SUSTAINABILITY: Green trends growing in materials handling

Going green isn't going away: It's a permanent and increasingly important part of the global business landscape—and that includes materials handling.

By Lorie King Rogers, Associate Editor

Once upon a time, a company measured its success using two colors: red or black. Today, there's a third color making its way to a company's bottom line: Green. Environmentally friendly practices and products are becoming increasingly important to companies and trading partners on a global level.

So, how does this affect the materials handling industry?

In February of 2011, Affinity Research Solutions, with support from *Modern*, conducted a survey for the Material Handling Industry of America (MHIA) to establish a baseline of the state of environmental sustainability in warehousing, distribution and manufacturing. The survey, entitled "Sustainability in Warehousing, Distribution & Manufacturing," found that companies in the materials handling sector are steadily embracing earth friendly products, processes and practices.

In fact, 48% of the 368 qualified respondents said their facilities currently have a sustainability initiative underway, and 88% reported that they plan to have more attention focused on sustainability in the coming year.

A number of respondents have launched environmentally friendly initiatives by picking the green, low-hanging fruit first. Meaning, they've started by making small, affordable and relatively easy to incorporate changes, like installing fans to circulate temperature-controlled air and lighting fixtures. For example, replacing outdated HID (high intensity discharge) lighting fixtures with more energy efficient, high-intensity fluorescent fixtures can produce 50% more light while saving 50% of energy costs.

And when asked the reasons why, respondents identified a number of reasons for adopting greener ways. Social responsibility topped the list of reasons, with 78% claiming this to be the driving force behind supply chain sustainability initiatives; 63% cited resulting efficiencies; and 42% reported that customers were demanding this action.

"The customer is more focused on asking the question of sustainability in the supply chain, so companies are more focused on incorporating solutions that will demonstrate their commitment to reducing their carbon footprint," says Joel Anderson, president and CEO of the International Warehouse Logistics Association (IWLA).

Here are some examples of how industry leaders are answering the sustainability question and making the world a little greener from inside the four walls of their facilities.

At the dock

Temperature control at the dock is an ongoing battle, but there are a number of winning strategies. For example, dented or poorly fitting dock doors can allow temperature-controlled air to escape, which translates to money drifting out the door. So repair or replace dented dock doors, seal up the gaps, and install dock shelters.

Hall's Warehouse Corp. operates seven facilities in the New York, New Jersey and Philadelphia area and offers 1.7 million square feet of ambient, refrigerated and freezer space. When the company installed more than 250 dock shelters—150 of which were on freezer or cooler doors—it reduced its annual refrigeration consumption by 3.9 MW and 3,143 tons of carbon dioxide. According to Patrick Sahradnik, Hall's purchasing administrator and energy resource coordinator, that annual savings is equivalent to 320,777 gallons of gasoline.

Dock plates are another target. In colder climates, steel dock plates can cause what Richard Murphy, president and CEO of Murphy Companies, refers to as the "ice cube impact." Murphy says that by installing winter insulated blankets on the dock plates, his facility reduced its heating expense by 10% while increasing employee comfort level immeasurably.

The same goes for pit-style dock levelers. Installing a dock seal around the leveler perimeter can prevent temperature-controlled air on the inside from getting out and outside ambient air from getting in.

Here comes the sun

In warmer climates, it makes sense to look to the sun for power. When States Logistics Services designed its newest facility in Tolleson, Ariz., it incorporated a rooftop solar array, which has been successful in generating a significant portion of the facility's power.

So successful, in fact, that States installed a second solar energy system consisting of more than 1,000 solar panels on the roof of its DC at its corporate office in Buena Vista, Calif. The system generates about 560,000 kilowatts of power annually, which is equivalent to providing electricity to 51 American homes year after year.

Danny Monson, States' president and CFO, says, "We're generating our own electricity with our own solar panels and powering anything electrical." That includes recharging lift truck batteries on the facility's fleet, which is currently about 45% electric and 55% propane.

Solar panels on the roof of States' warehouse facility in Arizona generate enough energy to power the facility and recharge its electric lift truck batteries.

Power play

With power companies increasing rates and calculating prices based on peak usage, it makes sense to charge equipment—including electric lift trucks—during off peak hours and spread out power usage more evenly over the day, says Ken Ruehrdanz, warehousing and distribution market manager for Dematic. "This means operating conveyors, sorters and automated storage and retrieval (AS/RS) technology with a consideration toward energy usage. Energy demand management should now be considered when planning the work to be performed over each work shift," Ruehrdanz adds.

An energy monitoring audit can be performed at a facility, whereby power consumption data is collected and analyzed. Based on energy usage information from sub-metering stations, a demand management plan can be formulated. "The solution is to spread out power usage and reduce peak usage of conveyors, sorters and other technology," explains Ruehrdanz. "This tactic

reduces spikes in power usage and keeps the user in a lower energy price range."

Adding a sleep mode to equipment can also lower energy consumption. Running conveyor at full speed all day long when it isn't needed wastes energy, increases wear and requires more maintenance, says Ruehrdanz. Conveyor controls can be programmed to time out and shut down if no load activity occurs.

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Conveyors aren't the only equipment to benefit from energy controls. Vertical storage carousels can be equipped with intelligent energy management systems that apply an incremental power reduction process that automatically switches stopped carousels to four different levels of standby mode. All systems that consume energy, even when the carousel is still, are systematically closed down by the control system. The final step turns the carousel off at the main power switch, which is ideal for end-of-shifts because it prevents the machine from consuming electricity overnight or over a weekend.

Out with the old

Upgrading and replacing old conveyor components is an effective energy-saving strategy. Existing conveyor can be upgraded to low-voltage motor driven roller conveyor with multiple speed settings and multiple settings for start up. Slower speeds and soft start control further reduce energy usage.

A traditional pulley motor assembly can be replaced with an energy efficient motorized pulley (drum motor) that reduces energy usage, resulting in 96% efficiency compared to 30%.

Modernizing some of your facility's sortation equipment can also result in an energy savings. "There are upgrade kits available that allow the sorter to operate using less energy," says Ruehrdanz. "For example, if the mechanical portion of a sliding shoe sorter is worn out, it can be upgraded. New components are incorporated that allow the sorter to use less energy."

Modular and robotic conveyance solutions

Changes and improvements to equipment can also lead to ancillary savings in areas, like shipping resources and lighting expenses. For example, modular conveyor systems, which are lighter than the old metal variety, ship partially assembled in a box, which reduces freight costs and transportation emissions. These systems not only add flexibility, they subtract cost and emissions into the atmosphere.

For more flexibility and savings, look to mobile fulfillment systems like those recently installed at the new 1.2-million-square-foot Gold LEED designated Crate and Barrel facility in Tracy, Calif. These mobile robotic goods-to-person product movers have not only resulted in a cleaner, quieter working environment, they have reduced energy consumption and lowered the light bill.

"From a sustainability standpoint, the systems creates a more desirable work environment that's not as loud and dirty," says John Ling, Crate and Barrel's vice president of supply chain management and logistics. "From a power perspective, the mobile pods bring product to pickers so the storage area doesn't have to be lit, which saves on energy."

Ling says it's hard to estimate the precise savings, however, the overall improvement is significant when looking at the reduction in the amount of equipment and motors from the old conveyance system and the opportunity provided to use less lighting.

Pallets, packaging and reusables

Less is more, and that includes weight. While pallets are responsible for carrying the weight of our products around the world, they shouldn't contribute to the weight of shipping these products. Pallets manufactured from wood by-products are about 60% lighter than the conventional hardwood type, so transportation, energy and handling costs can be reduced.

Manufacturing pallets from wood by-products also prevent millions of pounds of scrap wood from landing in a landfill every year.

Another way to keep material from going to the landfill is to use returnables and reusables. Reusable plastic bulk containers can save companies with a large shipping infrastructure in many industries millions of dollars annually, as well as help keep tons of cardboard out of the waste stream.

"Returnables make sense, especially in a closed loop system where product is traveling a fairly short distance," says Bill McMahon, who is responsible for sales and marketing at ORBIS. Automotive manufacturing is a good example. At one point in time, for every car manufactured, 90 pounds of waste went into the landfill. Today, McMahon says, that number is almost zero because of reusables.

"More and more companies are demanding a lean, sustainable, cost-effective solution to replace cardboard in their operations," says Mike Thomas,

new product development manager for Buckhorn.

As a result, new reusable container designs and materials are being offered. For example, one collapsible container, which is constructed of material that is 30% lighter than traditional plastic, features an integrated pallet and lid system, meaning the pallet can be used as the lid when storing product. Then it folds flat and fits within its own footprint, creating a 5:1 return ratio, which helps to reduce transport costs.

Control temperature at the dock by repairing or replacing dented dock doors, sealing up the gaps and installing dock shelters.

But, if your packaging is a puzzle, Thomas recommends conducting a site visit for a general audit of your operation and packaging systems. "Many companies in warehousing and distribution carry a lot of different types of containers, which can be inefficient," he says. The idea is to consider all different types of containers and minimize what you have on hand, since there are efficiencies associated with minimizing doing more with less.

Tracking the green footprint

Whether your company has already gone green, or is still considering adopting green practices, it's important to establish a baseline performance and track your results. In July 2011, the IWLA introduced the industry's first metric-driven, facility-output-based sustainable logistics program for warehouse operations in North America, called the Sustainable Logistics Initiative (SLI). SLI is an online tool that enables participating companies to report, track and improve upon their green status.

Linda Hothem, IWLA chairman and CEO of Pacific American Group, says that when she joined the board of the IWLA, she realized that the industry didn't have the same tools and programs available as other industries to measure its carbon footprint. "We needed to establish metrics to benchmark and improve upon. The data collected through SLI will inform our industry and our customers on the best and most efficient means to improve sustainable warehouse practices," Hothem says.

Companies participating in SLI—third-party logistics providers—supply facility data and measure performance in three areas of responsibility: environmental, social and economical. They receive a SLI certificate as proof of participation then, as metrics improve, facilities can achieve silver, gold or platinum status in the program.

The entire process is verified by a neutral party, The Sustainable Supply Chain Foundation (SSCF). The SSCF is the organization tapped by IWLA to be the third-party verification source for the IWLA Sustainable Logistics Initiative. □