



**FuelCell Energy**

World Leader in Ultra-Clean Power

## **Thrust Area: SOFC**

### **Summary**

**FuelCell Energy (FCE)** has been involved in the development of high temperature ( $>600^{\circ}\text{C}$ ) fuel cells for over 30 years and is currently engaged in commercial deployment of its DFC<sup>TM</sup> products in the sub-MW to multi-MW size range based on its carbonate fuel cell technology. Consistent with its mission as a high temperature fuel cell company, FCE is also engaged in solid oxide fuel cell (SOFC) power plant development with operating temperatures between  $700^{\circ}\text{C}$  and  $1000^{\circ}\text{C}$ , as a future product option that may enhance FCE's high temperature fuel cell product portfolio.

FCE is working with the United States Department of Energy (DOE) through a cooperative agreement with the National Energy Technology Laboratory (NETL) to develop a cost competitive, multi-MW, Coal-Based Solid Oxide Fuel Cell (SOFC) Power Plant with near zero emissions. Program objectives include developing a MW class SOFC power unit and balance-of-plant system to operate on coal-based synthesized gas while sequestering  $>90\%$  carbon. The program also seeks to optimize plant design and develop advanced SOFC technologies for higher efficiencies and reduced costs. FCE uses the cell and stack design of their SOFC technology partner, **Versa Power Systems Inc (VPS)** for all its SOFC programs. Other team members of the FCE Coal-Based program team include:

- **Gas Technology Institute (GTI)**
- **Pacific Northwest National Laboratory (PNNL)**
- **WorleyParsons Group, Inc.**
- **SatCon Power Systems, Inc.**
- **Nexant, Inc.**

The SECA program was established to promote the development of environmentally friendly, cost competitive SOFCs for a variety of energy needs, including clean, coal-fueled large central power generation stations. This project was established to prove that efficient and environmentally friendly fuel cell technology is the best way to reduce emissions from future central generation power plants and reduction of global warming. This technology is also seen as a critical part of the solution to the US dependence on foreign fuel sources. The DOE anticipates commissioning multi-MW, proof-of-concept, coal-based SOFC power plant systems in the 2012 time frame. FCE forms one of only three industrial teams competitively chosen by DOE to develop this technology for large-scale, coal-fueled applications. GE Hybrid Power Generation Systems and Siemens Power Generation, Inc. are the other two DOE-selected industrial teams. The DOE tapped FuelCell Energy, in part, for its experience in coal gas systems, its existing work with fuel cell hybrid power plants, and its record in building megawatt-class systems.