

# FY 2012 Phase I Release 3 SBIR/STTR Award Selections\*

## By Topic

### Table of Contents

[Topic: 1 - Advanced Manufacturing](#)

[Topic: 2 - Biomass](#)

[Topic: 3 - Buildings](#)

[Topic: 4 - Hydrogen and Fuel Cell Technologies](#)

[Topic: 5 - Solar](#)

[Topic: 6 - Vehicles](#)

[Topic: 7 - Water](#)

[Topic: 8 - Wind](#)

**\*The following small businesses have been selected for award; however, all awards are pending until negotiations are completed between each small business and the DOE.**

### Topic: 1 -Advanced Manufacturing

---

#### Company

Aspen Aerogels, Inc  
30 Forbes Road, Bldg B  
Northborough MA, 01532-2501

#### Title

High Performance Insulation for Industrial Processes

#### Summary

Benefits of the new insulation to the U.S. include significant energy savings. These savings will translate into more competitive domestic manufacturing, leading to job creation and reduced insulation requirements compared to current state-of-the-art carbon fiber insulation products.

---

#### Company

Ceralink Inc.  
105 Jordan Road  
Troy NY, 12180-8376

#### Title

Carbon Aerogel Natural Gas Sorbent Energy Storage Material

#### Summary

This project will develop the highest storage capacity carbon aerogel sorbent for use in natural gas vehicles. This technology will help enable the widespread adoption of natural gas vehicles by extending the driving range and making low pressure filling a commercial and residential reality.

---

## **STTR Project**

### **Company**

Drs Research  
1917 W.234th Street  
Torrance CA, 90501-5532

### **Title**

Novel Thermal Spray Lubricious Oxide Coatings

### **Summary**

This project will develop and implement a novel solid lubricant oxide based coatings. These coatings are durable both at room temperature as well as at high temperature, making them useful in automotive and aerospace applications.

---

### **Company**

Ferric Semiconductor, Inc.  
3111 Broadway, #1E  
New York NY, 10027-4605

### **Title**

Integrated DC-DC Converters Using Thin-Film Magnetic Power Inductors

### **Summary**

This project will allow voltage regulators to be integrated with digital microprocessors, providing improved control of the power supply and, consequently, a significant improvement in energy efficiency. This technology will improve the competitiveness of US semiconductor manufacturers, while reducing national electricity consumption by as much as 15 billion kWh annually

---

### **Company**

Itn Energy Systems, Inc  
8130 Shaffer Parkway  
Littleton CO, 80127-4107

### **Title**

Low-Cost, Nanolaminate Transparent Conductive Oxides for Thin Film Electrochromic and Photovoltaic Devices

### **Summary**

This project will develop a low-cost, nanolaminate transparent conductive oxide (TCO) as an alternative to indium tin oxide (ITO) for application in thin-film electrochromic windows (EC), photovoltaics (PV), and flat panel displays (FPD)

---

## **Company**

Lynntech, Inc.  
2501 Earl Rudder Freeway South  
College Station TX, 77845-6023

## **Title**

Flexible, Energy Efficient Ammonia Synthesis

## **Summary**

The manufacture of ammonia is one of the most energy intensive and important manufacturing processes worldwide. Lynntech's proposed method for synthesis of ammonia would reduce energy required for the process, decrease dependence on fossil fuels, including imports, and enable use of native renewable resources such as solar or wind.

---

## **Company**

Novarials Corporation  
62 Musket Drive  
Nashua NH, 03062-1441

## **Title**

Flexible Ceramic Hollow Fiber Membranes

## **Summary**

This project will make high performance and low cost ceramic membranes that will successfully address many tough separation and filtration needs in water, chemical, oil, food, beverage, and gas industry. This will be a quantum leap technology in membrane industry.

---

## **STTR Project**

## **Company**

Proton Energy Systems  
10 Technology Drive  
Wallingford CT, 06492-1955

## **Title**

Single Step Manufacturing of Low Catalyst Loading Electrolyzer MEAs

## **Summary**

Proton OnSite manufactures hydrogen generation systems which can be integrated with renewable energy sources to generate hydrogen fuel while producing minimal carbon footprint. This project aims to reduce the energy required to manufacture these units through development of improved electrode application methods and reduction in platinum group metal usage.

---

## **Company**

Radiation Monitoring Devices, Inc.  
44 Hunt Street  
Watertown MA, 02472-4699

## **Title**

Energy Saving Through Advanced Photovoltaic Materials and Manufacturing Technology

## **Summary**

The combination of the proposed efficient manufacturing technology and the enhanced performance of our advanced photovoltaic materials is expected to minimize both manufacturing cost and cost/watt for generating solar power. The proposed solar technology has the potential to provide up to 60% efficiency for single-junction solar cells, compared to 31% offered by current materials.

---

## **Topic: 2 -Biomass**

---

## **Company**

Cleanvantage, Llc  
2750 Salk Ave.  
Richland WA, 99354-1669

## **Title**

Producing Oligosaccharides from Biomass to Buy Down the Cost of Producing Biofuels

## **Summary**

The research will shed light on the major challenges in separating the solid and liquid phases of biomass after pretreatment as well as separating out monomeric sugars from oligomers of which little is currently know.

---

## **Company**

Tda Research, Inc.  
12345 W. 52nd Ave.  
Wheat Ridge CO, 80033-1916

## **Title**

Conversion of Algal Biomass to Drop-In Fuels

## **Summary**

This project will develop a process for producing renewable drop-in fuels from algal biomass.

---

## **Topic: 3 -Buildings**

---

### **Company**

Advanced Cooling Technologies, Inc.  
1046 New Holland Ave.  
Lancaster PA, 17601-5606

### **Title**

Fast-Payback Polymeric Solar Water Heaters with Controlled Heat Transfer

### **Summary**

The objective of this SBIR Phase I proposal is to reduce the payback period of solar water heaters by replacing heavy and costly metal based solar collectors with lightweight, inexpensive polymer based solar collectors, enabled by an innovative, passive, thermal management system. The proposed technology will reduce the payback time of solar water heating systems to less than 5 years, making it more cost effective to participate in solar technologies.

---

### **Company**

Aerophase, Inc.  
401 Mountain View Avenue  
Longmont CO, 80501-3318

### **Title**

Fast Payback Solar Water Heater

### **Summary**

Water heaters use about 16% of the energy used in the typical home which is an unnecessary financial burden on most home-owners and an unnecessary burden on US energy supplies. Aerophase has developed a new low cost solar water heater that will encourage many homeowners to switch to solar.

---

### **Company**

Applied Nanotech, Inc.  
3006 Longhorn Blvd, Ste 107  
Austin TX, 78758-7631

### **Title**

CarbAl (TM) Based Circuit Board for Power LED Packaging

## Summary

This project will create the advanced high-performance power LED circuit board that can effectively dissipate heat generated by power LEDs and stabilize temperature to minimize color drift.

---

## Company

Aspen Aerogels, Inc  
30 Forbes Road, Bldg B  
Northborough MA, 01532-2501

## Title

Pressure Sensitive Aerogel Bead with PCM for Building Envelopes

## Summary

Energy conservation in buildings and structures can be improved by utilizing high performance blown-in aerogel insulation enhanced with Phase Change Materials (PCMs). Aerogel insulation has the highest Rvalue per inch of all insulation materials and PCMs have high latent heat capacity which can shift energy peak energy loads from daytime towards cheaper night time.

---

## Company

Energy Focus, Inc.  
32000 Aurora Road  
Solon OH, 44139-2814

## Title

Lighting Controls Software for Self-Commissioning and Optimized Energy Savings

## Summary

This project will develop innovative controls software that will be able to save billions of dollars in electricity across the US through self-commissioning and optimization of daylight. The developed lighting system is completely wireless, inherently small and affordable while being self-contained.

---

## Company

Heliocentric Llc  
12341 E Windflower Lane  
Salt Lake City UT, 84121

## Title

## Summary

This project will develop a new approach to whole-building energy systems control. Advanced building controls will save the U.S. billions of dollars in energy costs by making buildings use energy more intelligently, thus reducing energy demand.

---

## STTR Project

### Company

Heliotrope Technologies, Inc.  
6137 Girvin Dr.  
Oakland CA, 94611-2444

### Title

Low Cost Nanostructured Smart Window Coatings

### Summary

The objective of this project is to develop a low cost nanostructured smart window coating that reduces building energy consumption by dynamically optimizing solar gain.

---

### Company

Ingreenium, Llc  
1401 White Peak Court  
Fort Collins CO, 80525-8808

### Title

Low-Cost Smart Power Sensors with Condition Monitoring Capabilities

### Summary

InGreenium, LLC proposes wireless, true power sensing, at the DOE \$20 target cost including voltage and current sensors. InGreenium will combine digital signal processing techniques with enterprise software methods to reduce cost, improve measurement accuracy, and implement condition monitoring technologies to support preventative maintenance of electric loads.

---

### Company

Mainstream Engineering Corporation  
200 Yellow Place  
Rockledge FL, 32955-5327

## **Title**

Low-Cost Flat Panel Solar Hot Water Heaters

## **Summary**

This project will develop a solar collector that will significantly reduce the cost of solar water heating systems. The unit is robust, easy to install, and will have efficiencies potentially greater than existing units. It has the potential to reduce the nation's energy burden by 14,000,000 barrels of oil each year.

---

## **Company**

Promethient Llc  
16663 Smokey Hollow Road  
Traverse City MI, 49686-8343

## **Title**

Direct Insertion Ground Loop Heat Exchanger

## **Summary**

This program supports the design and development of ground source heat pump equipment that will greatly reduce the cost of installing this energy efficient means of heating and cooling buildings.

---

## **Company**

Sheetak Inc.  
4020 S Industrial Drive, Suite 100  
Austin TX, 78744-1078

## **Title**

Heat Pump Water Heater using Solid-State Energy Converters

## **Summary**

Sheetak proposes to use its innovative solid-state heat pump technology for application in water heaters. This thin film technology has the potential of significantly reducing the electrical energy consumed in water heating without affecting the cost. Sheetak will manufacture its solid-state heat pump products in Austin, TX.

---

## **STTR Project**

## **Company**

Solarno, Inc  
153 Hollywood Dr  
Coppell TX, 75019-7306

## **Title**

Carbon Nanotube-based Solar Water Heater

## **Summary**

This project proposes to significantly improve the evacuated solar tube collectors (ETC) by utilizing the “dry-drawable” carbon nanotube (CNT) sheets for solar energy absorption and CNT multifunctional nanocomposites with functional layers of heat accumulators and heat transporters.

---

## **Company**

Universal Display Corporation  
375 Phillips Blvd  
Ewing NJ, 8618

## **Title**

Novel Low Cost Single Layer Outcoupling Solution for OLED Lighting

## **Summary**

This project will develop and demonstrate low cost, thin structures to improve the efficiency and lower the manufacturing cost of OLED lighting panels. OLED lighting is expected to become a new environmentally friendly energy saving green lighting technology, to replace current energy inefficient lighting, with the potential for up to 6,000 new green jobs by 2017.

---

## **Company**

V-glass, Llc  
W265 N3011 Peterson Drive  
Pewaukee WI, 53072-4431

## **Title**

Vacuum Glazing with Glass Bonding Able to Withstand ASTM-2190

## **Summary**

This project will develop a process for welding flexible metal foil seals to the perimeter edge of vacuum glazing, thereby enabling production of R10 or better windows for the same cost. Not only will this will secure for the U.S. a dominant position in a global market totaling \$8 billion per year, but can eventually reduce total US energy use (and greenhouse gas emissions) as much as 5% while improving comfort.

---

## **Company**

Xergy Incorporated  
105 Park Avenue, Seaford Industrial Park  
Seaford DE, 19973-9478

## **Title**

Advanced Hybrid Water-Heater using ECC

## **Summary**

This proposal is based on a transformational and disruptive technology of utilizing electrochemical compression to operate heat pump cycles.

---

## **Topic: 4 -Hydrogen and Fuel Cell Technologies**

---

## **Company**

Composite Technology Development, Inc.  
2600 Campus Drive, Suite D  
Lafayette CO, 80026-3359

## **Title**

Optimizing the Cost and Performance of Composite Cylinders for H2 Storage using a Graded Construction

## **Summary**

The state-of-the-art H2 storage vessels for fuel cell cars are too expensive to manufacture because of high carbon fiber costs. The program will seek to reduce the cost of these vessels by 25% by using cheaper fibers from ORNL in a graded construction of the vessel wall.

---

## **Company**

Nextgen Aeronautics, Inc.  
2780 Skypark Drive, Suite 400  
Torrance CA, 90505-7519

## **Title**

4b Low-cost Integrated Nanoreinforcement for Composite Tanks (LINCT)

## **Summary**

This project will incorporate a low-cost nanoreinforcement into high-pressure all-composite tank designs to further increase pressure and lower costs

---

## **Company**

Treadstone Technologies, Inc.  
201 Washington Road  
Princeton NJ, 08540-6449

## **Title**

Novel Structured Metal Bipolar Plates for Low Cost Manufacturing

## **Summary**

This SBIR project will develop a low cost novel structured metal bipolar plate technology for low temperature PEM fuel cells for transportation applications

---

## **Topic: 5 -Solar**

---

## **Company**

Black Hills Nanosystems Corporation  
2445 Dyess Avenue  
Rapid City SD, 57701-9301

## **Title**

Optimal Multijunction Solar Cells for CPV under Realistic Conditions

## **Summary**

The proposed project will provide a pathway for terrestrial CPV (500 to 700 Suns) multijunction solar cells that will maintain extremely high efficiencies at realistic operating temperatures. The thrust of the proposed project will adapt an integration approach from MEMS to III-V materials grown lattice-matched to gallium arsenide substrates.

---

## **Company**

Brittmore Group Llc  
155 S 12th St  
San Jose CA, 95112-2137

## **Title**

Utility-Scale PV Cost Reduction by Automated Panel Installation System

## **Summary**

This project brings industrial automation equipment to utility scale solar panel installation. Their method eliminates risks and costs of handling solar panels, decreases installation time, and enables the industry to shift to larger panel assemblies - thus realizing increased cost reduction and faster revenue

---

## **Company**

Cool Earth Solar, Inc.  
4659 Las Positas Road, Suite C  
Livermore CA, 94551-9631

## **Title**

Research and Development of an Innovative Inflated High Concentrating PV Module

## **Summary**

Cool Earth Solar has an innovative concentrating photovoltaic (CPV) system design that promises to dramatically lower the cost of solar and meet the Department of Energy's SunShot goals with an industry-leading 33% efficient module. This project will fund the development of a sub-scale prototype unit to test and validate the design.

---

## **Company**

Cool Earth Solar, Inc.  
4659 Las Positas Road, Suite C  
Livermore CA, 94551-9631

## **Title**

Research and Development of an Innovative Inflated Medium Concentrating PV Module for Achieving an Installed PV Module Cost of \$0.50/W Before 2020

## **Summary**

Cool Earth Solar has an innovative concentrating photovoltaic (CPV) system design that promises to dramatically lower the cost of solar and meet the Department of Energy's SunShot goals of solar installed for \$1/W and an electricity cost below 6 cents per kilowatt-hour by 2020. This project develop a sub-scale prototype unit to test and validate the design.

---

## **Company**

Glint Photonics, Inc.  
1455 Adams Drive Suite 1288  
Menlo Park CA, 94025-1438

## **Title**

Wide Angle Self-Tracking Concentrator Photovoltaics

## **Summary**

This project will develop a new type of solar panel that costs 50% to 75% less than existing technologies. This stationary panel uses optical materials that concentrate the sunlight onto only a small area of solar cells and that automatically adjust to the changing position of the sun.

---

## **Company**

Hyper-therm High-temperature Composites, Inc.  
18411 Gothard Street, Unit B  
Huntington Beach CA, 92648-1208

## **Title**

Ceramic Matrix Composites for Concentrating Solar Power Receivers

## **Summary**

This project will encompass the design of a pressurized CMC tubular solar receiver; the demonstrated fabrication of receiver prototypes and material for coupon-level materials testing; and the evaluation of thermal and mechanical materials properties, as well as the structural and thermal performance of the solar receiver prototypes.

---

## **Company**

Ideal Power Converters, Inc  
5004 Bee Creek Road, Suite 600  
Spicewood TX, 78669-6827

## **Title**

3-Port PV & Battery Converter Improves Cost and Efficiency of Combined PV/Battery Systems

## **Summary**

This project will develop a 3-port PV & Battery Converter that eliminates the power converter cost and efficiency penalties of combined PV and batteries. This will accelerate adoption of combined PV and battery systems for EV charging, grid-storage for peak demand reduction, and off-grid diesel generator replacement

---

## **Company**

Inspired Light, Llc  
2101 Jack London St.  
Corvallis OR, 97330-6916

## **Title**

Self Configuring Solar Tracking System

## **Summary**

Concentrating photovoltaic (CPV) systems show great promise due to cost efficiency; however breakthroughs are needed in Balance of System design and costs. This project will develop a very low cost, lightweight, self-configuring architecture and mechanism for CPV solar tracking, significantly reducing installation and system costs while expanding applications.

---

## **Company**

Next Energy Technologies Inc  
5385 Hollister Ave, #115, Bldg 6  
Santa Barbara CA, 93111-2391

## **Title**

Reliability Improvement in Solution Processable Roll to Roll Photovoltaic Modules

## **Summary**

Printable photovoltaics aim to produce megawatt scale energy generation within 5 years through the use of easily scalable, soluble small molecule technology

---

## **Company**

Skyfuel, Inc.  
18300 West Highway 72  
Arvada CO, 80007-8201

## **Title**

Development of a Low Cost Ultra Specular Advanced Polymer Film Solar Reflector

## **Summary**

A low-cost polymer film solar reflector is being developed that will allow US Department of Energy's cost goals for concentrating solar power systems to be achieved. This Ultra Specular Advanced (USA) mirror is based on a revolutionary front surface reflector technology.

---

## **Company**

Sporian Microsystems, Inc.  
515 Courtney Way Suite B  
Lafayette CO, 80026-8821

## **Title**

Advanced Ceramic Materials and Packaging Technologies for Realizing Sensors for Concentrating Solar Power Systems

## **Summary**

A novel high temperature ceramic sensor is proposed to help improve the safety and efficiency of existing and future concentrating solar power systems

---

## **Company**

United Silicon Carbide, Inc.  
7 Deer Park Drive, Suite E  
Monmouth Junction NJ, 08852-1921

## **Title**

15 kV GTO Thyristor Module for Use in Small, Highly Efficient Current Source Inverters Utilizing AC-Link™ Technology

## **Summary**

This project will develop SiC switch technology to address the need for cheaper power conversion and energy storage management, which further enable reliable penetration of renewable resources such as solar power.

---

## **Topic: 6 - Vehicles**

---

### **Company**

Brimrose Technology Corporation  
19 Loveton Circle, P.O. Box 616  
Sparks MD, 21152-9201

### **Title**

Magnesium and Manganese Silicides for Efficient and Low Cost Thermo-Electric Power Generation

### **Summary**

This project will investigate thermoelectric power generation technology that can utilize the wasted heat from vehicle emissions and convert it to electric power. Advancements in material and devices, which will lead to the production of \$1/Watt of electrical power can be implemented on a manufacturing level will be investigated

---

### **Company**

Concepts Eti, Inc. Dba Concepts Nrec  
217 Billings Farm Road  
White River Junction VT, 05001-9486

### **Title**

Variable Inlet Bypass for Efficient Wide Flow Range Turbocharger Compressor

### **Summary**

This project will advance and demonstrate efficient wide operating range VBCC technology to the level where, when integrated analytically within an advanced automotive turbocharger application, a potential for 3% reduction in fuel consumption for the FTP cycle shall be provided, with associated transient response and cost benefits

---

## **STTR Project**

### **Company**

Creare Incorporated  
16 Great Hollow Road

Hanover NH, 03755-3116

## **Title**

Thermoelectric Systems for High-Efficiency, Low-Cost Vehicle Waste Heat Recovery

## **Summary**

This project aims to improve fuel efficiency, reduce carbon dioxide production, and reduce dependence on foreign oil by developing technology to convert the heat in vehicle exhaust to electric power. The proposed generator combines innovative heat transfer components with novel, thermoelectric materials to produce a system with high efficiency and reliability at low cost

---

## **Company**

Electro-mechanical Associates, Inc.  
3744 Plaza Dr.  
Ann Arbor MI, 48108

## **Title**

Diesel Engine Efficiency and Emissions Improvement Via Variable Compression and Expansion Ratios

## **Summary**

A two-step valve lifter is proposed for Diesel fuel economy improvement of over 10% along with a reduction in carbon dioxide, particulates and NOx emissions.

---

## **Company**

Electron Energy Corporation  
924 Links Ave.  
Landisville PA, 17538-1615

## **Title**

High coercivity, high energy product Nd-Fe-B magnets with less or no dysprosium

## **Summary**

To mitigate the rare earth supply chain vulnerability and reduced availability of dysprosium in the earth crust, Electron Energy Corporation will employ new technologies to develop dysprosium-free and, alternatively, dysprosium-lean Neo magnets for high-performance motors and generators. These magnets will have immediate implementation, without the need of machine structural changes.

---

## **Company**

Eskra Technical Products, Inc.  
2595 Hwy I

Saukville WI, 55080-1511

## **Title**

Low Cost Solvent Free Manufacturing of Lithium Ion Prosmatic and Bipolar Cell Development for Advanced Vehicle Applications

## **Summary**

The project will benefit distributed energy systems such as smart grid, renewable energy storage such as used for wind and solar energy as well as consumer electronics and advanced automotive. Lower manufacturing cost as well as allowing flexible manufacturing will also allow for a more world competitive US battery industry

---

## **Company**

Excellatron Solid State, Llc  
263 DECATUR STREET  
Atlanta GA, 30312-1705

## **Title**

A High Energy, High Power all Solid State Battery

## **Summary**

Further development of rechargeable lithium batteries that will make the batteries adequate for EV/HEV applications requires dramatic improvement of the energy storage capabilities of the batteries. This project proposes to fabricate novel high energy, high power all solid state batteries that have high performance and are safe in order to make the lithium batteries adequate for high energy applications such as electric vehicles.

---

## **Company**

Farasis Energy, Inc.  
21363 Cabot Blvd.  
Hayward CA, 94545-1657

## **Title**

New, High Capacity, High Rate Cathode Material for Li-Ion Batteries

## **Summary**

A novel approach to increasing the performance and capacity of Li-ion cells will be developed. Use of the technology could accelerate the adoption of efficient distributed power systems and EVs by greatly increasing the life of the battery systems.

---

## **Company**

Mainstream Engineering Corporation

200 Yellow Place  
Rockledge FL, 32955-5327

## **Title**

Hybrid Electric Turbocharger for Exhaust Energy Recovery and Transient Lag Reduction

## **Summary**

Reducing vehicular fuel consumption is critical for sustaining U.S economic and environmental wellbeing. Mainstream Engineering is developing a hybrid electric turbocharger for cars and trucks that both reduces fuel consumption and improves drivability

---

## **Company**

Mainstream Engineering Corporation  
200 Yellow Place  
Rockledge FL, 32955-5327

## **Title**

Compact Differential Compression/Expansion Ratio Engine

## **Summary**

This project will develop a mechanical DCE engine with substantial efficiency improvements over current DCE approaches. The technology will be durable and elegant, as well as easily adaptable to many different engines. The first application for the technology will be to create a DCE variant for Mainstream's AMD45 engine.

---

## **Company**

Makel Engineering, Inc.  
1585 Marauder Street  
Chico CA, 95973-9064

## **Title**

High Resolution Fast Response NOx Sensor for High Fuel Efficiency Vehicles

## **Summary**

A low cost, high resolution, fast response NOx sensor for NOx emissions monitoring and control is being developed. The sensor will enable onboard monitoring of NOx, verifying that NOx reduction systems are working effectively.

---

## **Company**

Motiv Power Systems, Inc.  
1165 Chess Drive, Suite E  
Foster City CA, 94404-1113

## **Title**

Motiv's Novel Charge-Pump Battery Management System

## **Summary**

This project aims to develop and prototype Motiv's Battery Charge Management System (BCMS)

---

## **Company**

Nanohmics Inc.  
6201 E Oltorf STE 400  
Austin TX, 78741-7509

## **Title**

Innovative NOx Sensor for Tailpipe Emissions

## **Summary**

The development of new robust and cost effective sensors for chemical diagnostics will enable improved analysis of combustion products from diverse sources— from vehicles to energy generation in gas turbines. This enhanced analysis will provide the feedback necessary to run combustion these processes at their highest efficiency with the lowest pollution output.

---

## **Company**

Nanomech Inc  
534 W Research Center Blvd  
Fayetteville AR, 72701-6534

## **Title**

Multicomponent Nanomanufactured Drop-in Lubricant Technology for Enhancing Engine Friction Reduction

## **Summary**

This project will demonstrate feasibility to design and develop novel nanomanufactured multicomponent lubricant additives applicable for engine, especially engineered as additive for enhancing engine economy with at least 3%.

---

## **Company**

Nextech Materials, Ltd.  
404 Enterprise Drive  
Lewis Center OH, 43035-9423

## **Title**

NOX Sensor for Diesel Engine Emissions Systems

## **Summary**

This project aims to develop a sensor for detecting low levels of nitrogen oxide pollutants in diesel-powered cars and trucks. The sensor will enable these pollutants to be eliminated so that environmental regulations are followed

---

## **Company**

Ngimat Llc  
2436 Over Drive Suite B  
Lexington KY, 40511-2637

## **Title**

Nanocomposite Coatings for Low-Cost Motor Windings in Electric Vehicles

## **Summary**

The project addresses development of a magnet wire insulation for electric vehicle motors containing high thermal conductivity nano-dielectric particles that will contribute significantly to improved motor heat dissipation and reduced motor operating temperature, size, and cost, thereby increasing power density and efficiency.

---

## **Company**

Pixelligent Technologies Llc  
6411 Beckley Street  
Baltimore MD, 21224-6538

## **Title**

Nanocrystal Additives for Advanced Lubricants

## **Summary**

This project will develop high-performance nano additives for automotive lubricant oils, targeting to improve fuel efficiency and prolong the lifetime of engines and machine parts. With the added benefit of displacing traditional organic additives that cause harmful emissions, the adoption of nano additive-based lubricants will translate into significant economic and environmental impacts.

---

## **Company**

Questek Innovations Llc  
1820 Ridge Avenue  
Evanston IL, 60201-3621

## **Title**

Computational Design and Development of Low Cost, High Strength, Low Loss Soft Magnetic Materials for Traction Drive Motor Applications

## **Summary**

This project will design and develop low cost, high strength, low core loss soft magnetic core materials at the prototype scale that show promise to provide cost savings in traction drive motor applications.

---

## **STTR Project**

### **Company**

Rotating Sleeve Engine Technologies Inc.  
10805 Mellow Lane  
Austin TX, 78759-0000

### **Title**

Rotating Liner Engine: Improving Efficiency of Heavy Duty Diesels by Significant Friction Reduction, and Extending The Life of Heavy Duty Engines

### **Summary**

This project will demonstrate that the rotating liner engine (“RLE”) can increase fuel efficiency in heavy duty vehicles by about 3.5-4% at full load, about 25% at idle, and about 10% for an average duty cycle, can reduce CO<sub>2</sub>, NO<sub>x</sub> and PM and reduce engine wear

---

## **STTR Project**

### **Company**

Sheetak Inc.  
4020 S Industrial Dr., Suite 100  
Austin TX, 78744-1078

### **Title**

High Efficiency Thin Film Thermoelectric Generators (HiE TFTEGs) for Vehicles

### **Summary**

This project proposes to use its innovative thermoelectric manufacturing platform for bringing innovative materials developed by NASA’s Jet Propulsion Lab to mass applications in automobiles and other appliances which has a potential to significantly improve energy efficiency of these products and thereby reduce USA’s reliance on imported oil.

---

### **Company**

Sinode Llc  
600 Davis Street, 3rd Floor West  
Evanston IL, 60201-4488

## **Title**

High Energy Anode Material Development for Li-Ion Batteries

## **Summary**

Development and commercialization of SiNode electrode materials for Li-ion batteries can double the storage capacities of state-of-the-art batteries for transportation, military, and portable electronics applications. These materials can be made through an easily scalable process that is much cheaper than competing technologies with comparable technical performance.

---

## **Company**

Tda Research, Inc.  
12345 W. 52nd Ave.  
Wheat Ridge CO, 80212-1916

## **Title**

High Capacity Hybrid Ultracapacitors for HEVs

## **Summary**

This project will develop a totally new type of battery that will easily meet the high current demands of HEVs. These HEVs decrease energy use by 5 – 8% and are more attractive to cost sensitive consumers due to their lower incremental cost.

---

## **Company**

Tda Research, Inc.  
12345 W. 52nd Ave.  
Wheat Ridge CO, 80212-1916

## **Title**

A Novel Exhaust after Treatment Catalyst

## **Summary**

This project will develop a new exhaust after-treatment system that will provide U.S. automobile manufacturers with a cost-effective tool to meet increasingly more stringent diesel emissions requirements and allow the expanded use of diesel engines, significantly reducing the U.S. petroleum usage.

---

## **Company**

Xg Sciences, Inc.  
3101 Grand Oak Drive  
Lansing MI, 48911-4224

## **Title**

Low-Cost, High-Energy Si/Graphene Anodes for Li-Ion Batteries

## **Summary**

XG Sciences, a world-leading manufacturer of graphene nanoplatelets used to improve the performance of batteries and capacitors, printed electronics, coatings, and plastic structural components, will demonstrate advanced Lithium-ion battery anode material for extended range electric vehicle applications.

---

## **Company**

Yardney Technical Products, Inc.  
82 Mechanic Street  
Pawcatuck CT, 06379-2154

## **Title**

High-Energy, High-Power Light Weight Lithium Ion Batteries For Electric Drive Vehicle

## **Summary**

This project will develop a transformational battery design that will decrease weight and cost significantly.

---

## **Topic: 7 -Water**

---

## **Company**

Amjet Turbine Systems, Llc  
3588 Main Street  
Keokuk IA, 52632-2001

## **Title**

Power-Dense Lightweight Hydro Turbine/Generators for 20,000+ Low-Head US Dams and Reclamation Conduits that Install In-Line,are Low Cost and Mass Producible

## **Summary**

This project will help start an industry stepping into a void, producing low-cost hydro turbines, making it feasible to generate electricity from low-head dams and rivers all over the country and the world. Over 300 direct jobs will be created in five years as well as another 100 indirect jobs

---

## **Topic: 8 -Wind**

---

## **Company**

Boulder Nonlinear Systems, Inc  
450 Courtney Way  
Lafayette CO, 80026-8878

## **Title**

Compact, Low-power, Offshore 3D Wind Sensor

## **Summary**

This effort will develop a compact, low-power wind sensor to monitor offshore winds and optimize wind power generation. Successful development of the technology will enable small wind sensors to be incorporated into many platforms including ocean-based buoys, wind turbine generators, gliders, unmanned air vehicles, and commercial aircraft.

---

## **Company**

Hyper Tech Research, Inc  
539 Industrial Mile Road  
Columbus OH, 43228-2412

## **Title**

Transportable 5-6MW Superconducting Wind Turbine Generator for use on Land

## **Summary**

This project will address the problem by developing an innovative class of superconducting wind turbine generators that will be lightweight such that they are easily transportable by trucks on present roads and installed on taller towers, thus enabling 5-6 MW land based wind turbine generator systems.

---

## **Company**

Wetzel Engineering, Inc.  
1310 Wakarusa Drive, Suite A  
Lawrence KS, 66049-3854

## **Title**

Field-Assembled Component-Based Rotor Blades

## **Summary**

This project proposes research and development to engineer very large wind turbine rotor blades for land-based machines that avoid expensive and logistically challenging transportation requirements.

---