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E-NEWSLETTER
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Fuel Cell Forklift Fleets – Catching on in a Big Way

By Sandra Curtin, Research Director, Fuel Cells 2000
Coca-Cola, Walmart, Whole Foods, and other nationally recognizable companies have discovered the substantial benefits provided by deploying fuel cell power in their materials handling fleets. These firms report saving tens of thousands of dollars in labor costs and hundreds of thousands in electricity costs annually, while also reducing carbon emissions by hundreds of metric tons each year. Sixteen of these companies, including seven in the Fortune 500, are profiled in Fuel Cell 2000's new report, "The Business Case for Fuel Cells: Why Top Companies Are Purchasing Fuel Cells Today."

Why fuel cells?

"The cost and productivity savings that we have gained have been so significant that we have already converted a large number of our material handling vehicles, even in this economy. As OorjaPac takes less than one minute to refuel and supplies enough power for an entire shift, this greatly impacts our 24/7, 365-day operation." Tom Hughes, Warehouse Manager, Super Store Industries

"With these fuel cell materials handling units, we will be able to maintain productivity, decrease operating costs and lower greenhouse gas emissions by 30%. We assessed many different technologies for our materials handling fleet and believe the Plug Power fuel cell units give us the best overall solution." Lauren C. Steele, Spokesman, Coca-Cola Consolidated

The materials handling market is one area where fuel cells are taking off at a rapid pace, with more than 1,000 fuel cell forklifts already deployed or planned in the coming year. A federal jobs program has helped, but there is also a strong business case. Fuel cell forklifts are proving to be cost-
effective, providing gains in productivity, and substantial savings in electricity, labor, insurance costs, and staff hours, as well as significant reductions in carbon emissions.

Several studies support these findings. Argonne National Laboratory estimates that fuel cell lift trucks produce 63 percent fewer greenhouse gas emissions than battery-powered systems, while Battelle indicates that fuel cell forklifts on a lifecycle cost basis require approximately 48 to 50 percent less investment than battery-powered competitors in high-throughput applications. Battelle also found that while fuel cell-powered forklifts require a greater initial investment they provide significant savings in operation and maintenance.

One customer of fuel cell manufacturer Plug Power estimates a potential savings of $200,000 - $250,000 per year on each fuel cell-powered forklift. Bill Ryan, the vice president and general manager of the material handling division of LiftOne, a division of Carolina Tractor and a material handling dealership, states that the cost of maintaining a fuel cell-powered forklift is about half that of battery forklifts, saving a high-volume location 15% annually.

Productivity and storage space are at a premium in warehouses and distribution centers. Batteries take up a lot of storage room while typically providing up to six hours of run time. Fuel cells last more than twice as long (12-14 hours) and eliminate the need for battery storage and changing rooms, leaving more warehouse space for products. The greatly reduced fueling times – one to two minutes, compared to 20-30 minutes or more for each battery swap - saves the forklift operator valuable time, reduces labor costs and increases warehouse efficiency.

Fuel cells deliver constant power and performance, eliminating the reduction in voltage output that occurs as batteries discharge. Fuel cells also eliminate the numerous interruptions in current input and output that electric forklifts experience due to frequent starting and stopping during use.

**Well known companies are deploying fuel cells**

Fuel cell forklifts were deployed at several well known companies in 2009.

1. **Bridgestone-Firestone** replaced its battery-powered forklift fleet with fuel cell-powered units at the company's South Carolina manufacturing plant.

2. **Nestlé Waters** replaced its entire sit-down counterbalanced lift truck fleet at its Dallas bottling facility with a new fleet of 32 fuel cell lift trucks.

3. **Grocer H-E-B** placed 14 fuel cell reach trucks in service at their San Antonio perishables distribution center.

4. **Super Store Industries** has installed fuel cells on the entire materials handling fleet operating in the freezer of its Lathrop, California facility.

5. **Nissan North America** is leasing 60 fuel cells to power forklifts at its Smyrna, Tennessee assembly plant.

The pace picked up in 2010, with purchases announced by 11 major U.S. companies. The Department of Energy supported six purchases through the American Recovery and Reinvestment Act, accounting for about 40 percent of the purchases. **FedEx Freight East** is deploying 35 fuel cell systems as battery replacements for a complete fleet of electric lift trucks at its Springfield, Missouri, service center, with funding for the purchase provided through the federal Recovery Act. The company says that success of the Missouri deployment may lead to fuel cell fleet conversions at FedEx's other service centers. FedEx had earlier demonstrated fuel cell-powered forklifts at its Vancouver International Airport logistics hub.
Logistics service provider, GENDO, was awarded Recovery Act funding to deploy over 350 fuel cell systems as battery replacements for fleets of electric lift trucks at five of GENDO’s distribution centers: Coca-Cola in Charlotte, North Carolina; Kimberly-Clark in Graniteville, South Carolina; Wegmans in Pottsville, Pennsylvania; Whole Foods in Landover, Maryland; and Sysco Foods in Philadelphia, Pennsylvania. Sysco received a separate Recovery Act award for its new Houston site, where the company is deploying an all-fuel cell fleet, and estimates quarterly savings of $24,000 on labor costs that would have been associated with changing out lead-acid batteries during each shift change. The company is also currently testing fuel cell pallet trucks at a Vancouver location, and has trialed more than three dozen fuel cell pallet trucks at two of its Michigan sites. Sysco is considering additional fuel cell conversions at some or all of the company’s 169 distribution centers.

Many other companies made purchases independent of Recovery Act support. United Natural Foods, Inc. (UNFI) created an all-fuel cell materials handling fleet at its Sarasota, Florida, distribution center, adding 29 new fuel cell lift trucks and retrofitting fuel cells onto 36 of its existing lift trucks. The company expects to attain annual energy savings of approximately 640,000 kilowatt-hours (kWh), while reducing carbon emissions by about 132 million tons annually.

Martin-Brower and U.S. Foodservice purchased fuel cells for their California food distribution facilities. U.S. Foodservice expects to save 620,000 kWh annually and reduce carbon emissions by 540,000 pounds by retrofitting fuel cells onto pallet jacks at their San Francisco-area facility, while Martin-Brower’s 15 fuel cell forklifts should reduce power demand by about 338 million watts per hour and reduce carbon emissions by over one million pounds per year at their Stockton distribution center. Martin-Brower expects that the fuel cells will pay back on investment in less than 11 months.

A key advantage of fuel cell-powered forklifts is the ability to operate reliably at sub-zero temperatures, allowing them to be used with great success in refrigerator and freezer facilities. In 2010, Central Grocers, Super Store Industries, Sysco and Walmart purchased fuel cell forklifts for this application. In fact, Walmart Canada’s new Balzac, Alberta, sustainable refrigerated distribution center will have a forklift fleet powered entirely by fuel cells and estimates that its 72-unit fuel cell fleet will reduce greenhouse gases by 1.2 million pounds and save the company $2 million in operating costs over seven years. This will be Walmart’s fifth site to use fuel cell forklifts.

Fuel cell manufacturers
Several manufacturers are producing specialized fuel cell products for the materials handling market. **Plug Power** offers the GenDrive fuel cell for sit-down counterbalanced trucks (Class 1), stand-up reach trucks (Class 2) and rider pallet trucks (Class 3). **Hydrogenics** manufactures "plug and play" HyPXTM Fuel Cell Power Packs to fit popular makes of new and used counterbalanced and lift trucks with no modifications, including class 1 counterbalanced trucks and class 2 reach trucks. **Nuvera** offers the PowerEdge, a hybrid system consisting of a fuel cell power system, sealed, maintenance-free batteries, a compressed hydrogen storage system, and counterweight for counterbalanced trucks and reach trucks. German manufacturer, **Proton Motor Fuel Cell**, also offers their PM Package MH 30 for forklifts. All use hydrogen fuel.

**Oorja Protonics’ OorjaPac** is a methanol-fueled fuel cell that continuously trickle-charges an onboard battery while the unit is in operation or parked, ensuring that the battery never reaches a state of deep discharge and preventing heat damage caused during battery recharges.

**Are fuel cells in your future?**

Given the popularity of fuel cell power for forklifts and the unique benefits provided, continued growth in fuel cell forklift sales is expected in 2011. Several companies have deployed fuel cells at multiple sites, with some - like Whole Foods, Coca-Cola and Walmart - deploying fuel cell combined heat and power units to deliver electricity, heat, hot water and cooling to their retail sites and production sites. Fuel cells make sense - reducing emissions, energy use and improving the bottom line - and are catching on in a big way.

Click here to download and view the full report from FuelCells.org (PDF).

**Cat Lift Trucks Announces First Delivery of New Internal Combustion Pneumatic Tire Series**

Cat Lift Trucks, a provider of lift trucks known for quality, reliability and customer service, announced today the delivery of the first new P8000-P12000 / PD8000-PD12000 series of internal combustion pneumatic tire lift trucks to the Columbian TecTank manufacturing facility in Parsons, Kansas.

A global leader in the design, manufacturing and installation of factory coated storage tank systems, Columbian TecTank will use the new trucks to move carbon and stainless steel products throughout their 250,000-square-foot facility. After a thorough search for a product that would enhance productivity and decrease operating costs, Columbian TecTank concluded that the P8000-P12000 / PD8000-

PD12000 series would best fit their business needs.

"We are excited to be the first in the country to receive this new series of Cat® lift trucks," said Steve Allen, director of operations, Columbian TecTank. "The new Cat lift trucks will allow us to provide ..."
quality products to our customers and a more efficient workplace for our employees."

The new series is just one of five new families of Cat lift trucks announced earlier this year and is equipped with standard high-performance features such as an EPA-compliant purePOWER® engine, two speed forward and one speed reverse transmission and an LED/LCD display panel, which features such tools as an operator passcode system and maintenance interval reminders.

"This new line of internal combustion pneumatic tire lift trucks reflects significant advances in the development of our products and enhances the array of models available to our customers," said Jeff Rufener, vice president of marketing, Cat Lift Trucks. "Our mission is to continue to produce equipment that will provide our customers with the best in operator comfort and control for improved productivity. We make durable and hard-working equipment, and we are proud to say that these lift trucks set new standards for us and the lift truck industry."

View more about Columbian TecTank's outlook on how the new P8000-P12000 / PD8000-PD12000 series will help their business at http://www.facebook.com/catliftruck.

About Cat Lift Trucks: Cat Lift Trucks offers reliable lift trucks backed by industry-leading customer service and support through one of the most extensive dealer networks in North, Central and South America. With capacities ranging from 2,500 to 36,000 pounds, the company is recognized for its solutions-oriented and durable line of material handling equipment for commercial and industrial applications. Cat® lift trucks are manufactured and distributed by Mitsubishi Caterpillar Forklift America Inc. (MCFA), a leading manufacturer of forklifts in the United States, Mexico, Canada and Latin America. For more information on Cat Lift Trucks, visit http://www.cat-lift.com, call 1-800-CAT-LIFT or become a fan on Facebook (http://www.facebook.com/catlifttrucks).

Curtis Introduces New PathPro Soft Cab for Yamaha Rhino and Polaris Ranger

Curtis Industries, LLC has added to its line of quality enclosures, the new PathPro soft cab system for the Yamaha Rhino and Polaris Ranger that easily mounts to the factory installed Operator Protection System (OPS). This PathPro enclosure, keeps you and your passenger out of the elements, for a fraction of the cost.