Pacific Northwest
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PNNL-32490

FCET Solid Oxide Fuel Cell Testing and Development

CRADA 526 (PNNL 79117)

November 2021

Brent Kirby

Fuel Cell Enabling Technologies, Inc. (FCET)

U.S. DEPARTMENT OF ENERGY

Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

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Abstract

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Pacific Northwest National Laboratory
Richland, Washington 99354

Abstract

The purpose of the proposed project is for PNNL to test the performance of prototype solid oxide fuel cells (SOFCs) created by FCET. Such testing will provide FCET with independent performance data that can be communicated to potential clients and/or investors. Additionally, PNNL will collaborate with FCET on design changes to improve fuel cell performance. Intellectual property developed in this way will benefit FCET with improved products to market, and PNNL through royalty revenue.

The key technology held by FCET is a process to deposit extremely thin layers of oxide materials, from 10-50 nm in thickness. The range of possible materials that can be deposited with their method is broad, but this project will focus on the yttria-stabilized zirconia (YSZ) electrolytes for SOFCs. Thin, gas tight YSZ membranes have been a long-sought target in SOFC research. The thinner the YSZ, the lower the cell resistance, and the higher performance of the cell (or the lower the operating temperature). 10-50 nm would be a major step change in YSZ thickness from the state of the art. PNNL can team with FCET on future R&D projects and push this technology forward to improve energy efficiency and reduce carbon emissions.

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