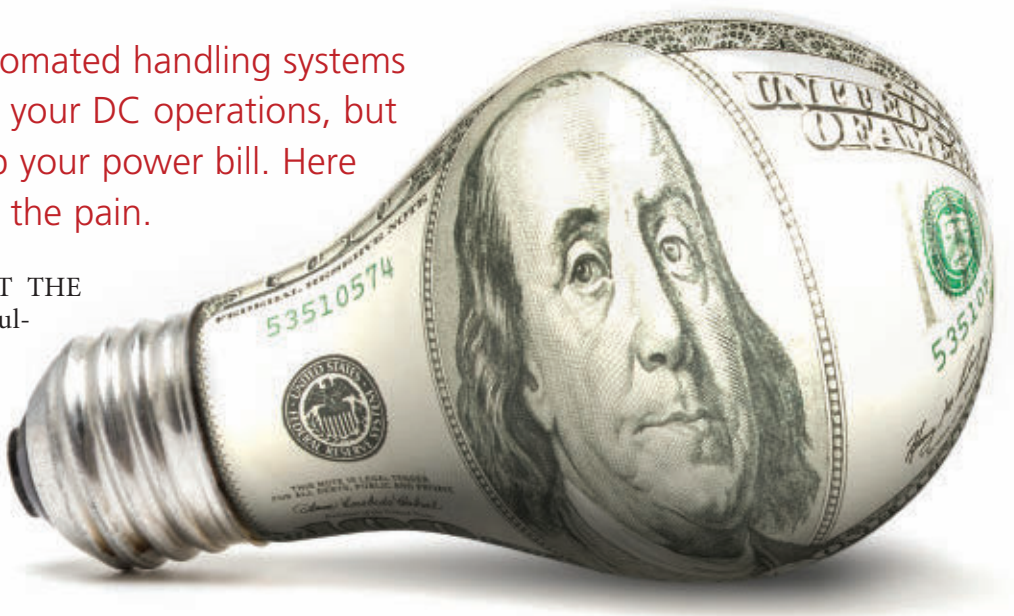
Five clever ways to cut your DC's electric bill

Today's whiz-bang automated handling systems may be revolutionizing your DC operations, but they're also running up your power bill. Here are some ways to ease the pain.



UNDER PRESSURE TO MEET THE demands of omnichannel fulfillment and a rising tide of e-commerce orders, many warehouses have turned to automated material handling systems as a way to boost accuracy, cut labor costs, and speed up fulfillment. Equipment such as automated storage and retrieval systems (AS/RSs), conveying systems, lifts, and shuttles can go a long way toward helping DCs achieve those objectives.

The solution comes with a steep price, however. Automated facilities may see their electric bills climb to meet the increased energy demands of running these powerful machines.

In response, facilities are seeking out new ways to optimize energy consumption while keeping the pedal to the metal on fulfillment speed, according to Markus Schmidt, president of Swisslog Warehouse & Distribution Solutions, Americas. But what can they really do in this regard? We decided to ask the experts for some advice. What follows are their five top suggestions for ways to hold down your power costs.

1 *Plug into the IoT.* Intrigued by the notion of the Internet of Things (IoT) but haven't yet found a reason to take the plunge? This may be just the excuse you're looking for. The IoT, essentially a network of connected devices that communicate with one another automatically, can provide a big assist to DC managers looking to reduce their energy consumption. To begin with, it can supply vital data on a facility's energy usage patterns, which users can then analyze with an eye toward identifying savings opportunities. For example, by attaching power-usage sensors to individual pieces of material handling equipment, users can monitor energy consumption throughout their facility in real time, Schmidt said. Armed with this information, they can track changes in energy consumption for every room, aisle, drive, and motor in the building, identify inefficiencies, and make adjustments.

Another way to use the data is by analyzing it for purposes of integrated energy management control. In this approach, users set a baseline level of energy consumption for each machine, then manage their operation so multiple devices share their combined power "budget" in the most efficient way. For example, two sensors can communicate and delay the start of one machine by a few seconds in order to minimize the peaks in power draw that occur when two machines start up simultaneously, said Samuel Schaerer, controls development manager with the Swisslog Warehouse & Distribution Solutions Technology Center.

2 *Recuperate and recharge.* Energy "recuperation" is another strategy for cutting the amount of electricity required to run large material handling systems,

according to Swisslog. Just as hybrid automobiles recharge their batteries by braking at stoplights, AS/RS cranes, miniload cranes, shuttle systems, and conveyor lifts can generate their own electricity. They do this by using their motor as a generator, creating electricity from friction when braking. The electricity they generate can then help power the unit itself or even be shared with others.

Energy recuperation offers considerable potential for savings. For example, AS/RS cranes can cut their energy draw as much as 20 percent by powering their horizontal motion using the electricity recuperated by their own downward vertical motion, according to Swisslog. Likewise, shuttle systems can cut their power consumption by 20 percent by timing the acceleration of one shuttle to occur at the same time that another shuttle hits the brakes.

GOING EASY ON THE JUICE: SWISSLOG'S LIGHTWEIGHT VECTURA AS/RS STACKER CRANE WAS SPECIFICALLY DESIGNED TO MINIMIZE POWER DRAW.

3 *Slow down and lose the weight.* Automated conveyor systems consume the most electricity while they are running at high speed, so facilities can save serious money by automatically throttling down the systems during off-peak periods, a Swisslog analysis shows.

One way to capture those savings is by installing photo eyes that determine when a section of conveyor is idle, then send that signal through an IoT network to a central controller, the company said. Particularly effective in large-scale systems with thousands of feet of powered conveyors, these systems can save significant power by switching off certain conveyor zones—or even a specific motor on a single roller—when not in use.

Another way to cut the amount of electricity consumed by mobile material handling systems is to put the machines themselves on a diet. In recent years, some manufacturers have redesigned equipment like automated guided vehicles (AGVs) and AS/RS stacker cranes using lightweight materials, slashing 20 to 30 percent of the vehicles' weight without compromising their load-carrying capability, said Swisslog. Compared with their heavier brethren, these lightweight machines draw far less power from onboard batteries or the facility's grid.

4 *Use smart software to save volts.* Heating and lighting are the top two energy drains in warehouses. As a result, the path to power savings usually begins with a few basic steps like installing efficient LED lighting, adding skylights to capture natural daylight, installing loading dock seals and shelters, and adding building insulation.

Once they've completed those steps, managers can squeeze some additional savings out of their operations through the smart use of software. One way to do this is by automating the controls for various building functions, said Norm Saenz, managing director at the consulting firm St. Onge Co. For example, they might use a warehouse control system (WCS) to automatically turn off equipment when it's not in use.

In facilities that use electric vehicles, software such as lift-truck fleet management systems can play a big role in energy-conservation efforts. Among other applications, managers can use these systems to collect data on battery charging patterns and power consumption, which they can then mine for energy-saving opportunities, Saenz said. For example, the data might show that switching to quick-charging equipment would help avoid the power peaks caused when all of the fleet's vehicles try to recharge at the same time.

5 *Soak up the sun.* Many industry professionals took notice when UPS Inc. announced plans to install $18 million worth of solar panels on facilities around the country—a move the company estimates will cut each building's power bill in half. Drawn by such promises, an increasing number of warehouse and distribution facilities are adding solar panels to their vast expanses of flat roof.

And it's not just facilities located in the South. Although it was once thought that solar panels only paid off in sunny desert locations, that's simply not the case, said Richard Murphy Jr., president and CEO of Murphy Warehouse Co., a family-owned logistics service provider based in Minneapolis. The technology actually works in any environment—from Arizona to Minnesota—because solar panels function most efficiently when they're cold, he said.

Along with helping trim a DC's electric bill, solar panels can generate extra savings when a facility hooks them up to industrial batteries that store backup power. Among other benefits, having a reserve power supply on hand might allow a company to avoid buying costly diesel generators for emergencies, Murphy said.

Alone or together, these five creative strategies are helping managers minimize their DCs' power consumption. The steps require some effort, to be sure, but the payoff can be huge. By giving them a try, managers can not only trim their electric bills, but also "green up" their operations. On top of that, they stand to achieve a quicker return on investment on the automated equipment that is fast becoming essential to meeting today's demands for lightning-fast distribution and fulfillment. □

Editor's note: *To learn more about energy-efficient products for the DC, see our Spotlight on Energy-Saving Equipment in this issue's Rollouts section.*