

**Development of a Microchannel High Temperature Recuperator
for Fuel Cell Systems**

FuelCell Energy, Inc.

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This poster describes a DOE-funded program (Contract DE-EE0001111) to advance the Solid Oxide Fuel Cell (SOFC) systems technology toward higher performance and lower cost via the development and optimal use of microchannel high temperature recuperators (HTR's). This ITP (Industrial Technologies Program) project, administered by NETL, is focused on microchannel HTR's that recover waste heat from high temperature solid oxide and carbonate fuel cell systems. The pathway for this three year project encompasses a range of R&D activities from materials screening and testing to multi-kW scale device fabrication and testing to design of MW-scale commercial recuperators.

The project includes an expert team of participants including FuelCell Energy, Inc. (FCE), Pacific Northwest National Laboratory (PNNL), and Oregon State University (OSU). The objective of the project is the development of cost effective and durable high temperature recuperators which are suitable for SOFC/GT hybrid systems. In response to the ever-growing market demand for ultra-high efficiency power generation systems, FCE has developed a unique concept for a combined cycle system comprised of the fuel cells and heat engines (gas turbines). The poster presentation will describe the key technical barriers such as material and manufacturing costs as well as device scale-up issues. Project milestones and technology benefits will be outlined. The poster will also provide a compilation of background microchannel and fuel cell/turbine combined cycle system technology as well as project technical results accomplished thus far.