OPEN+ High Temperature Devices Cohort

PROJECT DESCRIPTIONS

Brayton Energy – Hampton, NH

Efficient and Low-Cost Brayton Cycle for Residential and Remote Power Applications – $1,000,000

Brayton Energy is developing an efficient and low-cost residential-scale combined heat and power system. This project seeks to advance and then combine several complementary technologies—including metallic screw compressors, high temperature ceramic screw expanders, and a high-effectiveness recuperator. This combination will result in an integrated system with performance surpassing state-of-the-art systems. Brayton Energy's proposed technology would continuously deliver 2 kW of electrical power and enable efficient and economical distributed power systems that would radically transform how we heat and cool our homes, charge our growing electric vehicle fleet, and more.

Creare, LLC – Hanover, NH

Closed-Loop 5-kWe Brayton-Cycle Microturbine with 38% Efficiency: Advanced Generator Technology Designed for Inexpensive Mass Production – $2,999,901

Creare, in partnership with IMBY Energy, is developing a mass-manufacturable, closed-loop, Brayton-cycle microturbine that will provide 5 kW electrical power for residential and commercial buildings. The waste heat from the device can be harvested for residential heating. The proposed technology can potentially convert a variety of fuels to electricity more efficiently than incumbent technologies while targeting a product cost of $800/kW electrical power and a 20-year lifetime. If successful, Creare's system would reduce residential primary energy consumption, enhance alternative fuel use, improve electric grid operation, and stimulate domestic manufacturing.

Pennsylvania State University – University Park, PA

Integration of Sensors through Additive Manufacturing Leading to Increased Efficiencies of Gas Turbines for Power Generation and Propulsion – $4,703,906

Pennsylvania State University is developing a novel manufacturing process that prints integrated sensors into complex systems such as gas turbines for real time monitoring. These durable, integrated sensors would provide critical knowledge of key operating conditions such as temperature of key components. These sensors enable the unique possibility to gain direct knowledge of critical parameters that are currently only inferred. This innovation—developed in partnership with Georgia Institute of Technology, CVD MesoScribe Technologies Corporation, Siemens, and United Technologies Corporation—will enable condition-based maintenance and find use in myriad applications, from energy production to aircraft propulsion.