


DOE Hydrogen and Fuel Cells Program Record		
Record #: 11017	Date: 04/06/2012	
Title: Industry Deployed Fuel Cell Powered Lift Trucks		
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Item:

Table 1: Number of fuel cell deployments (current and planned) for applications in material handling equipment (MHE).

	DOE Funded¹ (ARRA) as of 12/2011	DOE Funded^{2,3} (Appropriations) as of 10/2011	DOE Total	Industry Funded or on Order (U.S.)³⁻⁶ From 2009 – Record Date	DOE and Industry Total From 2009 – Record Date
Number of MHE Deployments (current & planned)	504	189	693	3,536	4,229

Successful U.S. Department of Energy (DOE) projects have led to over 3,500 fuel cell lift truck industry installation and on order units with no DOE funding.

Data/Assumptions/Calculations:

Total DOE American Recovery and Reinvestment Act (ARRA) investment for these fuel cell powered lift trucks is about \$9.7M, with an industry cost share of \$11.8M.ⁱ The DOE Fuel Cell Technologies (FCT) Program had estimated that the first 400 fuel cell powered lift trucks deployed with DOE cost share led to >3,000 orders/deployments with no DOE funding. As industry continues to place orders and deploy units, DOE will revise its records and determine actual orders filled/units commissioned as a result of DOE (Market Transformation and ARRA projects).

ⁱ ARRA funding supported deployments in MHE for: FedEx Freight East; GENCO with deployments at Coca Cola, Kimberly Clark, Sysco Philadelphia, Wegmans, and Whole Foods Market; Nuvera Fuel Cells with deployments at H-E-B Grocery; and Sysco Houston. Funds included units as well as other aspects of the projects such as infrastructure, training, installation, data collection, analysis, and reporting.

The manufacturers providing the fuel cells for the deployments (current and planned) mentioned in Table 1 are:

Ballard Power Systems	Oorja Protonics
Hydrogenics	Plug Power, Inc.
Nuvera Fuel Cells	

Plug Power by the end of Q4 2011, received a total of 2,503 unit orders outside of DOE funding.⁴ To date, other manufacturers report supplying or planning to supply 230 fuel cells.³ This is based on discussions with fuel cell Original Equipment Manufacturers (OEMs) as well as public references. As of March 2012, examples of companies that have purchased or committed to purchasing fuel cell powered lift trucks are as follows:

Ace Hardware	GM	Nissan North America
Baldor Specialty Foods	Golden State Foods	Ozburn-Hessey Logistics
BMW Manufacturing Co.	ISOLA Laminates	PBR
Bridgestone-Firestone	Kimberly-Clark/GENCO	Sysco Foods
Central Grocers	Kroger Co.	Testa Produce
Coca-Cola	Leigh Fibers	United Natural Foods, Inc. (UNFI)
EARP Distribution	Martin-Brower	U.S. Foodservice
East Penn Manufacturing	Michelin	Walmart
FedEx Freight	Nestle Waters	WinCo Foods, LLC

Based on OEM feedback, it was determined that their purchase orders for deployments were considered either directly or indirectly due to results of the DOE FCT Program. This includes both Market Transformation and ARRA deployment funding. In some instances, companies increased the number of purchases beyond those with DOE funds assistance. In other instances, the OEMs were able to show the business case using data collected from DOE projects and obtained purchase orders with no DOE funding. The list includes only companies known where deployments can be traced to DOE FCT Program involvement.

Reference(s):

1. “MHE Units Deployed by Class: ARRA”, National Renewable Energy Laboratory, December 2011: http://www.nrel.gov/hydrogen/cfm/images/cdparra_mhe_01_unitsdeployed.jpg and http://www.nrel.gov/hydrogen/proj_fc_market_demo.html
2. “Beyond Demonstration: The Role of Fuel Cells in DoD’s Energy Strategy”, LMI 2011: http://www.dlafuelcells.org/wp-content/uploads/2011/10/DoD-Fuel-Cell_10-19-11.pdf
3. Fuel Cells 2000, “State of the States: Fuel Cells in America”, June 2011, Appendix 3 – “Fuel Cell-Powered Forklifts in North America”: <http://www.fuelcells.org/wp-content/uploads/2012/02/2011-State-of-States-July-2011-update.pdf>
4. “Plug Power Announces Fourth Quarter and Year-End 2011 Financial Results”, March 2012: http://www.plugpower.com/news/pressreleases/12-03-08/PLUG_POWER_ANNOUNCES_FOURTH_QUARTER_AND_YEAR-END_2011_FINANCIAL_RESULTS.aspx
5. “Why Plug Power Could Double”, March 2012: http://seekingalpha.com/article/428301-why-plug-power-could-double?source=email_investing_ideas&ifp=0
6. “Baldor Powers Forklifts through Fuel Cells”, November 2011: <http://www.thepacker.com/fruit-vegetable-news/133487138.html>