Recipient	In Collaboration with	Location	Project Name	DOE Funds
ZoomEssence, Inc.	• Thermal Tech Engineering • Ion-Apex Electric • Duke Energy • National Starch • Hagelin Flavor	Hebron, KY	No Heat Spray Drying Technology	$750,000
A "no-heat" spray drying process will be developed that eliminates the need for heat by drying to powders in treated air, significantly reducing energy consumption as well as producing more stable, consistent products. This project will focus on key technical challenges to scale-up the prototype dryer to an integrated pilot system.				
Tulane University	• Advanced Polymer Monitoring • Louisiana State University • Louisiana Chemical Association • Nalco Company	New Orleans, LA	Development and Implementation of an Automatic Continuous Online Monitoring and Control Platform for Polymerization Reactions to Sharply Boost Energy and Resource Efficiency in Polymer Manufacturing	$1,500,000
Continuous, online monitoring of polymerization reactions using advanced sensor technology will be integrated with modeling and feedback mechanisms to control polymer reactors, replacing reliance on operator judgment and manual controls, which can be more inefficient and wasteful. Emphasis will be placed on technical challenges to meeting market requirements in order to commercialize the system.				
GE Global Research	• University of Colorado • National Institute of Standards & Technology	Niskayuna, NY	Novel Membranes and Systems for Industrial and Municipal Water Purification and Reuse	$2,000,000
A smooth resin deposition technology will be developed for reverse osmosis membranes used in water treatment and industrial and municipal wastewater reuse. Thin films of the resin will be deposited on standard support membranes to improve performance and significantly improve energy efficiency.				
Doshi & Associates, Inc.	USDA Forest Products Laboratory	Appleton, WI	A Novel Unit Operation to Remove Hydrophobic Contaminants	$316,000
A vacuum air flotation process will be developed to remove pitch and adhesives in paper mill processing to improve energy efficiency, reduce water consumption and reduce sludge production. The technique employs a vacuum system to generate bubbles of air and CO_2 that will float pitch and adhesive particles to the surface where they can be removed inexpensively. The project team will demonstrate batch and continuous prototype systems.				
Purdue University	• Eastman Chemical Company • Dow Chemical • ExxonMobil Research & Engineering	West Lafayette, IN	Development of method and algorithms to identify easily implementable energy-efficient low-cost multicomponent distillation column trains with large energy savings for wide number of separations	$750,000

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A state-of-the-art optimization algorithm is being developed to apply low-energy distillation processes that allow chemical manufacturers to reduce energy consumption between 10% and 50% at their plants. Purdue researchers will team with an IT company to develop a user-friendly interface for the algorithm and to better address software development and commercialization issues. The resulting distillation configuration tool will be demonstrated at multiple industrial partner sites.				
Siluria Technologies	• FIT Consulting • Westlake Chemical corp. • RTI International • HIS Consulting	San Francisco, CA	Low-Energy, Low-Cost Production of Ethylene by Low-Temperature Oxidative Coupling of Methane	$2,000,000
A rapid, automated synthesis and screening technique will be used to develop and optimize catalysts with improved performance for low-energy, low-cost conversion of natural gas to ethylene, an important manufactured chemical. A driver for cost savings is the low-cost natural gas feedstock compared to the conventional technologies that utilize more expensive feedstocks.				
PPG Industries	• Durr Systems, Inc. • North Dakota State University	Allison Park, PA	Coatings and Process Development Reduced Energy Automotive OEM Manufacturing	$3,000,000
A monocoat paint process and coating process for automotive assembly will be designed and developed to replace the current basecoat and clearcoat processes in assembly plant paint shops. The proposed technology may also allow automakers to meet fuel-economy standards in the future by incorporating lightweight composites in their automotive designs as many lightweight composites cannot withstand the cure temperatures required by today's coating processes.				
GrafTech International Holdings, Inc.	• Oak Ridge National Laboratory • National Composites Center • Mascoma Corporation • Plasan Carbon Composites	Parma, OH	Low-Cost Bio-Based Carbon Fiber for High Temperature Processing	$4,500,000
As a viable alternative to petroleum-based carbon fibers produced overseas, low-cost carbon fibers made from biomass will be developed and evaluated for use in thermal insulation, such as that used in for high temperature furnaces used to manufacture solar panel components.				
The Boeing Company	• Ford Motor Co. • Ajax TOCCO • TEMPER, Inc. • Cytec Engineered Materials • Vestas • Steeplechase Tool and Die	Seattle, WA	Energy Efficient Thermoplastic Composite Manufacturing	$4,500,000
Large scale, integrated composites for aerospace applications will be produced and validated using a high speed manufacturing process as compared to the current autoclave process. The process utilizes induction heating to rapidly heat the material only where needed, applying pressure for consolidation and then rapidly cooling the part to achieve maximum stability. This induction heating approach will also be tested				

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as a joining technique to enable the incorporation of components into the overall part assembly.				
Easel Biotechnologies, LLC	• Eastman Chemical Company	Los Angeles, CA	Bio-Oxo Technology	$2,000,000
Metabolically engineered bacteria will be used to convert renewable biomass resources to isobutyraldehyde, an important chemical intermediate used in the production of surface coatings and adhesives, lube oil additives, surfactants, among other products currently made from petroleum feedstocks. The project is a first step in a pathway to pilot scale demonstration incorporating an integrated fermentation and separation design.				
Aerojet Rocketdyne, Inc. (formerly Pratt & Whitney Rocketdyne)	• EERC • NETL ORD • Janike & Johanson	Canoga Park, CA	One Step Hydrogen Generation through Sorption Enhanced Reforming	$750,000
This project will demonstrate a one-step hydrogen production process exhibiting substantial energy benefits compared with the conventional hydrogen production method. Researchers will conduct studies to optimize performance while soliciting interest among companies in adopting the process.				
United Technologies Research Center	• University of Akron	East Hartford, CT	High Thermal Conductivity Polymer Composites for Low Cost Heat Exchangers	$750,000
To speed the development of plastic heat exchangers, researchers will create a database of selected properties for thermally conductive plastics. Heat exchangers manufactured from polymer composites would have several advantages over metal heat exchangers, including lower weight, improved corrosion resistance, increased manufacturing energy productivity and lower greenhouse gas emissions.				