVY	N141-0011012	Alternative Energy Sources for Heating Rations	$149,990	Completed Phase I
Mainstream Engineering Corporation	NAVY	N141-0011090	Waste Heat Recovery for Tray Ration Heating	$79,865	Completed Phase I
Physical Optics Corporation	NAVY	N141-0210119	Turbojet Laser Ignition System	$79,999	Completed Phase I
Princeton Optronics, Inc.	NAVY	N141-0210434	Improved Reliability Laser Based Ignition System	$149,964	Completed Phase I
Nova Photonics, Inc.	NAVY	N141-0211065	Reliable Laser Ignition System for Gas Turbine Engines	$79,953	Completed Phase I
Luna Innovations Incorporated	NAVY	N141-0230656	Autonomous Hydraulic Actuator Health Monitoring System for Enhanced Condition Based Maintenance	$80,000	Completed Phase I
Navatek Ltd	NAVY	N141-0240238	Galley-Scullery Water Conservation System (GSWCS)	$79,997	Completed Phase I
Filtration Solutions, Inc.	NAVY	N141-0240602	Galley-Scullery Water Conservation System (GSWCS)	$79,997	Completed Phase I
Mainstream Engineering Corporation	NAVY	N141-0241079	Development of a Greywater Recycling System for Galley Scullery Wastewater	$79,084	Completed Phase I
Mide Technology Corporation	NAVY	N141-0290684	Submarine Health and Usage Monitoring Autonomous Networks (SUBHUMAN)	$80,000	Completed Phase I
Real-Time Innovations	NAVY	N141-0300061	Sense and Respond Technology Enabling Condition-Based	$79,970	Completed Phase I

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
			Maintenance (CBM)		
Qualtech Systems, Inc.	NAVY	N141-030-0444	Sense and Respond Technology Enabling Condition Based Maintenance (CBM)	$79,966	Completed Phase I
Harmonia Holdings Group	NAVY	N141-0300645	Information Technology Analytical Maintenance and Monitoring (IT-AMMO)	$79,977	Completed Phase I
Physical Optics Corporation	NAVY	N141-0310037	Naval Energy Advanced Control System	$79,978	Completed Phase I
Nuvotronics LLC	NAVY	N141-0340213	High-Power Phase Shifter	$79,931	Completed Phase I
MEMtronics Corporation	NAVY	N141-0340420	High-Power MEMS Phase Shifter Integrated Circuits	$79,951	Completed Phase I
Trout Green Technologies, Incorporated	NAVY	N141-0430001	Improved, Flexible Infrastructure Compatible, Open-Loop Air-Cooled Computer Rack / Cabinet	$79,996	Completed Phase I
Global Technical Systems	NAVY	N141-0430996	Improved, Flexible Infrastructure Compatible, Open- Loop Air-Cooled Computer Rack / Cabinet	$79,941	Completed Phase I
QuesTek Innovations LLC	NAVY	N141-0620417	Aluminum Alloy Development and Use in Additive Manufacturing Process Design for Drive System Gear Boxes	$149,989	Completed Phase I
Advanced Powder Solutions, Inc.	NAVY	N141-0621110	Engineered Aluminum Alloys for Additive Manufacturing	$79,959	Completed Phase I
NextGen Aeronautics	NAVY	N141-0630481	Advance Growth Methods for Aligned and Ultra-Long Carbon Nanotubes for Naval Applications	$79,974	Completed Phase I
Mainstream Engineering Corporation	NAVY	N141-0631052	Fabrication of Ultra-Long Carbon Nanotubes Through Segregated Flow Chemical Vapor Deposition	$149,923	Completed Phase I
HYPRES, Inc.	NAVY	N141-0641010	Magnesium Diboride DC and Data Cables for Digital-RF Systems	$149,768	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
BTech Acoustics LLC	NAVY	N141-0660131	Low-Profile, Broadband, Shear-Mode SONAR Transducer for Deep Submergence Applications	$80,000	Completed Phase I
Image Acoustics, Inc.	NAVY	N141-0660881	Low-Profile, Broadband, Shear-Mode SONAR Transducer for Deep Submergence Applications	$79,974	Completed Phase I
Hadal, Inc.	NAVY	N141-0660970	Low-Profile, Broadband, Shear-Mode SONAR Transducer for Deep Submergence Applications	$147,162	Completed Phase I
Advanced Cooling Technologies, Inc.	NAVY	N141-0680338	Advanced Finned-Tube Heat Exchanger with an Integrated Phase Distributor	$79,974	Completed Phase I
Creare	NAVY	N141-0680559	Low-Cost Compact Microchannel Heat Exchanger with Uniform Flow Distribution	$79,865	Completed Phase I
Optimized Thermal Systems, Inc.	NAVY	N141-0680603	Advanced Two-Phase Heat Exchangers for Environmental Control	$79,564	Completed Phase 1
Mainstream Engineering Corporation	NAVY	N141-068-1046	Low-Cost Phase-Distribution Enhancement for Two-Phase Heat Exchangers	$149,764	Completed Phase I
Electric Drivetrain Technologies LLC.	NAVY	N141-0730023	Multi-Stage, Multi-Phase, High Efficiency, Intelligent, Electrical Energy Conversion Unit for Navy and USMC	$79,974	Completed Phase I
Global Technology Connection, Inc.	NAVY	N141-0731002	Multi-Stage, Multi-Phase, High Efficiency, Intelligent, Electrical Energy Conversion Unit for Navy and USMC	$149,916	Completed Phase I
Advanced Ceramic Fibers, LLC	NAVY	N141-0740260	Robust 2700 F MC/C Fiber Reinforced Matrices for Turbine Engines	$149,950	Completed Phase I
Physical Sciences Inc.	NAVY	N141-0740574	CMC Matrices Enabling Long Operational Lifetimes at Temperatures Above 2700ºF	$79,948	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
ATA Engineering, Inc.	NAVY	N142-0870017	Rugged and Energy-Efficient Portable Oxygen Generator for Field Hospitals	$84,632	Completed Phase I
Lynntech, Inc.	NAVY	N142-0870195	Portable, Hybrid Electrochemical Oxygen Generation and Compression System	$79,999	Completed Phase I
TDA Research, Inc.	NAVY	N142-0870377	Expeditionary Portable Oxygen Generation System	$150,000	Active Phase I
ATA Engineering, Inc.	NAVY	N142-0880018	High Efficiency Insulating Barrier for Expeditionary Shelters	$154,458	Active Phase I
LGarde, Inc.	NAVY	N142-0880407	Insulating Barriers for Softwall Shelters	$79,989	Completed Phase I
Luna Innovations Incorporated	NAVY	N142-0880453	Flexible Hybrid Composite Insulation for Software Shelters	$79,999	Completed Phase 1
ADA Technologies, Inc.	NAVY	N142-0920480	High Voltage Lithium Ion Reserve Battery	$79,995	Completed Phase I
CFD Research Corporation	NAVY	N142-0920485	Novel Cathodes for High Power Thermal Battery	$79,861	Completed Phase I
Binergy Scientific	NAVY	N142-0920705	Novel nanostructure anode and cathode for advanced high energy and power thermal batteries	$79,917	Completed Phase I
Nanowise LLC	NAVY	N142-1100261	High Power, Long Endurance MnO2/CFx Battery for Sonobuoys Based on Interpenetrating Conductive Network	$79,913	Completed Phase I
Retriev Technologies, Inc.	NAVY	N142-1100315	High Power, Long Endurance Battery	$79,897	Completed Phase I
MaxPower, Inc.	NAVY	N142-1100487	High Power, Long Endurance Battery	$79,616	Completed Phase I
Bettergy Corp.	NAVY	N142-1100744	A Solid State Bipolar Battery for High Power Sonobuoy Applications	$79,987	Completed Phase I
Seatrec, Inc.	NAVY	N142-1160086	Design, Development, and Test of Ocean Energy Harvesting Systems	$79,858	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Advanced Cooling Technologies, Inc.	NAVY	N142-1160190	PCM-Based Ocean Thermal Energy Harvesting System	$79,997	Completed Phase I
Maritime Applied Physics Corporation	NAVY	N142-1160587	Affordable, Scalable, Ocean Energy Harvesting System	$79,477	Completed Phase I
Makai Ocean Engineering, Inc.	NAVY	N142-1170327	Components for a Deep Drifting Sonobuoy	$80,000	Completed Phase I
SeaLandAire Technologies, Inc.	NAVY	N142-1170716	Components for a Deep Drifting Sonobuoy	$79,960	Completed Phase I
PolyPlus Battery Company	NAVY	N142-1170856	Components for a Deep Drifting Sonobuoy	$79,617	Completed Phase I
Sonalysts, Inc.	NAVY	N142-1210191	Extended Range Forecasting and Advanced Climate Applications Decision Support System	$80,000	Completed Phase I
Clear Science, Inc.	NAVY	N142-1210281	Extended Range Forecasting and Advanced Climate Applications Decision Support System	$72,610	Completed Phase I
Charles River Analytics Inc.	NAVY	N142-1210326	Climatological Observations for Maritime Prediction and Analysis Support Service (COMPASS)	$79,891	Completed Phase I
AgileSrc LLC	NAVY	N142-1210508	Extended Range Forecasting and Advanced Climate Applications Decision Support System	$79,954	Completed Phase I
TRS Ceramics, Inc.	NAVY	N142-1230050	Advanced Ceramic High Speed and High Voltage Capacitors	$79,999	Completed Phase I
Ballistic Devices Inc.	NAVY	N142-1230541	High Speed and High Voltage Capacitors for Naval HPRF Directed Energy Applications	$79,232	Completed Phase I
PolyK Technologies, LLC	NAVY	N142-1230584	High Speed and High Voltage Capacitors for Naval HPRF Directed Energy Applications	$80,000	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
NanoSonic, Inc.	NAVY	N14A-0030249	High-Efficiency, High-Power Density III-V Multijunction Solar Cells on Si and Hybridsil®	$80,000	Completed Phase I
William P. Peschel, Engineering Consultants	NAVY	N14A-0040028	Technologies for the Suppression of Combustion Instability or Screech	$79,944	Completed Phase I
Physics, Materials & Applied Math Research	NAVY	N14A-0040202	Active Combustion Control of Augmentor Dynamics using Robust High-Frequency Energy Deposition	$79,999	Completed Phase I
Combustion Research and Flow Technology,	NAVY	N14A-0050012	Design Optimization and Analysis of Advanced Exhaust Systems	$79,998	Completed Phase I
Cascade Technologies Incorporated	NAVY	N14A-0050178	Design Optimization and Analysis of Advanced Exhaust Systems	$80,000	Completed Phase I
Yardney Technical Products, Inc.	NAVY	N14A-0060093	Development of Safe, Reliable, and Durable Lithium-ion Battery for Naval Aircraft Applications	$79,754	Completed Phase I
Texas Research Institute Austin, Inc.	NAVY	N14A-0060272	Development of a Safer Lithium-ion (Li-ion) Battery for Naval Aircraft Applications Through Thermal Management Design	$80,000	Completed Phase I
Episensors, Inc.	NAVY	N14A-0070320	More Efficient GaN - SiGe based MMICs for Communication and Radar Systems	$79,999	Completed Phase I
Ultraconduct LLC	NAVY	N14A-0170233	Ultra-strong and Ultrahigh Conductive Metal/CNT Composites by Electrochemical CoDeposition and Processing	$80,000	Completed Phase I
RadiaBeam Technologies, LLC	NAVY	N14A-0180348	Compact Megavolt Switch Utilizing Novel Switching Mediums	$79,690	Completed Phase I
Sciperio, Inc.	NAVY	N14A-0210021	Affordable 3D Printed Phased Arrays	$79,995	Completed Phase I
Optomec Design Company	NAVY	N14A-0210246	Affordable 3D Printed Phased Arrays	$79,969	Completed Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Altex Technologies Corporation	NAVY	N151-0010791	Improved Softwall Shelter Heating System	$79,994	Active Phase I
Aerophase	NAVY	N151-0010839	Portable Multi-Fuel Shelter Heater	$79,308	Active Phase I
BlazeTech Corp.	NAVY	N151-0011007	Improved Softwall Shelter Heating System	$80,000	Active Phase I
Davis Technologies Intl., Inc.	NAVY	N151-0030128	Low Complexity Suspension System for Amphibious Vehicles	$79,177	Active Phase I
Loc Performance Products, Inc.	NAVY	N151-0030488	Best Value Suspension System	$79,964	Active Phase I
Great Lakes Sound & Vibration, Inc.	NAVY	N151-0040167	Compact Auxiliary Power System for Amphibious Combat Vehicle	$79,930	Active Phase I
Cornerstone Research Group, Inc.	NAVY	N151-0040561	Hybrid Electric Auxiliary Power System for Amphibious Combat Vehicle	$80,000	Active Phase I
Busek Co. Inc.	NAVY	N151-0040872	Compact Auxiliary Diesel Generator Enhanced with Electronic Fuel Injection	$79,983	Active Phase I
Diversified Technologies, Inc.	NAVY	N151-0160327	Direct Replacement Ignition Upgrade for Present and Future Combustors and Augmentors	$79,683	Active Phase I
Creare LLC	NAVY	N151-0160579	Design Tools for Implementing Advanced Augmentor Ignition Systems	$79,959	Active Phase I
Knite Inc.	NAVY	N151-0160831	Direct Replacement Ignition Upgrade for Present and Future Combustors and Augmentors	$79,977	Active Phase I
KCF Technologies, Inc.	NAVY	N151-0270351	Advanced Submarine Condition Monitoring	$84,989	Active Phase I
Luna Innovations Incorporated	NAVY	N151-0270641	Processes for Condition Monitoring and Prognostics at the Sensor Node	$80,000	Completed Phase I

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
PneumatiCoat Technologies	NAVY	N151-0480331	Long Life, Highly Efficient All-Solid-State Batteries for Sensor Systems	$80,000	Active Phase I
CFD Research Corporation	NAVY	N151-0480429	A High Capacity Solid State Battery for Wireless Sensor Applications	$79,912	Active Phase I
Physical Sciences Inc.	NAVY	N151-0480504	High Energy, Long Life Cells for On-Board Sensors	$79,919	Active Phase I
MTECH LABORATORIES LLC	NAVY	N151-0650384	Innovative Power Electronic Switch for Naval Applications in Extreme Temperatures	$80,000	Active Phase I
Arkansas Power Electronics International, Inc.	NAVY	N151-0650766	A Modular High Voltage (> 10 kV), High Power Density SiC Power Package for Extreme Environments	$79,971	Active Phase I
Mainstream Engineering Corporation	NAVY	N151-0651085	Extreme Temperature, Low Loss Custom Power Switch	$79,960	Active Phase I
Boston Engineering Corporation	NAVY	N151-0660292	BI-FLEX: Soft Elastomeric Technology for Rapidly Deployable Manipulation Capability	$79,997	Active Phase I
RE2, Inc.	NAVY	N151-0660505	Underwater Dual Manipulator – Inflatable (UDMI)	$79,993	Active Phase I
Other Lab Inc.	NAVY	N151-0660517	Soft Elastomeric Manipulators for Underwater Vehicles	$79,960	Active Phase I
Physical Sciences Inc.	NAVY	N151-0680556	Novel Electrical Power Generation Technology for Hypersonic Flight Vehicles	$79,191	Active Phase I
eM-TECH, Inc.	NAVY	N151-0680800	Ultra-High Temperature Thermoelectrics	$79,997	Active Phase I
Directed Vapor Technologies International, Inc.	NAVY	N151-0700920	Development of Marinized Protective Coatings for Higher Temperature Operations of Marine Gas Turbine Engines	$79,891	Active Phase I
IBC Materials & Technologies	NAVY	N151-0701071	Enhanced Oxide Layer Formation through Plasma Electrolytic Diffusion Processing of Hot Section Components	$79,714	Active Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
K2 Energy Solutions, Inc.	NAVY	N151-0730229	Enhanced Cell Designs for Improved Internal Heat Transfer for High Rate and Power Capable, Large-Format Batteries	$79,626	Active Phase I
InvenTek Corporation	NAVY	N151-073-0512	Enhanced Cell Designs for Improved Internal Heat Transfer for High Rate and Power Capable, Large-Format Batteries	$80,000	Active Phase I
Mainstream Engineering Corporation	NAVY	N151-0731099	Ultra-High Internal Battery Heat Transfer	$79,975	Active Phase I
Art Anderson Associates	NAVY	N151-0750145	Technology for Ship to Shore Connector Concepts with Combined High Speed and Payload Fraction	$80,000	Active Phase I
Navatek Ltd.	NAVY	N151-0750534	Technology for Ship to Shore Connector Concepts with Combined High Speed and Payload Fraction	$79,289	Active Phase I
Ablaze Development Corp.	NAVY	N151-0751001	Technology for Ship to Shore Connector Concepts with Combined High Speed and Payload Fraction	$79839	Active Phase I
Tridentis, LLC	NAVY	N151-0751095	Landing Craft Utility - Surface Effect Ship	$79,993	Active Phase I
Sentient Corporation	NAVY	N152-1090462	Reliability Centered Additive Manufacturing Design Framework	N/A	Pending Phase I
Weidlinger Associates, Inc.	NAVY	N152-1090608	Reliability Centered Additive Manufacturing Design Framework	N/A	Pending Phase I
Analatom Incorporated	NAVY	N152-1090762	Reliability Centered Additive Manufacturing Design Framework	N/A	Pending Phase I
QuinStar Technology, Inc.	NAVY	N152-1140033	W-band GaN IMPATT Devices	N/A	Pending Phase I
White Light Power Inc.	NAVY	N152-1140243	GaN Avalanche Devices for RF Power Generation	N/A	Pending Phase I

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Space Information Laboratories, LLC	NAVY	N15A-0010005	Robust Mission and Safety Critical Li-Ion BMS for Aerospace Applications	$79,994	Active Phase I
Invocon, Inc.	NAVY	N15A-0010025	Reliable, Safe, Lithiumion Battery Enabled by a Robust Battery Management System	$79,988	Active Phase I
Creare LLC	NAVY	N15A-0010088	Fail Safe Battery Management System for Aircraft Lithium-Ion Batteries	$79,879	Active Phase I
Progeny Systems Corporation	NAVY	N15A-0010109	Flight-Certified Lithiumion Battery	$79,744	Active Phase I
Texas Research Institute Austin, Inc.	NAVY	N15A-0010123	Reliable, Safe, Lithiumion Battery Enabled by a Robust Battery Management System	$80,000	Active Phase 1
Computational Sciences, LLC	NAVY	N15A-0020045	Improved Turbulence Modelling Across Disparate Length Scales for Naval Computational Fluid Dynamics Applications	$84,779	Active Phase I
Combustion Research and Flow Technology, Inc.	NAVY	N15A-0020064	Improved Turbulence Modelling Across Disparate Length Scales for Naval Computational Fluid Dynamics Applications	$79,999	Active Phase I
Continuum Dynamics, Inc.	NAVY	N15A-0020130	Advanced Wake Turbulence Modelling for Naval CFD Applications	$79,820	Active Phase I
Kord Technologies, Inc.	NAVY	N15A-0020190	Grid-Spacing-Independent and Discretization-Order-Independent Simulation for Naval Single-Phase and Two-Phase Flow Applications	$79,840	Active Phase I
Boston Engineering Corporation	NAVY	N15A-0120044	Naval Special Warfare (NSW) Diver Thermal Human Interface	$79,995	Active Phase I
Welkins, LLC	NAVY	N15A-0120126	Naval Special Warfare (NSW) Diver Thermal Human Interface	$79,991	Active Phase I
Advanced Conductor Technologies LLC	NAVY	N15A-0160042	Hybrid High Ampacity Electric Power Cable	$80,000	Active Phase I

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Tai-Yang Research Company	NAVY	N15A-0160131	Novel Approach to Hybrid High-Temperature Superconducting Cable	$79,998	Active Phase I
Innovative Scientific Solutions, Inc.	NAVY	N15A-0210043	Time-resolved Measurements of Temperature and Product Mass Fractions within Detonation-based Combustion Devices at Elevated Pressures and Temperatures	$79,969	Active Phase I
Spectral Energies, LLC	NAVY	N15A-0210081	Absorption Spectroscopy System for Measurements of H2O, CO2 and CO Temperatures and Concentrations in Rotating-Detonation-Engines at 800 kHz	$79,940	Active Phase I
Southwest Sciences, Inc.	NAVY	N15A-0210124	Ultrafast Multispecies Gas Sensor for Combusting Flows	$80,000	Active Phase I
Radiation Detection Technologies, Inc.	NAVY	N15A-0230016	Advanced Silicon Diode Switch for HPRF Systems	$79,994	Active Phase I
Applied Physical Electronics, L.C.	NAVY	N15A-0230146	Advanced Solid State Switch (Diode) Materials for High Rep Rate Pulse Power Systems and High Power Radio Frequency (HPRF) Applications	$79,999	Active Phase I
Kyma Technologies, Inc.	NAVY	N15A-0230196	GaN for High Rep Rate Pulsed Power	$80,000	Active Phase I
Eagle Harbor Technologies, Inc.	NAVY	N2-4880	A Variable Pulse Width, Voltage, and Repetition Frequency IGBT-based High Power Radio Frequency Source Driver	$500,984	Active Phase II
American Superconductor	NAVY	N2-4896	Compact, Lossless, Ruggedized, Electromagnetically Shielded Connectors for Power and Signals	$501,859	Active Phase II

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
D&P LLC	NAVY	N2-4920	Multiscale Lagrangian Eulerian Algorithm for Determining the Vorticity Confinement Term for Rotorcraft Computational Fluid Dynamics (CFD) Computations	$999,946	Active Phase II
Anchor Technology Inc.	NAVY	N2-4974	Automated Method for Developing Concept Level Fluid Distribution Systems	$999,992	Active Phase II
Nanohmics, Inc.	NAVY	N2-4988	Adaptive Diesel Engine Control	$499,986	Active Phase II
Electromechanical Associates	NAVY	N2-4991	Adaptive Diesel Engine Control Via Variable Valve Timing	$735,708	Active Phase II
Mainstream Engineering Corporation	NAVY	N2-5008	Low-Cost Phase-Distribution Enhancement for Two-Phase Heat Exchangers	$490,832	Active Phase II
Global Technology Connection, Inc.	NAVY	N2-5020	Multi-Stage, Multi-Phase, High Efficiency, Intelligent, Electrical Energy Conversion Unit for Navy and USMC	$499,520	Active Phase II
Princeton Optronics, Inc.	NAVY	N2-5038	Improved Reliability Laser Based Ignition System	$749,470	Active Phase II
QuesTek Innovations LLC	NAVY	N2-5041	Computational Design of Aluminum Alloys for Use in Additive Manufacturing	$547,454	Active Phase II
Nuvotronics	NAVY	N2-5123	Monolithic Microwave Integrated Circuit (MMIC) Compatible Phase Shifters for Phased-Array Radars	N/A	Pending Phase II
Qualtech Systems, Inc.	NAVY	N2-5180	Sense and Respond Technology Enabling Condition Based Maintenance (CBM)	N/A	Pending Phase II
Creare LLC	NAVY	N2-5233	A Multi-Tiered Lithium Ion Battery Thermal Fault Mitigation Architecture	$749,935	Active Phase II
SI2 Technologies, Inc.	NAVY	N2-5234	Novel, Low-Cost Phased Arrays Manufactured by 3D Printing (1000-325)	N/A	Pending Phase II

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
RDRTec Inc.	NAVY	N2-5246	More Efficient GaN - SiGe based MMICs for Communication and Radar Systems	N/A	Pending Phase II
EIC Laboratories, Inc.	NAVY	N2-5271	Development of a Safer Lithium-ion (Li-ion) Battery for Naval Aircraft Applications Through Thermal Management Design	$749,926	Active Phase II
International Electronic Machines	NAVY	N2-5281	Wireless Hydraulic Actuator Monitor (WHAM) Phase II	N/A	Pending Phase II
Bettergy Corp.	NAVY	N2-5287	A Solid State Bipolar Battery for High Power Sonobuoy Applications	N/A	Pending Phase II
Advanced Cooling Technologies, Inc.	NAVY	N2-5288	Affordable, Scalable, Ocean Energy Harvesting System	N/A	Pending Phase II
Agiltron Corporation	NAVY	N2-5340	Light-Weight Solar Cells with High Specific Power and Conversion Efficiency	N/A	Pending Phase II
TRS Ceramics, Inc.	NAVY	N2-5345	High Speed and High Voltage Capacitors for Naval HPRF Directed Energy Applications	N/A	Pending Phase II
Ballistic Devices Inc.	NAVY	N2-5350	High Speed and High Voltage Capacitors for Naval HPRF Directed Energy Applications	N/A	Pending Phase II
MicroLink Devices	NAVY	N2-5351	Light-Weight, Solar Cells with High Specific Power and Conversion Efficiency	N/A	Pending Phase II
Clear Science, Inc.	NAVY	N2-5356	Extended Range Forecasting and Advanced Climate Applications Decision Support System	N/A	Pending Phase II
Knite Inc.	NAVY	N2-5369	Active Combustion Control (ACC) of Augmentor Dynamics	N/A	Pending Phase II

Energy Independence and Security Act of 2007

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
PolyPlus Battery Company	NAVY	N2-5371	Lithium-Seawater Battery Development for a Deep Drifting Passive Sonobuoy System	N/A	Pending Phase II
ASR Corporation	NAVY	N2-5391	Compact Megavolt Switch Utilizing Novel Switching Mediums	N/A	Pending Phase II
Redox Power Systems, LLC	OSD	O133-EP42012	Ultra-High Power Density Solid Oxide Fuel Cell Stack for High Efficiency Propulsion and Power Systems	$149,048	Completed Phase I
NexTech Materials, Ltd.	OSD	O133-EP42077	Ultra-High Power Density Solid Oxide Fuel Cell Stack for High Efficiency Propulsion and Power Systems	$150,000	Completed Phase I
Materials & Electrochemical Research (MER)	OSD	O133-EP42222	Ultra-High Power Density Metal Supported SOFC Stack for High Efficiency Propulsion and Power Systems	$149,999	Completed Phase I
Naeim Henein	OSD	O133-EP52051	Precision In-Cylinder Pressure Sensor System for Heavy Duty Diesel Engines	$98,367	Completed Phase I
Optrand Incorporated	OSD	O133-EP52211	Miniature Static-Dynamic Cylinder Pressure Sensor	$143,502	Completed Phase I
Advanced Cooling Technologies, Inc.	OSD	O2-1528	Environmental Control Unit with Integrated Thermal Storage	$999,758	Active Phase II
MicroLink Devices	OSD	O2-1529	Increasing the Specific Power of Epitaxial Lift-Off Solar Cells for Cost-Effective, High-Efficiency, Flexible Photovoltaics	$1,000,000	Active Phase II
APECOR	OSD	O2-1530	High Efficiency Electric Power Manager for Man-Portable Photovoltaic Systems	$999,434	Active Phase II
NexTech Materials, Ltd.	OSD	O2-1546	High Power Density SOFC Stack	$996,114	Active Phase II

Firm Name	Component	Proposal Number	Proposal Title	Award Amount	Project Status
Cornerstone Research Group, Inc.	SOCOM	S141-0010016	TALOS Hybrid Electric Power Unit	$150,000	Completed Phase I
Physical Optics Corporation	SOCOM	S141-0010019	Research Enabled Activity Consolidated to Optimize Resources	$149,971	Completed Phase I
Solid Power, LLC	SOCOM	S141-0010083	Solid-State Battery for the Tactical Assault Light Operator Suit	$149,985	Completed Phase I
Physical Optics Corporation	SOCOM	S141-0040008	Thermal Hydrogen Extraction on Board	$149,964	Completed Phase 1
Advanced Cooling Technologies, Inc.	SOCOM	S141-0040034	Highly Efficient, Compact Hydrogen Generator for use in Marine Diesel Engines	$149,953	Completed Phase I
Lynntech, Inc.	SOCOM	S141-0040035	Advanced Hydrogen Evolution Catalysis based PEM Electrolyzers for Improved Efficiency and Reduced Emissions of Combatant Craft Diesel Engines	$150,000	Completed Phase I
Cornerstone Research Group, Inc.	SOCOM	S2-0235	TALOS Hybrid Electric Power Unit	$1,495,208	Active Phase II

Procedures and mechanisms DOD used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

DOD employs a multitude of procedures and mechanisms to give priority to energy-related projects. Components include Energy and Power Technology focus areas, as well as, Power and Directed Energy focus areas as part of SBIR/STTR solicitations. Further, DON SBIR/STTR updated their 'Energy Targets' section of the Navy Topic Review website for Topic Authors, identifying all five DON energy targets and clearly defining three categories of technical approach to these targets and improve topic tracking. Many components use energy independence as a 'tie breaker' in the selection process. Finally, DON SBIR/STTR promoted

small business attendance at the 2015 ONR Naval Future Forces EXPO focused on energy technology firms, as the majority of DON SBIR/STTR energy topics derive from ONR projects and it is critical that small firms meet principals in DOD's innovative technology Communities of Interest.

Specific actions DOD has taken to promote and support energy efficiency and renewable energy research projects

DOD SBIR/STTR participating components promote energy efficiency and renewable energy projects through information sharing and networking via component specific websites. These websites bring together the small business community, researchers, Programs of Record, and prime contractors for possible collaboration new and ongoing SBIR/STTR projects. Another successful method for promoting energy efficiency and renewable energy projects is through collaboration with various stakeholders. These groups provide unique insights into alternative fuels, energy efficiency, and power generation as they relate to reducing logistic requirements and meeting Army and DOD goals.

DOD Components also track and report SBIR/STTR success stories through these same websites, as well as brochures like the Army Commercialization Brochure. These brochures are an excellent opportunity for organizations and Small Businesses to share information about their SBIR/STTR projects and the success of their projects. These brochures are typically distributed at conferences providing exposure to these exceptional SBIR/STTR projects.

Additional component specific examples of actions taken toward promoting and supporting energy efficiency and renewable energy are found below:

a. DARPA recently continues to use the Materials for Transduction (MATRIX) program to develop new transductional materials, reducing significant size, weight, and power (SWAP) for military devices and systems. MATRIX takes a systems approach that integrates state-of-the-art materials science, predictive modeling methods, and domain-specific expertise to rapidly validate and optimize new functional architectures that offer transformative defense-related capabilities. Potential applications include:
    1. Thermoelectrics – Energy transfer, thermal management, and refrigeration
    2. Multiferroics – Enhanced sensors, actuation, micro-power generation, tunable RF and microwave field engineering

3. Phase-Change Materials – Fast switching and sensor application

b. MDA SBIR STTR continues to explore new ways for promoting and facilitating energy efficiency and renewable energy products. Current efforts include Technology Interchange Meetings, Industry Days, and Business Workshops for Phase I and Phase II contract selections. These options will likely include drawing on a broad range of business and technology subject matter experts.

Department of Education (ED)

Examples of ED SBIR/STTR projects related to energy efficiency or renewable energy

The ED SBIR Program uses a contracts mechanism to provide up to $1,050,000 in funding ($150,000 for Phase I; $900,000 for Phase II) to small business firms and partners for the research and development (R&D) of commercially viable education technology products for use by students and teachers in education and in special education settings.

At ED SBIR in FY2015, the program topic areas permitted proposals for the development of products to promote student learning and teacher instruction in areas of STEM, which includes energy efficiency and renewable energy. In FY2015, several proposals focused on science projects related to energy efficiency and renewable energy.

Within the ED SBIR portfolio, examples of projects directly focusing on student learning in the area of energy efficiency and renewable energy systems are as follows:

With a 2015 Phase II award, Strange Loop Games is developing Eco, a multi-player game to teach ecology and prepare middle schools students to be environmentally literate citizens, including learning about energy. To play the game, students enter a shared online world featuring a simulated ecosystem of plants and animals. Students co-create a civilization by measuring, modeling, and analyzing the underlying ecosystem. Students advocate for proposed plans to classmates and make decisions as a group. Cooperation and science-based decision making activities occur in order to prevent the destruction of the environment. The game includes teacher resources to support the alignment of game play to learning goals, and implementation.

As part of a 2011 Fast-Track award, Diversified Construction Services developed the STEM Solar Explorations platform. This platform is a multidisciplinary solar energy field laboratory to supplement middle school standards. The hardware component includes physical solar equipment to capture real-time data to be wirelessly transmitted to classrooms. The web-based component hosts the STEM curriculum focusing on energy concepts, a dashboard to present data, and materials to facilitate teacher training and implementation. The platform allows students to apply knowledge to daily changes in the position of the sun and to solar energy production, and to conduct hands-on investigations to address curricular content.

Procedures and mechanisms ED used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

At ED/IES SBIR in FY2015, the program topic areas permitted proposals for the development of products to promote student learning in areas of STEM, including energy efficiency and renewable energy. Several proposals focused on science projects related to energy efficiency and renewable energy. The ED SBIR program will continue to consult with SBA and the other Federal SBIR programs regarding how to best give priority to energy efficiency and renewable energy.

Specific actions ED has taken to promote and support energy efficiency and renewable energy research projects

Specific actions ED SBIR agency has taken to promote and support energy efficiency and renewable energy research projects:

1) The ED SBIR program supports energy efficiency and renewable energy within priorities and topics in solicitations.
2) The ED SBIR program promotes energy efficiency and renewable energy initiatives at conferences and meetings.
3) The ED SBIR program tracks and report success stories demonstrating the impact of the SBIR programs on energy-related projects.
4) The ED SBIR program will consider new or additional initiatives/efforts to coordinate with other programs that support energy efficiency and renewable energy.

Department of Energy (DOE)

Examples of DOE SBIR/STTR projects related to energy efficiency or renewable energy

CATALYSIS

Firm Name/Location	Project Title
Zymochem Inc.	Novel Adipic Acid Synthesis Pathway from Biomass-derived sugars and intermediates Topic/Sub
Innovatek, Inc.	Catalytic Process to Produce High Value Platform Chemicals from Biomass-Derived Lignin
KSE, Inc.	Manufacture of Acrylic Acid from Biomass Derived Intermediates
Cell-free Bioinnovation, Inc.	Production of a Zero Calorie Sweetener L-arabinose from Biomass D-Xylose by an Enzyme Cocktail
TDA Research, Inc.	A Renewable Polymer from Fast Pyrolysis of Biomass
PH Matter, LLC	Non-Precious Metal Bi-Functional Catalysts
Proton Energy Systems	Non-Platinum Group Metal OER/ORR Catalysts for Alkaline Membrane Fuel Cells and Electrolyzers

MEMBRANES AND MATERIALS FOR ENERGY EFFICIENCY

Firm Name	Project Title
Global Research & Development, Inc.	Oxygen Separation with Dual Phase Nano-Composite Membranes
Covalent	Ultra-Low Energy, Low Cost Industrial Nanomembrane Manufacturing for Desalination, Water Purification, and Remediation
Sustainable Innovations, LLC	Hydrogen Contamination Detection
Southwest Sciences, Inc.	Diode Laser Sensor for Contaminants in Hydrogen

Procedures and mechanisms DOE used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

ADVANCED MANUFACTURING

A. Wide Bandgap Semiconductors for Energy Efficiency and Renewable Energy

Adroit Materials
2054 Kildaire Farm Rd., Suite 205
Cary, NC 27518-6614
Developing Epi-Ready Gallium Nitride Wafer Surfaces

Kyma Technologies
8829 Midway West Road
Raleigh, NC 27617-4606
AlN-Based Power Electronics Device Epiwafer Manufacturing

OptiCOMP Networks, Inc.
60 Phillips St., Bldg 3 Ste 2
Attleboro, MA 02703-6129
Rapid thinning of GaN and SiC substrates for epi-ready and power devices by layer lift-off

Sinmat Inc.
1912 NW 67th Place
Gainesville, FL 32653-1649
Novel Ultra-High Rate Finishing Processes for Production of 100 mm Epi-ready GaN Substrates

SixPoint Materials, Inc
37 Industrial Way, 106
Buellton, CA 93427-9584
Development of electrolytic in-process dressing (ELID) grinding of GaN wafers sliced from bulk GaN crystals by ammonothermal growth

B. Natural Gas Feedstock and Fuel Substitution for Energy Efficient Manufacturing

Advanced Cooling Technologies, Inc.
1046 New Holland Ave.
Lancaster, PA 17601-5606
High efficiency, high temperature heat recuperation for reduced plasma energy consumption

Lynntech, Inc.
2501 Earl Rudder Freeway South
College Station, TX 77845-6023
Plasma process for production of carbon materials from natural gas

Reactive Innovations, LLC
2 Park Drive, Unit 4
Westford, MA 01886-3525
Natural Gas Micro-Channel Reactor for Producing C2 Hydrocarbons

Rivis, Inc.
8100 Brownleigh Dr., Suite 120
Raleigh, NC 27617-7300
Low cost modular plasma system for reforming of natural gas

Thermosolv LLC, Laramie, WY
3474 North 3rd Stree
Laramie, WY 82072-9571
Upgrading of crude from direct gas-to-liquid processing

C. Carbon Fiber Production Processes

TDA Research, Inc.
12345 W. 52nd Ave.
Wheat Ridge, CO 80033-1916
Low Energy Carbonization of PAN Fibers

Vuronyx Technologies
100 Cummings Center
Beverly, MA 01915-6115

Novel Carbon Fiber Synthesis Process Based on Joule Heating

D. Novel Low Cost Recovery from Low Temperature Industrial Waste Heat

Aqwest LLC
8276 Eagle Road
Larkspur, CO 80118-8224
Magnetocaloric Generator for Waste Heat Recover

ITN Energy Systems, Inc.
8130 Shaffer Parkway
Littleton, CO 80127-4107
Low-Cost, High-Efficiency Direct Energy Conversion of Infrared Radiation to Electricity with Tunable Plasmonic Structures

BIOENERGY

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

Mainstream Engineering Corporation
200 Yellow Place
Rockledge, FL 32955-5327
Process Intensification and Cost Reduction for In-plant Biomass Preprocessing Equipment

B. Low-Cost Coatings for Advanced Thermal Processes in Metal Combustors

Faraday Technology, Inc.
315 Huls Drive
Englewood, OH 45315-8983
Low-Cost Alloy Coatings by Pulsed Electrodeposition for Combustors

HiFunda LLC
421 Wakara Way Ste 300
Salt Lake City, UT 84108-3549
Low-Cost Plasma Spray Coatings for Metal Components in Biomass Conversion Systems

NanoCoatings, Inc.
525 University Loop, Suite 114

Rapid City, SD 57701-4039
Corrosion-Resistant Crystalline-Oxide Coatings on Steel Substrates by an Immersion Anodizing Process

Novoreach Technologies LLC
210 Arrow Cove
Midland, MI 48642-6950
Advanced Low-Cost Aluminized Coatings for Metal Combustors

ReliaCoat Technologies, LLC
10 Technology Drive. Unit 3
East Setauket, NY 11733-4063
Cost effective, multifunctional thermal spray coatings for protection of metal combustors

C. Solid-Liquid Separations for Algal Systems

Compact Membrane Systems, Inc.
335 Water Street
Newport, DE 19804-2410
Non-Fouling Polymeric Membrane for Algae Dewatering

Dynaflow, Inc.
10621-J Iron Bridge Road
Jessup, MD 20794-9381
High Efficiency Induced Air flotation using Hydrodynamic Cavitation to Dewater Algal Solutions

Helios-NRG, LLC
1576 Sweet Home Road
Amherst, NY 14228-2710
Novel Integrated Technology Incorporating Anti-fouling Membranes to Dewater Algal Harvests

Manta Biofuel, LLC
17 Glynn Garth
Reisterstown, MD 21136-1716
Development of a High Throughput Algal Dewatering System Using Magnetic Particles

MicroBio Engineering
PO Box 15821
San Luis Obispo, CA 93406-5821
Algal Bioflocculation for Solid-Liquid Separation

Techverse, Inc.
124 Goldenthal Court
Cary, NC 27519-7368
Advanced, Low-Cost, System for Algae Dewatering

BUILDINGS

A. Energy Efficient Solid-State Lighting Luminaires, Products, and Systems

Rebound Technology LLC
74 Benthaven Place
Boulder, CO 80305-6255
Switchable Polarity Freeze Suppression for Distributed Thermal Energy Storage

FUEL CELLS

A. Fuel Cell-Battery Electric Hybrid for Utility or Municipal MD or HD Bucket Trucks

US Hybrid Corporation
445 Maple Avenue
Torrance, CA 90503-3807
Fuel Cell-Battery Electric Hybrid for Utility or Municipal MD or HD Bucket Trucks (H2BT)

B. TECHNOLOGY TRANSFER OPPORTUNITY: In-line Quality Control Devices Applicable to PEM

Fuel Cell MEA Materials
Mainstream Engineering Corporation
200 Yellow Place
Rockledge, FL 32955-5327
Cross-polarized Near-UV Detector for In-line Quality Control of PEM Materials

GEOTHERMAL

A. Innovative Products or Technologies that Develop New Markets/Revenue Streams for Geothermal Energy

Aerodyne Research, Inc.
45 Manning Road
Billerica, MA 01821-3976
Utilizing Geothermal Heat for Hydrothermal Liquefaction of Algae

Arkansas Power Electronics International, Inc.
535 W. Research Center Blvd.

Fayetteville, AR 72701-6959
A 300°C Power Module Using Wide Bandgap Devices, Advanced Materials/Processes, and High Temperature Integrated Circuits for Geothermal Applications

Karamalidis Extraction Technologies
5516 Wilkins Avenue
Pittsburgh, PA 15217-1210
Ion Imprinted Polymers for the Extraction and Recovery of Rare Earth Elements from Geothermal Fluids

SOLAR

B. Analytical and Numerical Modeling and Data Aggregation

ClearGrid Innovations
60 Robertson Avenue
White Plains, NY 10606-1308
Innovative Approaches to Solar Lead Generation Using Novel Datasets

Enduring Energy, LLC
5589 Arapahoe Ave, Suite 203
Boulder, CO 80303-8115
Solar Retina: Crowd-Sourcing "Behind-the-Meter" Solar PV Data

Vertum Partners LP
617 S Olive St STE 400
Los Angeles, CA 90014-1644
Integrated Predictive Systems for Solar Energy with Modeling Post Processing and Machine Learning

C. Analytical and Numerical Modeling and Data Aggregation

Trevi Systems Inc
1 Willowbrook Court Suite 200
Petaluma, CA 94954-6507
Desalination Driven by Steam-Generating Concentrating Solar Collector

VEHICLES

A. Electric Drive Vehicle Batteries

American Lithium Energy Corporation
1485 Poinsettia Avenue STE 118
Vista, CA 92081
Developing Robust All-Solid-State Li Battery with a Ceramic Electrolyte and Interfacially Engineered Lithium Metal Anode

Ballast Energy, Inc.
816 Bancroft Way Suite A
Berkeley, CA 94710-2227
High Loading Lithium-Ion Electrode Architecture for Low Cost Electric Vehicle Batteries

Bettergy Corp.
8 John Walsh Blvd., Suite 321
Peekskill, NY 10566-5330
Advanced Lithium-Sulfur Battery for Electric Vehicle Applications

HICO Tech
2344 Autumnwood Dr.
State College, PA 16801-2460
Development of Long Cycle Life Li-ion Hybrid Batteries with High Energy and Power Densities for Micro-hybrid Vehicles

Novarials Corporation
62 Musket Drive
Nashua, NH 03062-1441
A High Performance Battery Separator

PH Matter, LLC
1275 Kinnear Rd.
Columbus, OH 43212-1155
Components for Improved-Performance EV Batteries

SiILion, LLC
3101 Gamow Ln

Boulder, CO 80301-5465
Ionic Liquid Enabled High-Energy Li-ion Battery

Tiax, LLC
35 Hartwell Avenue
Lexington, MA 02421-3102
Low-cost, high-performance battery for start-stop applications

B. SiC Schottky Diodes for Electric Drive Vehicle Power Electronics

GeneSiC Semiconductor Inc
43670 Trade Center Place, Suite 155
Dulles, VA 20166-2123
900 V/200 A SiC Schottky Diode fabrication on 150 mm substrates in a high-volume Si foundry for automotive traction inverters

Monolith Semiconductor, Inc.
1000 Heritage Center Circle
Round Rock, TX 78664-4463
Development of 600V, 100A SiC Schottky Diodes in a 150mm Si Foundry for Electric Vehicle Traction

Inverter Applications
United Silicon Carbide, Inc.
7 Deer Park Drive, Suite E
Monmouth Junction, NJ 08852-1921
High Current SiC Schottky Diodes for Electric Drive Vehicle Power Electronics

C. Onboard Fuel Separator or Reformer

Filter Sensing Technologies, Inc.
38 2nd Street
Cambridge, MA 02141-1753
High Efficiency SI Engines by Generation of Multiple Fuels from Gasoline Precision

Combustion, Inc.
410 Sackett Point Road
North Haven, CT 06473-3106

Onboard implementation of an ultra-compact hydrogen-generator for efficiency and emissions benefits in IC engines

E. Onboard Fuel Separator or Reformer

ARC Technology, LLC
13076 NW 120th Street
Whitewater, KS 67154-9091
ICE Ignition Using Transient Plasma Acceleration

Combined Technology Solutions
2 North Maple Ave.
Ridgely, MD 21660-0887
Dynamic Spark Ignition Enables Ultra Lean Burn Combustion

Transient Plasma Systems
1751 Torrance Blvd., Unit K
Torrance, CA 90501-1726
Advanced Ignition System for Internal Combustion Engines Enabling Lean-Burn and Dilute Gasoline Ignition

WATER

A. Innovative Small, Low-head Hydropower Turbines

Cadens, LLC
W1860 Main Street
Sullivan, WI 53178-9616
Turbine Builder Hydropower Technology

B. Prognostic and Health Monitoring of MHK Devices

Frontier Technology, Inc.
75 Aero Camino, Suite A
Goleta, CA 93117-3134
Prognostic and Health Management Technology for MHK Devices (MHKPHM)

Luna Innovations Incorporated
1 Riverside Circle, Suite 400
Roanoke, VA 24016-4962
Autonomous MHK Monitoring System for Intelligent Converter Health Management

RMCI, Inc.
1525 Perimeter Pkwy NW, Suite 250
Huntsville, AL 35806-3581
Health Management for Marine Power

WIND

C. Active Load Alleviation Strategies for Wind Turbine Blades

Continuum Dynamics, Inc.
34 Lexington Avenue
Ewing, NJ 08618-2302
Distributed Low Power On-Blade Control for Wind Turbine Load Mitigation

Frontier Wind
535 Menlo Drive, Suite B
Rocklin, CA 95765-6300
Micro tab-based Active Load Alleviation System Design and Testing

Wetzel Engineering, Inc.
821 Grand Avenue Parkway, Suite 410
Pflugerville, TX 78660-2197
An Autonomous System for On-Blade Flow Control for Load Alleviation

Specific actions DOE has taken to promote and support energy efficiency and renewable energy research projects

The following topic areas address energy related topics that the DOE supported in FY2015. 11 ADVANCED MANUFACTURING

11a Wide Bandgap Semiconductors for Energy Efficiency and Renewable Energy

11b Natural Gas Feedstock and Fuel Substitution for Energy Efficient Manufacturing

11c Carbon Fiber Production Processes

11d Novel Low Cost Recovery from Low Temperature Industrial Waste Heat

12 BIOENERGY

12a Design and Fabrication of Solids Handling for Biomass Conversion Systems

12b Low-Cost Coatings for Advanced Thermal Processes in Metal Combustors

12c Solid-Liquid Separations for Algal Systems

13 BUILDINGS

13a Energy Efficient Solid-State Lighting Luminaires, Products, and Systems

13b Integrated Storage and Distributed Generation for Buildings

14 FUEL CELLS

14a Fuel Cell-Battery Electric Hybrid for Utility or Municipal MD or HD Bucket Trucks

14b Technology Transfer Opportunity: In-line Quality Control Devices Applicable to PEM Fuel Cell MEA Materials

15 GEOTHERMAL

15a Innovative Products or Technologies that Develop New Markets/Revenue Streams for Geothermal Energy

15b Technology Transfer Opportunity: Enabling Geothermal Co-produced Applications by Employing Electromagnetic Manipulation of Magnetizable Oil

16 SOLAR

16a Analytical and Numerical Modeling and Data Aggregation

16b Concentrating Solar Power: Novel Solar Collectors

16c Concentrating Solar Thermal Desalination

16d Grid Performance and Reliability

16e Labor Efficiencies through Hardware Innovations

17 VEHICLES

17a Electric Drive Vehicle Batteries

17b SiC Schottky Diodes for Electric Drive Vehicle Power Electronics

17c Onboard Fuel Separator or Reformer

17d Alternative Crank Mechanisms for Internal Combustion Engines Leading to Improved Energy Efficiency

17e Advanced Ignition System for Internal Combustion Engines Enabling Lean-Burn and Dilute Gasoline Ignition

18 WATER

18a Innovative Small, Low-head Hydropower Turbines

18b Prognostic and Health Monitoring of MHK Devices

19 WIND

19a Active Load Alleviation Strategies for Wind Turbine Blades

Department of Health and Human Services (HHS)

Examples of HHS SBIR/STTR projects related to energy efficiency or renewable energy

In FY 2015, there were no new awards made that relate to energy efficiency or renewable energy.

Procedures and mechanisms HHS used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

In direct response to the Independence and Security Act of 2007, HHS has in previous years developed targeted funding opportunity announcements (FOAs) focused on soliciting project ideas related to energy efficient or renewable energy systems research and development (R&D). Presently, the most recent FOAs have expired in 2012. HHS may utilize this targeted approach in future years again as appropriate to encourage participation and application submission from small businesses in this important targeted area.

Specific actions HHS has taken to promote and support energy efficiency and renewable energy research projects

In addition to releasing targeted FOAs such as mentioned above, the HHS investigator-initiated funding model lends itself to receiving applications from the small business community throughout the year under NIH's annual Omnibus grant solicitations with several standard submission due dates. Under these solicitations, small business applicants can propose projects related to energy efficiency or renewable energy systems for Phase I, Phase II and Fast-Track options under the SBIR and STTR programs within the mission of HHS.

Department of Homeland Security (DHS)

In FY2015, 120 Phase I proposals were received in response to the joint DHS SBIR Phase I solicitation. Of these, eight offerors self-identified that their proposed efforts were either related to energy efficiency or renewable energy. Six of the eight proposals were submitted in the following S&T Directorate topic areas: Privacy Protecting Analytics for the Internet of Things; and A Wearable Communications Hub Designed to Streamline and Improve First Responder Communication Capabilities. Two of the eight proposals were submitted in the following DNDO topic areas: Mass/Shielding Anomaly Passive Detector Module; and Stable Semiconductor Modules as Core Component in Pager Radiation Detectors.

Examples of DHS SBIR/STTR projects related to energy efficiency or renewable energy

S&T Directorate SBIR Program: None of the Phase I proposals that were submitted in response to the S&T Directorate's FY2015 topics that self-identified as being related to energy efficiency or renewable energy were funded in FY2015.

DNDO SBIR Program: One of the Phase I proposals that was submitted in response to DNDO's FY2015 topic entitled "Stable Semiconductor Modules as Core Component in Pager Radiation Detectors" that self-identified as being related to energy efficiency or renewable energy was funded in FY2015. The Phase I contract was awarded to Solid State Detection Devices, LLC (Watervliet, NY) for their proposal entitled "Next Generation Scalable Solid State Thermal Neutron Detector."

Procedures and mechanisms DHS used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

S&T Directorate SBIR Program: None, as the six proposals that self-identified as being related to energy efficiency and/or renewable energy were recommended for funding. It should be noted that the mission of the Homeland Security Advanced Research Projects Agency (HSARPA) within the S&T Directorate is to focus on identifying, developing, and transitioning technologies and capabilities to counter chemical, biological, explosive, and cyber terrorist threats, as well as protecting our nation's borders and infrastructure. Similarly, the Directorate's

First Responder Group (FRG) has a mission to strengthen the response community's abilities to protect the homeland and respond to disasters. Program managers within HSARPA and FRG develop topics in support of their missions and stakeholders. When appropriate, topic descriptions from HSARPA and FRG address energy efficiency and/or renewable energy as they relate to their specific missions. When appropriate during the funding decision process, proposals providing solutions involving energy efficiency and/or renewable energy may be used as a tie-breaker.

DNDO SBIR Program: None. The DNDO projects are related to detection. However, low-power solutions are sought if viable for deployment.

Specific actions DHS has taken to promote and support energy efficiency and renewable energy research projects

S&T Directorate SBIR Program: The mission of the Homeland Security Advanced Research Projects Agency (HSARPA) within the S&T Directorate is to focus on identifying, developing, and transitioning technologies and capabilities to counter chemical, biological, explosive, and cyber terrorist threats, as well as protecting our nation's borders and infrastructure. In addition, the Directorate’s First Responder Group (FRG) has a mission to strengthen the response community's abilities to protect the homeland and respond to disasters. Program managers within HSARPA and FRG develop topics in support of their missions and stakeholders. When appropriate, topic descriptions address energy efficiency and renewable energy as they relate to the DHS mission.

DNDO SBIR Program: None. The DNDO projects are related to detection. However, low-power solutions are sought if viable for deployment.

Department of Transportation (DOT)

Examples of DOT SBIR/STTR projects related to energy efficiency or renewable energy

DOT's 14.2 Solicitation contained a topic sponsored by the Office of the Secretary of Transportation – Research (OST-R) for "Using Alternative Energy to Reduce Greenhouse Gas Production in the Transportation Sector." Two projects were selected focused on: (1) Environmentally Neutral Energy Reclamation Electric Bike System (EnergE-Bike System) and (2) Super Ultra-Low Emission Biodiesel-Electric Hybrid Motorcycle.

Additionally, a Federal Highway Administration (FHWA) 2009 Phase I project entitled Self-Sustaining Intelligent Pavement Systems was awarded a Phase II to Solar Roadways in FY2011. The Phase II was completed in early FY2015 and a Phase IIB was awarded in November 2015. Solar Roadways continues to develop technology that covers asphalt and concrete surfaces with Solar Panels that generate electricity and reduce the use of fossil fuels.

Procedures and mechanisms DOT used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

The DOT SBIR Program Office includes a statement in each call for topics that encourages topic authors to give high priority to energy efficiency or renewable energy system research and development projects.

Specific actions DOT has taken to promote and support energy efficiency and renewable energy research projects

DOT will encourage all Operating Administrations to employ "related to energy and renewable energy" as an added consideration in award selection, i.e. as a possible tie breaker. Per SBA's guidance this procedure allows the programs to apply the additional preference without compromising the quality standards or central criteria of the program.

Environmental Protection Agency (EPA)

Examples of EPA SBIR/STTR projects related to energy efficiency or renewable energy

In FY 2015, EPA awarded 19 new SBIR Phase I awards and 8 new Phase II awards. Eight Phase I awards and three Phase II awards are energy efficiency and renewable energy related awards under P.L. 110-140. These awards (listed below) are for technologies that improve energy efficiency in buildings, technologies with improved energy efficiency over traditional technologies, or technology solutions for the renewable energy industry.

Firm Name	Topic Number	Project Title	Phase
Industrial Microbes, Inc.	EP-D-15-022	Low-Cost Biological Solution for Reducing Carbon Pollution in Chemical Manufacturing	I
SioTeX Corporation	EP-D-15-024	Industrial Process Pollution Reduction by Development of Amorphous Biogenic Silica to Replace Fumed Silica	I
3D Array Technology LLC	EP-D-15-026	Manufacturing of Ultra-efficient and Robust Nano-array based Lean NOx Trapping Devices	I
Advanced Technologies & Testing Laboratories Inc.	EP-D-15-027	Photo-electro-catalytic Nano-air Filtration	I
dTEC Systems LLC	EP-D-15-031	Phosphorus recovery and high efficiency biological nutrient removal from wastewater with an innovative aerobic granular sludge sequencing batch reactor process	I
Physical Optics Corporation	EP-D-15-034	Regenerative Capacitive Electro-Desalination System (RECED)	I
Metna Co.	EP-D-15-036	An Alternative Concrete Chemistry with Significantly Enhanced Durability, Sustainability, Economy, Safety and Strength	I
Precision Combustion, Inc.	EP-D-15-040	Novel high-capacity, thermally stable, filter nanomaterials for multi-pollutant removal	I
Environmental Fuel Research, LLC	EP-D-16-002	Biofuel Production from Grease Trap Waste	II
Lucid Design Group, Inc.	EP-D-16-004	Using Software and Internet of Things Technology to Drive Behavioral Energy Savings in Commercial Buildings Using Building Orbs	II
Sustainable BioProducts	EP-D-16-007	Direct Conversion of Organic Municipal Solid Waste to Lipids using an Extremophilic Fungus	II

Procedures and mechanisms EPA used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

EPA's SBIR Program includes energy as an overall criterion in selecting which environmental technologies it funds because EPA cares about the lifecycle environmental impacts of the technology and energy demand and usage are major factors in the environmental impact of a technology.

Specific language from the 2014 solicitation addressing lifecycle and energy is as follows and is used repeatedly in outreach about the program:

> *SBIR proposals should directly pertain to EPA's mission of protecting human health and the environment and should consider the lifecycle environmental impacts of the technology itself including (if applicable) minimizing resource use, minimizing toxicity of materials, efficient use of water and energy, minimizing pollution and minimizing impacts of disposal.*

EPA also uses energy in specific topic descriptions to give priority to projects that address energy efficiency and renewable energy. For example, the EPA SBIR program solicitation includes energy efficiency and renewable energy criteria in almost all of its environmental topics including Water, Manufacturing and Waste. Specific language from the 2014 solicitation related to energy demand within the food waste topic is as follows:

> *The EPA and the USDA are partnering through the U.S. Food Waste Challenge to address sustainable food management from farm to final disposition. Through this partnership, the EPA is working to reduce food waste, which is the largest component (21 percent) of discarded municipal solid waste. In keeping with the RCRA mandate to conserve resources and energy, and recognizing that an estimated 42 percent of greenhouse gas (GHG) emissions are attributable to materials management activities, the EPA continues to create innovative strategies that emphasize sustainable materials management.*

Specific actions EPA has taken to promote and support energy efficiency and renewable energy research projects

EPA's SBIR program continues to emphasize energy efficiency and renewable energy related topics and priorities at national, regional and state SBIR conferences and includes energy efficiency and renewable energy as criteria for other topic areas including water, waste and manufacturing. Emphasis has been placed on opportunities for small businesses to submit new technology proposals which emphasize energy efficiency (and therefore reduction of carbon emissions) in almost all topic areas in the EPA solicitation. This is emphasized as a way to demonstrate the lifecycle environmental benefits of the proposed technology.

National Aeronautics and Space Administration (NASA)

Examples of NASA SBIR/STTR projects related to energy efficiency or renewable energy

For FY 2015, NASA's SBIR/STTR program had specific subtopics that actively solicit for technology in energy generation and storage in the form of photovoltaics, advanced batteries, and nuclear technology. The topics include:

- A1.02 - Aerodynamic Efficiency Drag Reduction Technology
- A1.03 - Low Emissions Propulsion and Power
- A1.08 - Ground Testing and Measurement Technologies
- A2.01 - Flight Test and Measurements Technologies
- H3.02 - Bioregenerative Technologies for Life Support
- H8.02 - Solid Oxide Fuel Cells and Electrolyzers
- H8.03 - Advanced Photovoltaic Systems
- H10.01 - Cryogenic Purge Gas Recovery and Reclamation
- H14.02 - International Space Station (ISS) Demonstration of Improved Exploration Technologies
- H14.03 - Recycling/Reclamation of 3-D Printer Plastic Including Transformation of Launch Package Solutions into 3-D Printed Parts
- H20.01 - Solid and Liquid Waste Management for Human Spacecraft
- S1.01 - Lidar Remote Sensing Technologies
- S1.07 - Airborne Measurement Systems
- S2.02 - Precision Deployable Optical Structures and Metrology
- S3.01 - Power Generation and Conversion
- S3.03 - Power Electronics and Management, and Energy Storage
- S3.06 - Terrestrial and Planetary Balloons
- S4.04 - Extreme Environments Technology
- T3.01 - Energy Harvesting Technology Development
- Z1.01 - Modeling and Measurements for Propulsion and Power

Energy Independence and Security Act of 2007

Phase I awards made in FY 2015 associated form these topics include:

Firm Name	Proposal Title	Contract #
MicroLink Devices, Inc.	High Efficiency Direct Methane Solid Oxide Fuel Cell System	NNX15CC53P
MicroLink Devices, Inc.	Fabrication of T-SOFC via Freeze Cast Methods for Space and Portable Applications	NNX15CC54P
Hyper Tech Research, Inc.	20 W High Efficiency 1550 nm Pulsed Fiber Laser	NNX15CC58P
MicroLink Devices, Inc.	Advanced Mirror Material System	NNX15CC67P
FastCAP Systems Corporation	High-Efficiency, Radiation-Hard, Lightweight IMM Solar Cells	NNX15CC71P
Freedom Photonics, LLC	Toward Autonomous Stable Energy Management of Hybrid Electric Aircraft Propulsion Systems	NNX15CD20P
ElectroChem, Inc.	Microwave Extraction of Water from Boreholes in Regolith	NNX15CG26P
Advanced Fuel Research, Inc.	Parahydrogen-Orthohydrogen Catalytic Conversion for Cryogenic Propellant Passive Heat Shielding	NNX15CJ46P
Techshot, Inc.	Wide Temperature, High Voltage and Energy Density Capacitors for Aerospace Exploration	NNX15CM23P
FastCAP Systems Corporation	Advanced Hybrid Stage	NNX15CP59P
Sustainable Innovations, LLC	High Figure-of-Merit Macro-Structured Thermoelectric Materials	NNX15CS11P

In addition, the following Phase II awards were made:

Firm Name	Proposal Title	Contract #
Yanhai Power, LLC	A Low-Power Medical Oxygen Generator	NNX15CC12C
Mark O'Neill, LLC	STARwatch to Deliver Objective Sleep Measures for Spaceflight Operations	NNX15CC14C
LaunchPoint Technologies, Inc.	Fast Acting Flow Control Valve	NNX15CC15C
MicroLink Devices, Inc.	Fabrication and Testing of Nuclear-Thermal Propulsion Ground Test Hardware, Phase II	NNX15CC20C
ORMOND, LLC	Highly Efficient, Solid State Hydrogen Purification for Resource Recovery	NNX15CC21C
MicroLink Devices, Inc.	Laser-Directed CVD 3D Printing System for Refractory Metal Propulsion Hardware, Phase II	NNX15CC26C

Firm Name	Proposal Title	Contract #
Physical Sciences, Inc.	Ultra-Flexible Advanced Stiffness Truss for Large Solar Arrays	NNX15CC35C
Tao of Systems Integration, Inc.	>1,000 W/kg Rad-Hard, High-Voltage PV Blanket at < $50/W IMM Cell Cost.	NNX15CD07C
L'Garde, Inc.	Self-Healing, Self-Diagnosing Multifunctional Hybridsil Composites for EVA Space Suit Pressure Garment Systems	NNX15CL10C
Sustainable Innovations, LLC	Low Coherence, Spectrally Modulated, Spherical Wavefront Probe for Nanometer Level Free-Form Metrology	NNX15CM07C
Lynntech, Inc.	Real-Time Geometric Analysis of Additive Manufacturing	NNX15CS05C

Procedures and mechanisms NASA used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

NASA searches—via various wide-ranging research endeavors (including SBIR/STTR) — for novel concepts and technologies that provide advanced capabilities at ever improving levels of efficiency in missions and projects across all Mission Directorates. At the heart of NASA's needs is advanced technologies for energy/power generation and storage – touching areas from photovoltaics, batteries, to nuclear technology for space exploration. NASA missions require maintaining power far from the Earth, for long periods of time, with no means of repair or refueling. Further, NASA technology must be resilient to survive the launch environment, as well as be light enough to be launched by existing launch vehicles. Therefore, there is no special priority required for technology associated with energy efficiency, as it is a critical thrust to all of NASA's missions.

Specific actions NASA has taken to promote and support energy efficiency and renewable energy research projects

There are a variety of NASA projects associated with renewable energy – green aviation, environmental protection, clean energy, and sustainable systems. Information about these projects, in areas of biofuels, solar energy, and wind energy, and be found here: http://www.nasa.gov/centers/ames/greenspace/index.html. NASA's efforts in the area of

energy innovation associated with responses to climate change can be found here: http://climate.nasa.gov/energy_innovations.

National Science Foundation (NSF)

Examples of NSF SBIR/STTR projects related to energy efficiency or renewable energy

Firm Name	Project Title	Phase	Award Amount
IOP Technologies LLC	Examination of Diamond Cathodes to Advance Thermionic Energy Conversion-Solid Oxide Fuel Cell Technology for Use in Onsite, DC, Power Generation Needs	I	$150,000
Renerge, Inc.	River Electrical Energy Devices	I	$150,000
Blue Sky Engineering, Inc.	High Efficiency Flexible Solar Panels	I	$149,994
Nohms Technologies	Sulfur-infused carbon nanostructures for High Energy Density Secondary Batteries	II	$500,000
Infinium, Inc.	High Efficiency BioMass Power Generation Using Liquid Tin Anode Fuel Cell	II	$374,995

Procedures and mechanisms NSF used during the reporting fiscal year to give priority in the SBIR/STTR programs to energy efficiency and renewable energy projects

Research in energy efficiency and renewable energy systems has been a significant component of 2015 NSF SBIR/STTR solicitations in the topic areas including Chemical Technologies, Electronic Hardware, Robotics and Wireless Technologies, Advanced Materials and Instrumentation, Advanced Manufacturing and Nanotechnology and Photonic Devices.

Specific actions NSF has taken to promote and support energy efficiency and renewable energy research projects

In these solicitations NSF has used energy efficiency and renewable energy as a tiebreaker in making funding decisions. This has allowed the program to fund energy efficiency and renewable energy projects without compromising the quality standards or established criteria of the program. In FY 2015, NSF funded approximately 100 awards where energy efficiency and/or renewable energy were a major thrust of the proposal.