

United Natural Foods, Inc. (UNFI) distributes more than 60,000 products to more than 17,000 customer locations nationwide. It provides natural and organic products to a wide variety of retail establishments including supermarket chains, natural food superstores and independent retail operators. UNFI Sarasota operates its 325,000 square foot distribution center almost non-stop 24-hours a day, 360 plus days a year.

The Power Players

Lisa Madsen

Director of Sustainability and Philanthropy
Organizes and executes sustainability and philanthropic initiatives across the UNFI organization

Mike Garstka

Operations Manager for UNFI's Sarasota distribution center
Oversees all shipping, receiving and site operations



Class-3 pallet jacks fitted with GenDrive units at the UNFI Sarasota facility

The Situation

UNFI was looking for the next level in environmentally conscious projects for the organization. They reviewed renewable energy sources including methanol fuel cells before learning about the benefits of hydrogen fuel cells. They knew they would need to retrofit an existing facility and its equipment and were careful in their consideration of a test site. The Sarasota distribution center was the optimal location. The facility was only three years old and had newer infrastructure that could be easily adapted.

Additionally, the State of Florida made the process much easier because it provides tax incentives to companies that implement alternative energy sources. In December 2009, UNFI purchased 65 GenDrive® fuel cells from Plug Power Inc., the leader in clean, reliable fuel cell energy solutions.



Class-2 lift trucks retrofitted with GenDrive fuel cells

Power Ahead

“The prospect of going to a fuel cell versus the traditional lead-acid battery was appealing because it is sustainable and fits well with UNFI’s core values as a company delivering natural products to our customers,” said Mike Garstka. “Additionally, it allowed us to eliminate the typical two to three battery changes per shift that would each take equipment operators between 12 and 30 minutes to complete before they could get back on the floor.”

UNFI Sarasota has been using the Plug Power GenDrive fuel cells since August 2010. They added 29 new lift trucks to the Sarasota fleet and retrofitted 36 existing lift trucks to run via the GenDrive power units. In the short timeframe since deployment, UNFI has seen significant productivity gains as a result of switching from lead-acid batteries and is closely tracking its sustainability gains.

“This initiative supports our corporate strategy and our promise to customers. It makes sense for us,” said Lisa Madsen. “Our associates rallied around the environmental cause. This roll out is further evidence that we are committed to sustainability. It gives us a sense of pride and satisfaction.”

The Hydrogen Advantage for Distribution Center Management

“When I was first approached with the idea of moving to hydrogen fuel cells, I was skeptical,” said Garstka. “After I did the research and discovered that we had sought out the greenest and cleanest option, it was a clear decision to make because there is not another technology on the market today which meets that standard.”

In fact, for the UNFI Sarasota facility, projections indicate that it will reduce its carbon emissions by 132 metric tons annually, an amount equivalent to the annual emissions of 35 automobiles.

Even with the need to retrofit existing equipment, the transition away from lead-acid batteries has been smooth. UNFI called upon The Raymond Corporation, who served as a beneficial partner because they already knew the facility’s business, workflow and processes. Madsen said, “They were familiar with our needs and knew how to help us optimize fleet downtime. By planning ahead we were able to ensure a successful rollout strategy.”

In order to retrofit the lift equipment for fuel cell placement, the lead-acid battery support casters needed to be removed. By doing this, the GenDrive fuel cell units fit securely into the compartment, eliminating any jostling. The process took about 20 minutes per unit and then the truck was ready for immediate use. There were no adjustments necessary for electric pulse or wiring.

“Naturally someone would be concerned with the changeover—equipment downtime, training and interruption to the daily functions. There was nothing in our process that was a detriment to the facility,” said Garstka. “During the transition, we would rotate the units. Operators would drop off lead-acid battery driven trucks and pick up newly-fitted fuel cell-powered equipment. We looked into options for retrofitting the equipment off-site and using rentals during the process; however, we found that the conversion to GenDrive was so easy that we could do it on-site between and during shifts.”

Productivity gains have been substantial since the switch to GenDrive fuel cells. Garstka said,

“We have seen positive results since the implementation of GenDrive. Operators are consistently in the aisles moving product throughout the duration of their 10-12 hour shifts.”

“Our analysis of productivity gains for our 160 associates over a six-week period indicate that lead-acid batteries would cost an average of \$1,900 - \$3,000 in lost time per week,” said Garstka. “On the other hand, we estimate that the GenDrive hydrogen fuel cells only result in an average of about \$176 per week in lost time. Based on these estimates, we project a savings of \$146,000 annually in manpower.

Additionally, the ability for the GenDrive fuel cells to retain their power through the entire shift has been the most rewarding thing. “There is no droop like there is with lead-acid batteries. The experience is very similar to that of a car. You have the same power in your vehicle regardless of the amount of fuel in the tank. With lead-acid batteries, performance degrades as it loses charge. The GenDrive fuel cells, on the other hand, provide consistent power throughout the shift.”

“The operators in the freezers and coolers love that they have full power over their equipment in lower temperatures,” said Madsen. “They do not need to leave the cold storage areas to change out their batteries. They can stay in their gear and refuel at hydrogen stations located in the coolers.”

The Hydrogen Advantage for Equipment Operators

With hydrogen, UNFI Sarasota was able to move to a process where operators could refuel on their own without the help of a technician. The fuel cell typically

takes two to three minutes to refuel, but worst case, in the biggest pickers and lifts, it could take eight minutes to fill a completely empty fuel cell.

“Compare this with lead-acid batteries where the equipment operator would need to find a technician to switch the battery. They would then both need to suit up in personal protective equipment (PPE) per safety requirements,” said Garstka. “The technician would assess the battery inventory, find the appropriate fully-charged replacement and make a switch. It was a lengthy process anywhere from 12 to 30 minutes that was typically needed two or three times per shift to allow people to do their jobs and stay productive. If there was a line of operators waiting for a technician, it would take even longer. Now, operators can do everything on their own. They stop, refuel and keep going. There is no waiting around. With GenDrive fuel cells, we operate at the same power level from the first task to the last. It gives the operators the opportunity to be extremely productive.”

There were some that were skeptical about the technology and concerned about safety. UNFI adopted very strict safety measures to allay these fears. Trainers and instructors from Plug Power, The Raymond Corporation and Air Products, hydrogen provider for the UNFI site, provided hands-on instruction and information. “The GenDrive fuel cells are easier and cleaner and we expected this to be the case,” said Garstka. “However, we had no idea how easy it would really be. It does not even compare to the old process.”

In order to use the Air Product’s fueling station, everyone needed to be trained and certified on the equipment. Operators refuel by swiping an access card. Garstka said, “By using the cards we know who is refueling and it ensures that people who are not certified cannot refuel the units. This helps make the overall operation safer.”

Why Plug Power & Hydrogen Fuel Cells

UNFI felt that having hydrogen on-site was a better option than having to manufacture methanol for the methanol-powered fuel cell.

Additionally, batteries pose a whole bevy of problems. Operators have to drive around with a large unit filled with lead-acid. The battery power degrades as the charge decreases. The large pickers and lifts use a lot of power; the drop in charge can significantly affect the time to perform a task. Using lead-acid batteries creates strong fumes and requires safety suits. In addition, they take a lot of space to store and charge. By switching to GenDrive fuel cells, UNFI was able to reclaim that space—about 9,800 square feet—because there is no longer a need for the charging stands and voltage stations.

“Even though it is still early in the installation, we believe the technology is the right fit and Plug Power is the right teammate. Everyone worked hard to quickly implement the solution and make sure our needs and questions were addressed along the way,” said Madsen. “They helped us with all of the safety training and explained the hydrogen fuel protocol. It is important to do your due diligence and investigate the technology, but you could not go wrong if you choose to partner with Plug Power.”

Madsen said, “Plug Power was easy to work with and flexible. The implementation strategy and process was on-time and customized to meet our needs.”

Garstka said, “Hydrogen should be used in every food distribution center because it is the most natural and cleanest fuel available. We recapture the water that the GenDrive fuel cells generate and use it in our scrubbers and mop buckets to clean and sanitize our facility. It is the purest cleaning water you can get your hands on, it wants to get dirty.”

The Vital Stats

- » UNFI's Sarasota facility employs approximately 160 associates and serves as a regional distribution hub for customers in the Southeastern United States
- » 65 Plug Power GenDrive fuel cells are deployed at UNFI Sarasota
- » Indoor hydrogen fueling dispensers are strategically located throughout the facility
- » Equipment operators can quickly refuel the GenDrive units in less than 3 minutes, completely eliminating the need to change, store, charge and maintain multiple lead-acid batteries per piece of equipment
- » UNFI Sarasota operates with a fully implemented hydrogen safety plan
- » 160 employees are trained on the operation and safety of hydrogen use
- » Improved operator productivity due to elimination of battery degradation and charging time; projected estimates of manpower savings are \$146,000 annually
- » Projected carbon emissions reduction of 132 metric tons annually

GenDrive hydrogen fuel cells versus Lead-acid batteries

Full power throughout the entire shift

Optimal operation in sub-zero temperatures

Reduces greenhouse gas emissions

Safe by-products (heat & water)

Easy to refuel; less than 3 minutes

Energy savings

Manpower savings

No extra storage space required

Waste minimization

No fumes

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