

Advanced Manufacturing Office Small Business Innovation Research Small Business Technology Transfer Projects Portfolio

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AMO Peer Review
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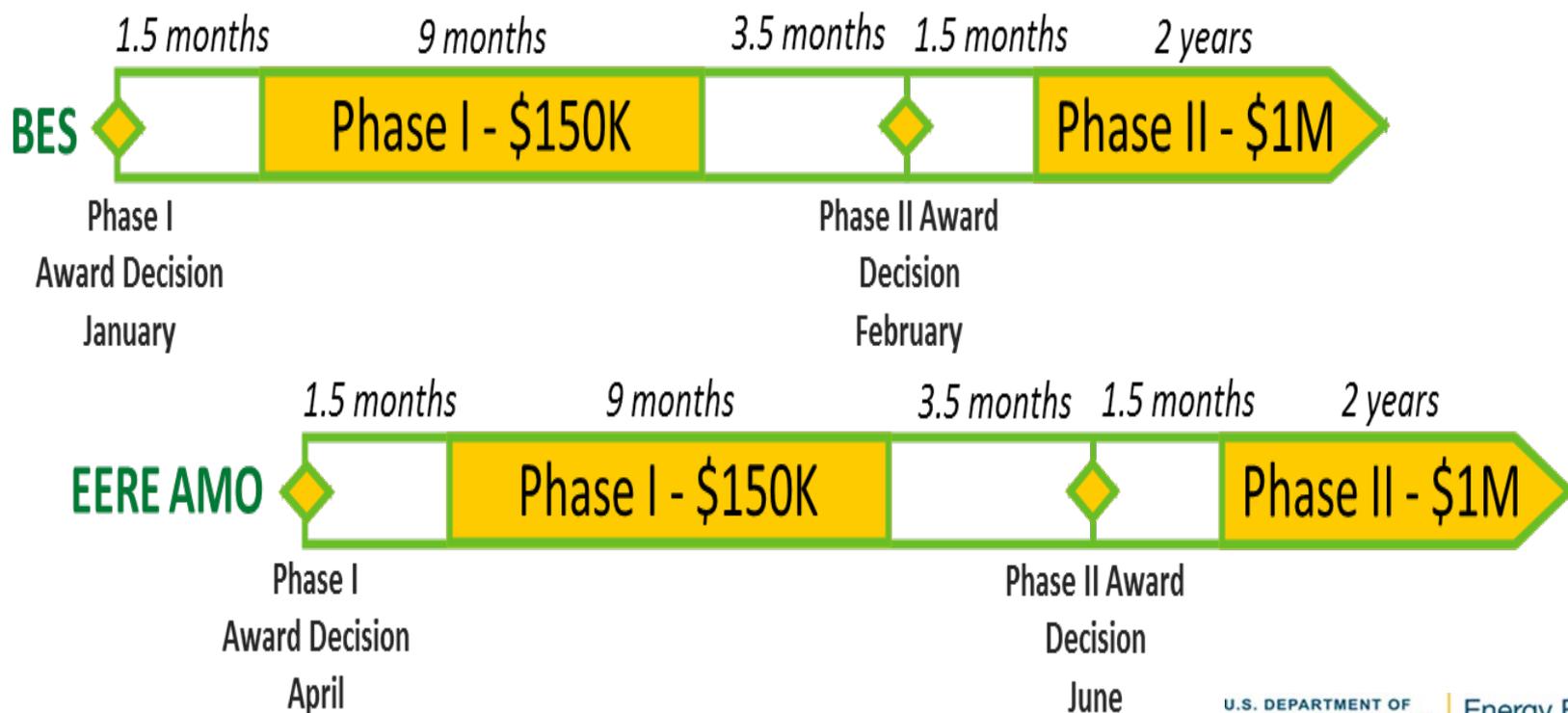
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SBIR/STTR PROGRAM

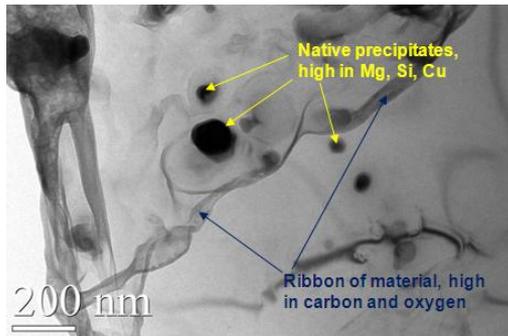
- DOE is one of 11 federal agencies participating in the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs enacted under the *Small Business Innovation Development Act* of 1982.
- The SBIR-STTR programs release Funding Opportunity Announcements (FOAs) for Phase I and Phase II projects twice each fiscal year.
 - **Phase I projects** explore the feasibility of innovative concepts with awards of up to \$150,000 (depending on the topic) over nine months.
 - **Phase II projects** are expanded R&D efforts, with awards of up to \$1M over two years.
- Only companies that have received a Phase I grant may respond to Phase II FOAs.

SBIR/STTR PROGRAM: Funding Schedule

- AMO Portfolio: ~\$23M, ~60 projects
- Project funding follows 1 of 2 funding schedules:
 - Release 1 funded by Office of Basic Energy Sciences (BES)
 - Release 2 funded by EERE Advanced Manufacturing Office (EERE AMO)



Current SBIR/STIR Projects

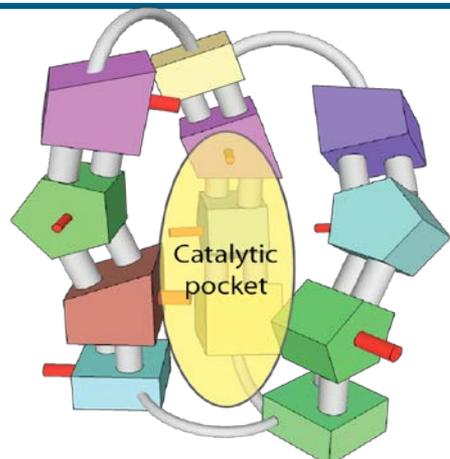


Ultraconductors

Nano-enhanced improvements to the thermal and electrical conductivity of metals offer the prospect of enhanced efficiencies in electric motors, power transmission, heat exchangers, electrical switches, and motor lightweighting.

Phase	Title	Institution
I	Innovative nanoCarbon Infused Metal High Performance Conductors	Munro and Associates
I	A High Performance Composite Conductor	Novarials Corporation
I	Reinforced Commercial Metals for Enhanced Electrical and Thermal Conductivity	Advanced Ceramic Fibers, LLC
I	Integrated computational materials engineering (ICME) approach to develop base alloys suitable for covetic conversion and scale-up	QuesTek Innovations LLC
I	Designing New Economical and Scalable High Performance Aluminum Alloys for Overhead Electric Transmission Conductors	NanoAl
I	Increased Energy Efficiency: Applications of Highly Conductive Aluminum Covetic	GDC Industries, LLC

Current SBIR/STIR Projects

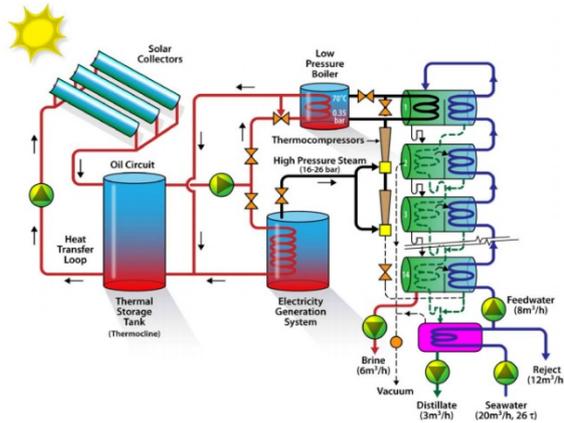


Atomically Precise Catalysts

Enzyme-like, atomically precise catalytic structures can be tailored to the geometries and potential surfaces of reactants for million-fold increases in catalytic activity.

Phase	Title	Institution
I	Atomically Precise Catalysts for the Conversion of Glycerol to High Value Chemical Intermediates	TDA Research, Inc.
I	Hierarchical Zeolite Catalysts for Renewable Surfactants Platform	Sironix Renewables
I	Nitrogenase Inspired Peptide-Functionalized Catalysts for Efficient, Emission-Free Ammonia Production	Proton Energy Systems
I	Design and Synthesis of Bio-inspired Macromolecules Containing Atomically Precise Catalytic Active Sites	Mainstream Engineering Corp.
I	Rational Tailoring of Enzymes Stability and Performance via Polymer-Based Protein Engineering	BioHybrid Solutions

Current SBIR/STIR Projects



Energy – Water Nexus

Advanced systems for desalination, integrated with renewable power, offer innovative approaches to reduce power requirements for sustainable water purification.

Phase	Title	Institution
I	Economical Self-Powered Portable Clean Energy Desalination System	ITN Energy Systems, Inc.
I	Nanophotonics Enhanced Direct Solar Membrane Distillation Process for Desalination of Water	Luna Innovations, Inc
I	Solar Powered Dewvaporation Desalination System	Polestar Technologies, Inc
I	PEM based Vacuum Desalination System	Xergy, Inc.
I	Photothermal Solar Cell	Aquaneers
I	High Efficiency Condenser with Compressor for Multi-Effect Solar Desalination	Savengy Technologies, LLC
I	Renewable Energy Forward Osmosis Desalination System	Hi-Z Technology, Inc
I	Solar Thermal Assisted Vacuum Freezing Desalination of Seawater at the Triple Point	Advanced Cooling Technologies, Inc.

Current SBIR/STIR Projects



Advances in Hydrocarbon Technologies

New technologies for processing hydrocarbons or fostering feedstock and fuel substitution possibilities for natural gas in industry have the potential to provide large gains in energy savings.

Phase	Title	Institution
I	H ₂ Generation from vacuum gas oil (VGO)	TDA
I	Portable Analytical Instrumentation for Instantaneous Real-Time Measurement of Chemical Elements in Raw Petroleum and Refinery Products	Applied Spectra, Inc
I	High efficiency reformer for hydrogen production	Precision Combustion, Inc
I	Advanced Catalysts Development for Oil Refinery	Advanced Energy Materials, LLC
I	Catalysts for Converting Coker Pitch to Liquid Transportation Fuels	OptiFuel Technology, LLC
I	H ₂ Production from Still Gases on Structured Catalysts for Refineries	Nexceris, LLC/ NexTech Mat
I	Cold Plasma Partial Oxidation of Methane to Higher Value Products	Reactive Innovations, LLC
I	High Performance Carbon Materials and Fuels from Cold Plasma Catalysis of Natural Gas	NEI Corporation
I	Low cost modular plasma system for reforming of natural gas	Rivis, Inc.

Current SBIR/STIR Projects

High Selectivity, Industrial Membranes

High performance membranes can provide game-changing process energy advances in chemical separations, desalination, and gas separations.

Phase	Title	Institution
I	Water Filtration Membranes with Built-in Continuous De-Fouling	Global Research & Development, Inc.
I	Polysulfide-Blocking Polymer Membrane Separators for Rechargeable Lithium-Sulfur Batteries	Sepion Technologies
I	Membranes for Highly Selective Separation and Concentration of Gases	Mainstream Engineering Corp.
I	Molecularly Precise Nanoporous Desalination Membranes	TDA Research, Inc.
I	CO ₂ Separation Membrane for Incipient Flue Gas	Luna Innovations, Inc.
I	Development of Scalable Manufacturing Process for High-Selectivity Single-Layer Nanoporous Graphene Membranes	GroWater, Inc.
I	Novel Nanoporous Inorganic Membranes for Energy Efficient Pervaporation Separation	Novoreach Technologies, LLC
I	2D Metal Organic Framework Based Reverse Osmosis Membrane	Physical Sciences, Inc.

Current SBIR/STIR Projects

High Selectivity, Industrial Membranes

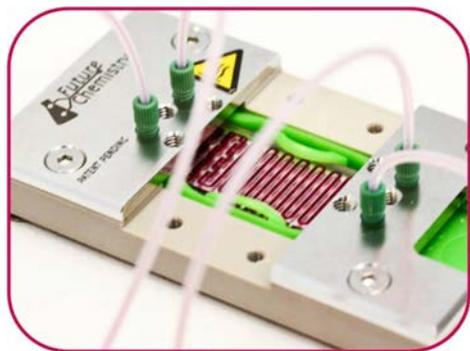
High performance membranes can provide game-changing process energy advances in chemical separations, desalination, and gas separations.



Phase	Title	Institution
I	Novel Zeolite/Polymer Composite Membrane	Techverse, Inc.
I	High Selectivity Gas Separation membrane Assemblies	HiFunda, LLC
I	High Oxygen/Nitrogen Selectivity membrane	Compact Membrane Systems, Inc,
II	Oxygen Separation with Dual Phase Nano-Composite Membranes	Global Research & Development, Inc.
II	Ultra Low Energy, Low Cost Industrial Nanomembrane Manufacturing for Desalination, Water Purification, and Remediation	Covalent
II	Advanced Membrane Technology for Helium Recovery	Helios-NRG, LLC
IIB*	Improved Hydrogen Purification	Compact Membrane Systems, Inc.

* IIB awards allow a grantee to request additional financial support for new R&D tasks and activities that extend beyond the scope of the original Phase II grant.

Current SBIR/STIR Projects

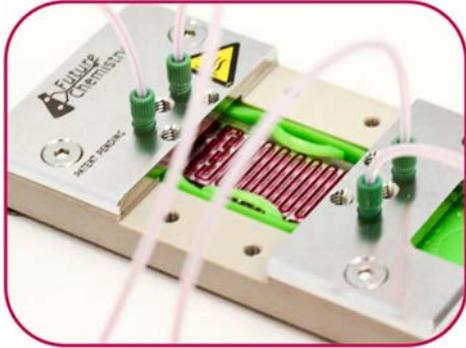


Next Generation Manufacturing Processes

New process technologies can open pathways to increased productivity enabling rapid manufacture of more cost-competitive products. R&D focus areas include reactions and separations, high-temperature processing, and sustainable manufacturing.

Phase	Title	Institution
I	High Efficiency, High Temperature Heat Recuperation for Reduced Plasma Energy Consumption	Advanced Cooling Technologies, Inc.
I	Novel Carbon Fiber Synthesis Process Based on Joule Heating	Vuronyx Technologies
II	Flash Processed Steel for Automotive Applications	SFP Works
II	Membraneless Water Desalination System	Reactive Innovations, Inc.
II	High Ion-Accessible Surface Area CNT-Ultracapacitors for Groundwater Desalination	Mainstream Engineering, Inc.
II	Innovative Process for Production of Neodymium Metal and Neodymium-Iron Master Alloy	Boston Electrometallurgical Corp.
II	Development of On-Site Conical Spiral Welders for Large Wind Turbine Towers	Keystone Tower Systems, Inc.

Current SBIR/STIR Projects



Next Generation Manufacturing Processes (continued)

Phase	Title	Institution
IIB*	Novel Membrane Systems for Olefin/Paraffin Separation	Compact Membrane Systems, Inc.
IIB*	An Industrial Membrane System Suitable for Distributed Used Oil Re-refining	Media & Process Technology, Inc.
II	In-Line Quality and Process Control in Solar and Fuel Cell Manufacturing	Ultrasonic Technologies, Inc.
II	CORE: Capability of Rolling Efficiency for 100m High Speed Rails	OG Technologies, Inc.
II	Single Step Manufacturing of Low Catalyst Loading Electrolyzer MEAs	Proton OnSite
II	Integrated DC-DC Converters Using Thin-Film Magnetic Power Inductors	Ferric Semiconductor, Inc.

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Current SBIR/STIR Projects



Wide Bandgap Power Electronics

Semiconductor and semiconductor products and power electronics based on these semiconductors for improved energy efficiency.

Phase	Title	Institution
I	Development of electrolytic in-process dressing (ELID) grinding of GaN wafers sliced from bulk GaN crystals by ammonothermal growth	SixPoint Materials, Inc.
II	Quantifying Appropriate De-rating of SiC MOSFETs Subject to Cosmic Rays	Monolith Semiconductor, Inc.
II	11B FLAAT Growth Technology for Low-Cost, Thick, High-Quality GaN on 6 inch Sapphire with No Wafer Bow	Kyma Technologies, Inc.
II	Ion Implantation Processes in AlN for Wide Bandgap Semiconductor Power Devices	Adroit Materials

Current SBIR/STIR Projects



Combined Heat & Power (CHP)

Develop, test, and validate advanced CHP and distributed energy systems to pave the way for accelerated deployment in manufacturing and other applications.

Phase	Title	Institution
I	Magnetocaloric Generator for Waste Heat Energy Recovery	Aqwest, LLC