DISCLAIMER

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Ion-Pair Proton Exchange Membrane Fuel Cells for Heavy-duty Transportation

K. Sasaki

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Strategic Partnerships Office

Brookhaven National Laboratory

U.S. Department of Energy

CRADA - Work for Others (WFO)

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CRADA ABSTRACT

CRADA # C-24-13

BETWEEN

BROOKHAVEN SCIENCE ASSOCIATES, LLC

AND

ADVENT TECHNOLOGIES, INC.

Brookhaven PI: Kotaro Sasaki

Technology Area: Chemistry

Project Title: Ion-Pair Proton Exchange Membrane Fuel Cells for Heavy-duty Transportation

Summary/OSTI Abstract:

The purpose of this project is to build a fuel cell prototype that demonstrates high temperature proton exchange membrane fuel cell technology (HT PEMFC) commercial readiness. It advances from a technology baseline established in a prior CRADA in which these same Parties collaborated during the years 2020-2024. These efforts are aligned with the intentions of the DOE Hydrogen Fuel Cell Technology Office (HFTO) L'Innovator Pilot Program. Participant observes that its US-based competitive advantage may be improved by further optimizing Laboratory inventions.

This CRADA is intended to further improve National Laboratory compositions and to develop commercial HT PEMFC membrane electrode assemblies (MEAs) that perform over a range of operating temperatures and relative humidity, that generate power from both low grade and pure hydrogen, and that are resistant to air impurities. Participant's goal is to advance the commercial competitiveness of National Laboratory technologies in fuel cell products for heavy-duty truck integrators, for stationary power generation, marine applications, and for emerging interest from commercial aviation.

The Parties will collaborate on producing a HT PEMFC MEA that integrates LANL ion pair technology and Brookhaven catalyst technology. The Laboratories plan to research and develop compositions for testing and evaluation. The participant will manufacture multiple MEAs based on the Laboratory compositions and will enable selected customers to validate performance characteristics. The Laboratories will convey to Participant the methods of making the National Laboratory compositions such that Participant may reproduce and then scale Laboratory methods into commercial production. Throughout the project, the Laboratories and Participant will iteratively test and optimize the compositions of materials of the MEAs, intending to optimize characteristics such as power density and lifecycle durability. Participant's intended customers include fuel cells for large trucks, aviation, power back up, marine, and portable power.