INDUSTRY TRENDS

WHAT’S DRIVING TRANSFORMATIONAL CHANGE IN THE SUPPLY CHAIN?

Making Supply Chains More Energy-Efficient
Sustainability Reporting
Freight Rail Driving Sustainability and Efficiency
Collaborative Logistics
Urban Logistics
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MAKING SUPPLY CHAINS MORE ENERGY-EFFICIENT

BY DINAH WISENBERG BRIN

Piedmont Natural Gas, a natural gas utility serving customers in the Carolinas and Tennessee for more than 60 years, may seem at first blush to have little in common with Digital Lumens, a six-year-old Boston company specializing in “intelligent” computerized LED lighting systems.

Both companies, however, are among those staking positions in an alternative-energy universe that should surge as more industries embrace the task of developing environmentally friendlier, energy-efficient supply chains. Aiming to cut their costs and carbon footprints, companies across a wide range of industries are deploying solar panels, fuel cell technology, lower-energy lighting systems, natural gas vehicles and other technologies to make their supply chains more energy efficient.

MHI’s recently released 2014 Annual Industry Member Report – Investments That Drive Supply Chains, based on a multi-industry survey of more than 170 company executives, found that nearly 52 percent planned to invest in sustainability, primarily in energy management systems but also in batteries, chargers and motors, sustainable lighting solutions, loading dock equipment, battery-powered forklifts and alternative wind, solar, fuel cell and natural gas fuel sources.

Thirty-nine percent had no energy efficiency requirements in place, while 17 percent cited energy cost reduction and control as the biggest operational challenge.

"Consumer demand for supply chain transparency and government regulations to reduce negative environmental impact are leading companies to invest in sustainable and energy efficient solutions,” the report noted.

That’s where businesses like Piedmont Natural Gas, Digital Lumens and many others come into play.

Natural gas
Charlotte, NC-based Piedmont, capitalizing on the relatively new technology for extracting natural gas from shale and on the separate development of natural gas engines, has been instrumental in opening 20 fueling stations for natural gas vehicles in its territory—half of them public-access stations that Piedmont

A tractor owned by EPES Transport System of Greensboro, N.C., a contract carrier for home improvement retailer Lowe’s Companies Inc., refuels at a compressed natural gas (CNG) station in Greensboro owned and operated by Piedmont Natural Gas.
owns and operates and half of them on sites owned by the company’s customers. Recent prices for compressed natural gas (CNG) at Piedmont’s new Nashville public-access station were $2.19 per gasoline gallon equivalent, compared with $3.60 to $3.70 for regular gasoline.

In Piedmont’s markets, natural gas vehicle (NGV) “first adopters” tend to be companies already in the supply chain space and delivering goods in tractor trailers, according to Greg Johnson, the company’s manager of NGV business development. “We see it as a rapidly growing market as you have the realization among the early adopters that this is indeed an economic advantage for them,” Johnson said, noting that regulations making diesel engines more expensive to operate also make the case for transition.

One customer, Frito Lay, operates a manufacturing facility in Charlotte and uses its own CNG fleet to transport products, he said. “We’re seeing companies move to natural gas for their vehicles, their trucks, because the economics are favorable, the environmental benefits are there and being more sustainable in their fuel use enhances their reputation,” Johnson said. He noted that “more and more companies” are starting to test CNG for their private fleets.

While adoption is less rapid, contract carriers such as EPES Transport System of Greensboro, N.C., a Piedmont customer, are starting to use natural gas trucks as well, Johnson noted. Company-owned and contract logistics fleets will be the “bread and butter” of Piedmont’s CNG business for the next few years, he said.

EPES recently purchased several CNG trucks for its North Carolina routes and is fueling them at Piedmont’s public access stations. Earlier this year, EPES said it would deploy heavy duty natural gas trucks to haul products for Lowe’s regional distribution center in Valdosta, Ga., part of the home-improvement company’s goal to switch all its regional distribution fleets to natural gas by 2017, according to California-based Clean Energy Fuels Corp., the largest U.S. provider of natural gas for transportation. Clean Energy Fuels opened a new America’s Natural Gas Highway station for EPES in Valdosta.

The Georgia fleet’s use of liquefied natural gas (LNG) should reduce greenhouse gases by 448 metric tons annually, the equivalent of removing 90 cars

Aiming to cut their costs and carbon footprints, companies across a wide range of industries are deploying solar panels, fuel cell technology, lower-energy lighting systems, natural gas vehicles and other technologies to make their supply chains more energy efficient.
from the road, Clean Energy said in a release. Natural gas fuel can cost up to $1.50 a gallon less than regular gasoline or diesel fuel and cut greenhouse gas emissions up to 30 percent for light-duty vehicles and 23 percent for medium- to heavy-duty vehicles, the company said.

“We stand behind the vision of Lowe’s to be an industry leader in alternative transportation throughout its supply chain,” EPES President Britt Conley said at the time. “Cleaner burning and less expensive natural gas makes sense for our fleet and we will continue to explore additional opportunities to deploy natural gas trucks throughout our operations in the eastern United States.”

In Oregon, Kroger announced this year that it will replace 40 diesel trucks with 40 LNG trucks that should start making store deliveries by the end of 2014, filling up at a private station designed by Clean Energy Fuels. The move was a first step in Kroger’s plan to switch its fleet to alternative fuels.

Kroger says it works to reduce its carbon footprint by managing its energy consumption, refrigerants and fleet fuel use.

“Kroger continues to work aggressively in all areas of our business to reduce energy consumption. Our new and remodeled stores use the latest technology to make a big difference in energy efficiency. This translates into a significant reduction in operating costs and our carbon footprint,” the grocery chain’s website says. Kroger says it uses the U.S. Environmental Protection Agency’s Energy Star program to track and analyze energy use across its stores.

Logistics company UPS is a major player in energy-efficient transportation, saying it operates more than 3,150 alternative fuel and low-emissions vehicles, including CNG and LNG, biomethane diesel, electric and electric hybrid vehicles, propane, and hydraulic hybrids.

Low energy lighting

Digital Lumens integrates energy efficient LED lighting with control systems to help customers achieve savings at more than 500 installations spanning more than 100 billion square feet of industrial space in more than 30 countries, according to senior application engineer Jessica Morris. On average, combining LED lighting with controls produces an average 90 percent energy savings in lighting retrofit situations, she said in an interview.

“We’re in a great upward trend, we’re moving into new environments, the applications for our system are growing,” said Morris, who noted that sustainability is becoming more important to customers.

Digital Lumens’ customers can use data from its central management system to fine-tune controls, looking at facility occupancy, daylight harvesting (use of natural light) and other variables to maximize savings, according to Morris.

“We believe every light should be intelligent,” she said. “Each light has its own individual sensor and they will sense the light in their environment, in their space, and they will dim and brighten independently” to maintain a consistent light level throughout the facility. The company also allows customers to compare and manage energy use across facilities, she noted.

Solar

Many of the largest and best-known U.S. companies are taking steps to make their supply chains more energy efficient by utilizing solar. As of mid-2013, cumulative commercial deployment of photovoltaic solar installations by U.S. businesses, non-profits and government organizations totaled 3,380 megawatts at more than 32,800 facilities, a more than 40 percent increase from the previous year, according to a report by the Solar Energy Industries Association and the Vote Solar Initiative.

The top 25 commercial solar customers in the United States based on installed capacity were led by Walmart, Costco, Kohl’s, Apple and Ikea, the groups’ 2013 report said. Others on the list included Macy’s, Johnson & Johnson, Staples, Campbell Soup, Kaiser Permanente, Volkswagen, Walgreens, Target, Safeway, FedEx, L’Oreal and General Motors.
“For many companies, electricity costs represent the single largest operating expense. The continued fall in solar system prices and the adoption of innovative financing models that can reduce up-front costs allow companies that have deployed solar to dramatically reduce energy expenditures. In a growing number of markets, companies can either generate or purchase solar energy at or below local retail electricity rates,” the report said, adding that solar allows customers to lock in fixed energy prices for decades.

**Fuel cells**

According to the U.S. Department of Energy, there are more than 4,500 fuel cell-powered material handling vehicles and lift trucks on order or deployed at facilities around the U.S. Leading firms including Sysco, Lowe’s, Procter & Gamble, BMW, Walmart and FedEx are utilizing this technology.

Zero-emission fuel cell-powered vehicles provide economic, operational as well as environmental benefits, when compared to traditionally powered systems operating in high-throughput distribution center and warehouse environments. Fuel cell powered solutions increase uptime, provide consistent power, fast fueling and eliminate the need for onsite battery storage.

GE Fuel Cells is currently working to commercialize a fuel cell technology that runs on natural gas. The technology utilizes a solid oxide fuel cell, or SOFC. The new system’s power generation efficiency can reach an unprecedented 65 percent. The fuel cells are still in the prototyping phase, and GE is currently developing a pilot manufacturing facility, where it can test the technology at commercial scale.

These technologies may not completely replace traditional energy sources in the U.S. any time soon, but they are part of a growing menu of sustainable options for a more energy efficient supply chain. And they are making real strides toward improving operational efficiencies, optimizing resource use and increasing profits.