

NREL teams with industry to validate methanol fuel cell technology

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The U.S. Department of Energy's National Renewable Energy Laboratory (NREL) is collaborating with Oorja Protonics of Fremont, Calif., on a two-year project to deploy and demonstrate methanol fuel cells for power pallet jacks, a kind of forklift, in four commercial wholesale distribution centers.

The total cost of the project is just over \$2 million; NREL will contribute \$900,000 to fund the project and Oorja will provide \$1.2 million. NREL will collect and analyze data from the deployment project and will provide a third-party assessment of the performance of these emerging methanol <u>fuel cell</u> technologies in material handling applications. Using data from this project, NREL expects to help industry understand the business case for using methanol-fueled fuel cells in material handling applications.

During the course of the technology validation project, 75 direct methanol fuel cell (DMFC) power packs will provide power to Class III material handling lifts at warehouses operated by Unified Grocers (Stockton, Calif., and Commerce, Calif.), Earp Distribution (Kansas City, Kan.), and Testa Produce (Chicago). The fuel cell-powered lifts will use renewable bio-methanol, an organically derived fuel made from crude glycerin resulting from vegetable oil and animal fat processing. Methanol offers high fuel density and low fuel and fueling infrastructure costs.

"The deployment project offers a significant opportunity to increase the



number of commercially available DMFC systems, expand practical user operating experiences, and validate the performance of the systems using real-world data," said NREL Project Manager Todd Ramsden.

Fuel cell-powered lifts offer longer runtimes and increased autonomy compared to traditional battery-powered lifts. Fuel cell-powered material handling equipment eliminates the need for battery swapping and electrical demand associated with traditional battery lifts. By eliminating time-consuming battery changes, fuel cell lifts can increase overall distribution center productivity. Eliminating electric grid based battery charging also reduces greenhouse gas emissions. By operating on renewable <u>methanol</u> delivered to warehouse sites, the fuel cell-powered lifts used in this deployment project are expected to reduce net carbon dioxide emissions by 1 million pounds over the course of the project.

"Hydrogen-powered fuel cell material handling equipment has emerged as one of the fastest-growing applications for hydrogen fuel cells," said Ramsden. "DMFCs hold promise to deliver many of the same operational benefits of hydrogen-powered fuel cell material handling equipment, including long runtimes, short refueling times, and increased productivity."

Provided by National Renewable Energy Laboratory

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