

# How Tracking/Managing Energy Consumption Drives Real Cost Savings

## INTRODUCTION

The spacious, expansive nature of the warehouse or distribution center (DC) makes it a prime candidate for managing energy consumption and cutting costs, helping companies achieve their corporate sustainability and environmental goals. While most organizations acknowledge the potential benefits of reducing energy consumption, and a good portion measure usage across various systems, numerous obstacles stand between these firms and the path to significant cost savings, many of them internal hurdles.

For most warehouses, lighting and heating consume the biggest chunks of energy, with lighting alone comprising 60 percent of the typical facility’s energy consumption, according to E Source. These systems present significant opportunities for manufacturers and distributors that want to minimize energy costs. And some have already turned to more energy-efficient systems – smart lighting, motion and daylight sensors, and other technology-based solutions to help reduce energy consumption. For example, using intelligent LED lighting systems, a leading manufacturer of castings and machined products was able to reduce its monthly lighting bill by 85 percent. An aerospace distribution center took a similar step and has been able to shave its lighting energy usage by 90 percent in its 172,000-square-foot corporate design center.

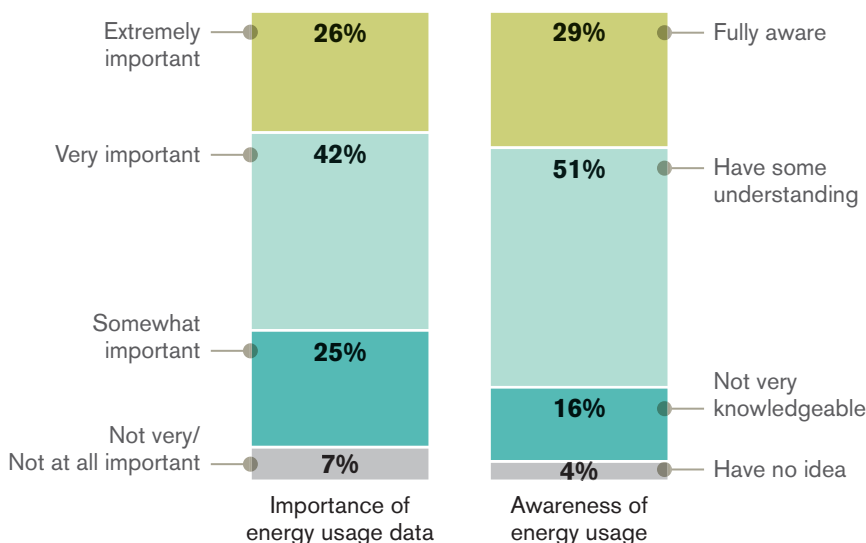
Yet many others continue to pay hefty bills. Either unaware of the options, or unwilling to invest the time and money into these efforts, companies are missing out on the significant savings that many of their counterparts are already tapping into, and the sustainability benefits that are increasingly important to customers and public markets.

In a recent study conducted by Peerless Research Group (PRG) on behalf of *Modern Materials Handling*, *Logistics Management*, and *Supply Chain Management Review*, 230 managers involved with initiatives related to warehouse and distribution center operations shared opinions on the importance of monitoring energy consumption, sustainability, and environmental issues in their facilities. They also provided insights into their current and planned energy use and efficiency strategies. The managers who participated in the survey work for companies whose facilities average 330,000 square feet in size, with one out of five working for companies whose total square footage of all of warehouse/distribution centers exceeds 500,000 square feet. Most individuals surveyed work at locations where the primary activity is manufacturing, distribution, or warehousing.



FIGURE 1

## The importance and awareness of energy usage



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### Top Priority: Understanding Energy Consumption

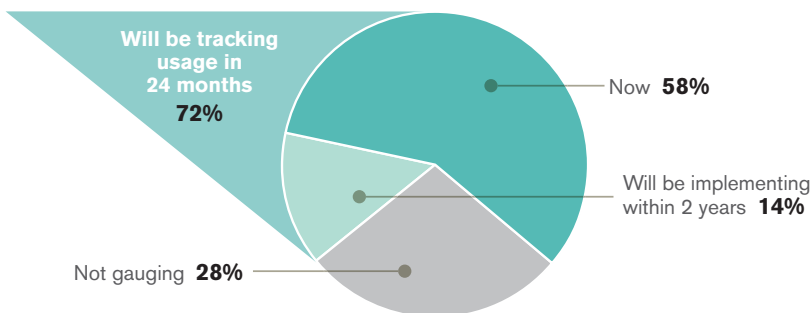
Understanding energy usage is a fundamental requirement for the majority of survey responders, as nearly all (93 percent) of those surveyed consider consumption levels to be “critically important.” Yet, more than two-thirds admit that they have only some, very limited, or no knowledge at all about their facilities’ energy usage, showing a disconnect between high-level priorities and operational systems. Fewer than one in three claims to be well informed about power consumption at their sites. (See Figure 1)

To further illustrate the challenge, 42 percent of managers are not tracking energy consumption at their facilities. So, it’s not surprising that a high percentage of respondents have no visibility into consumption – compared to the 58 percent of companies that do track these metrics.

And while the percentage of those who’ll be using some type of tracking system is expected to rise during the next few years – with 14 percent planning to implement a monitoring program – more than one out of four (28 percent) will still not be employing any strategy for evaluating usage two years from now. (See Figure 2)

FIGURE 2

### Operations tracking/planning to track energy usage

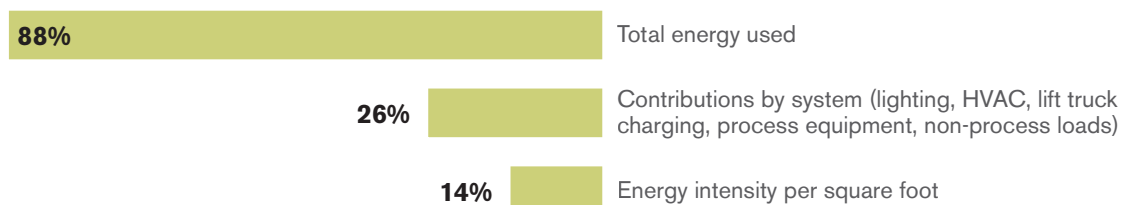


### How Firms Are Tracking Energy Use

Some organizations have a detailed understanding of their energy consumption, but many are only reviewing usage on a broad level and not tracking the factors that truly drive energy utilization. For example, few are analyzing their energy usage on a granular level, including consumption by systems or energy intensity on a per-square-foot basis. This suggests a lack of organizational commitment to assessing energy utilization – a problem that, in turn, can obscure key information, including exactly which machines, equipment, processes or infrastructure are consuming the most energy. (See Figure 3)

FIGURE 3

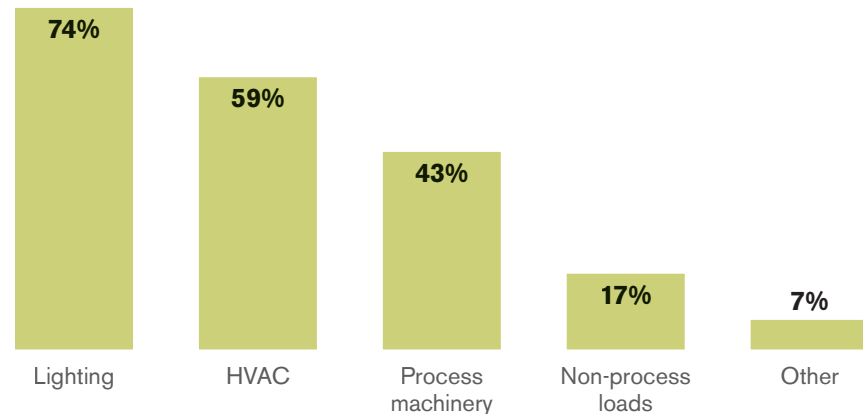
### How operations are tracking energy usage



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FIGURE 4

### Systems from which energy data are collected

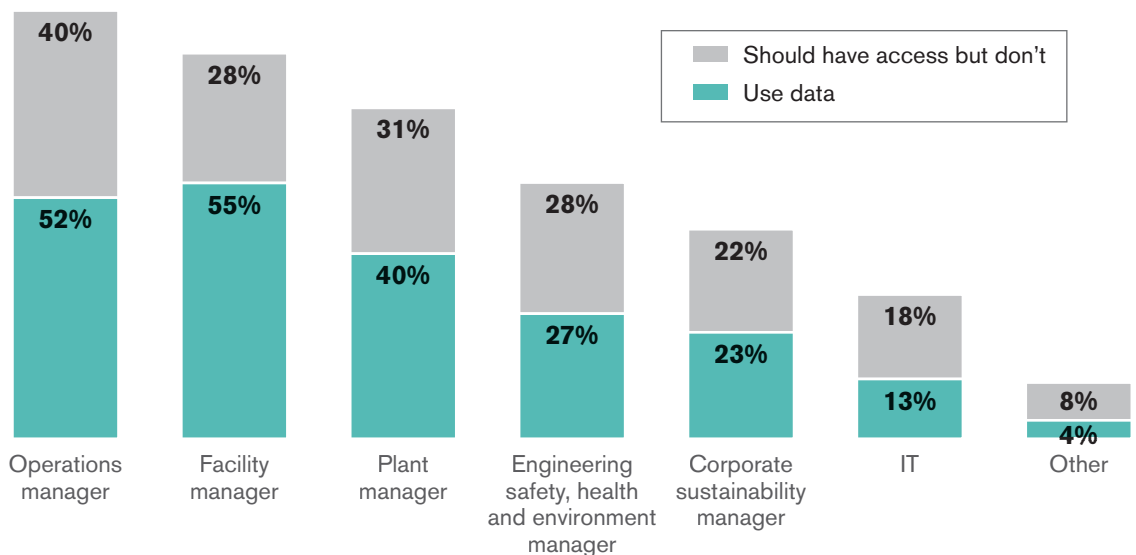


Currently, most companies collect data on lighting, HVAC and process machinery using monthly utility bills and meter readings to understand usage information and charges. The data is also used to measure consumption and to further examine productivity; to determine cost center chargebacks; and to employ guidelines to help attain sustainability goals. (See Figure 4)

In most cases, operations, facility, and plant managers are tasked with reviewing and using energy consumption data. Interestingly, in the survey, four out of 10 managers have no visibility into that information. Facilities, plant, and environmental managers could also benefit from such visibility (but generally don't have access to it). (See Figure 5)

FIGURE 5

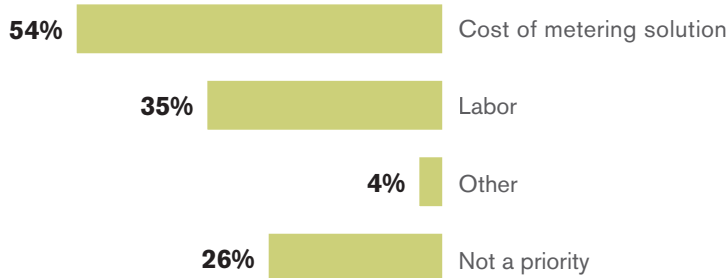
### Managers who use energy consumption data/ Managers who should have access to data but don't



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FIGURE 6

### Issues/Challenges with tracking energy consumption



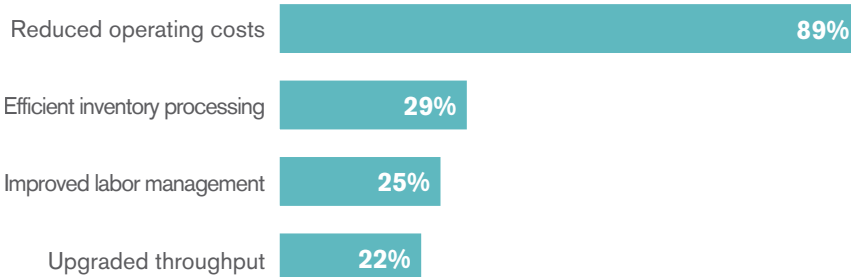
### The Challenge: Prioritizing and Tracking the Data

From the survey, one out of four organizations does not identify tracking energy as a priority. These organizations are not capitalizing on potential money-saving opportunities, and are missing out on the chance to reap significant cost savings and other benefits. (See Figure 6)

Lowering operating costs is seen as the primary benefit of tracking energy consumption, yet many companies are not verifying usage levels and subsequent costs. This prevents them from realizing additional benefits, including improved process efficiencies and more effectual labor management. (See Figure 7)

FIGURE 7

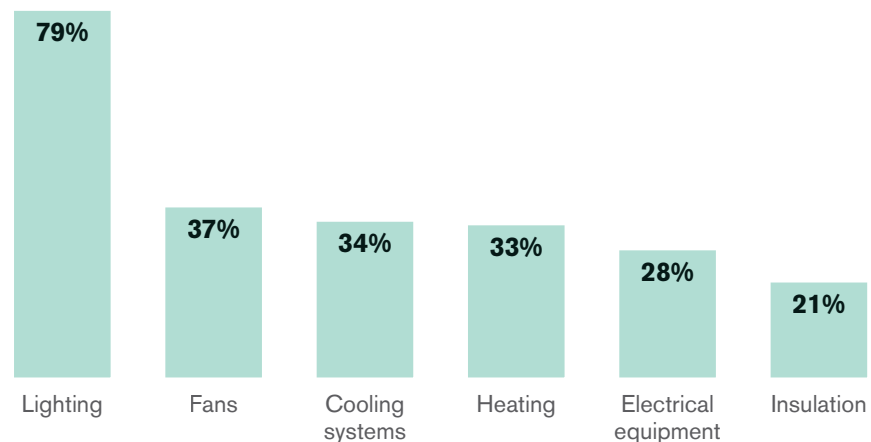
### Benefits gained by gauging energy usage



For organizations that want to improve efficiency, lighting is the highest priority (79 percent), followed by fans (37 percent), cooling (34 percent), and heating (33 percent) systems. These solutions represent areas of the warehouse where energy and subsequent cost savings can be best quantified. (See Figure 8)

FIGURE 8

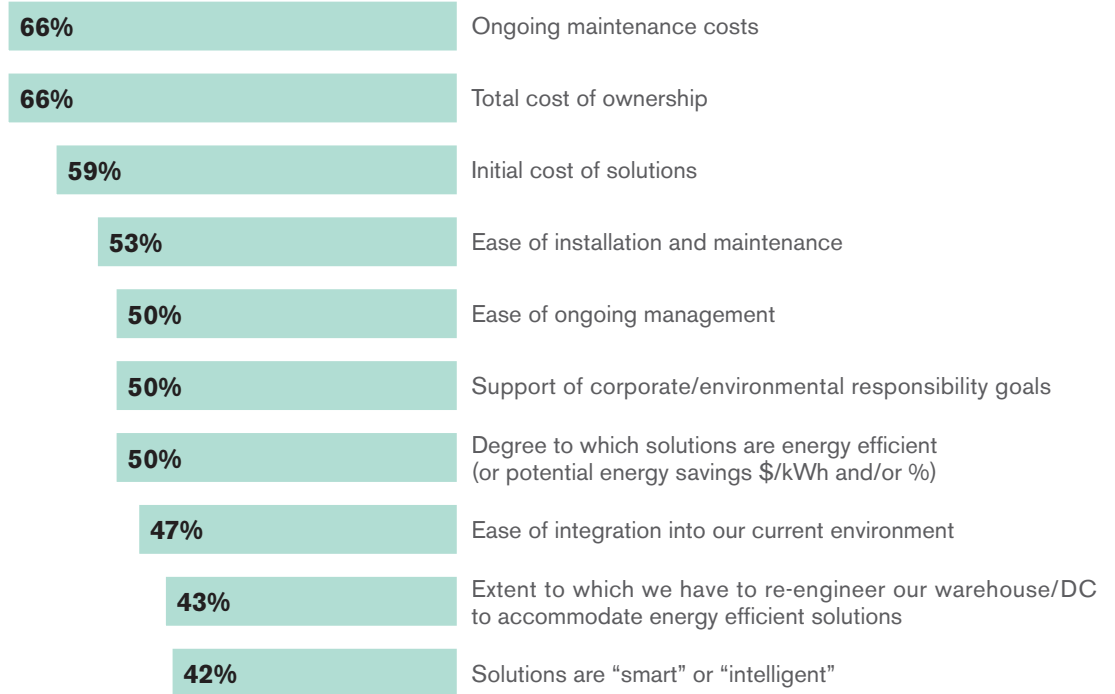
### Building materials and systems replaced/planning to replace with energy efficient solutions



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FIGURE 9

### Factors considered highly important when evaluating energy efficient solutions for warehouses and DCs



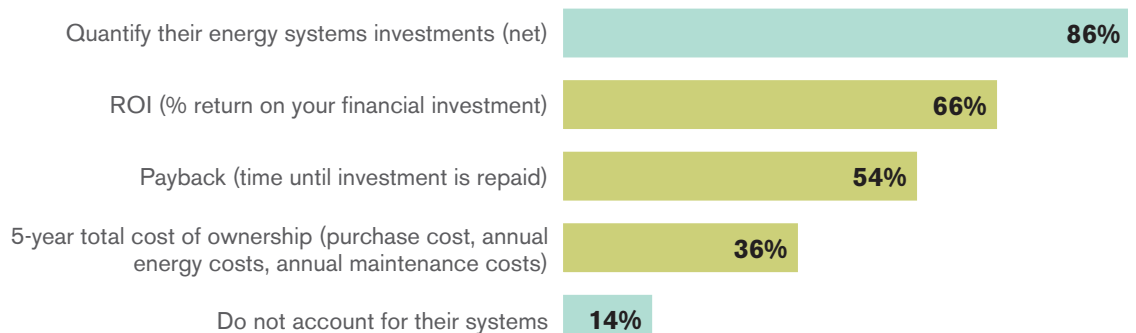
### Financial Considerations When Evaluating Energy Savings Solutions

When evaluating energy efficient solutions for use in warehouses and DCs, costs associated with implementation and maintenance, cost accountabilities (Total Cost of Ownership or TCO), and ease of installation and maintenance are highlighted as key evaluation criteria. Product attributes like being "energy efficient" or "smart" rank further down the list. (See Figure 9)

In many organizations, measuring the value of an investment and determining a reasonable payback time frame (i.e., return on investment or ROI) are important initiatives. According to our survey, however, some companies simply *don't view energy solutions as assets*. While managers tend to focus on ROI (66 percent) or payback (54 percent), one out of three have a 5-year TCO plan – a trend that paints energy spend as a long-term investment versus a potential cost-savings area. (See Figure 10)

FIGURE 10

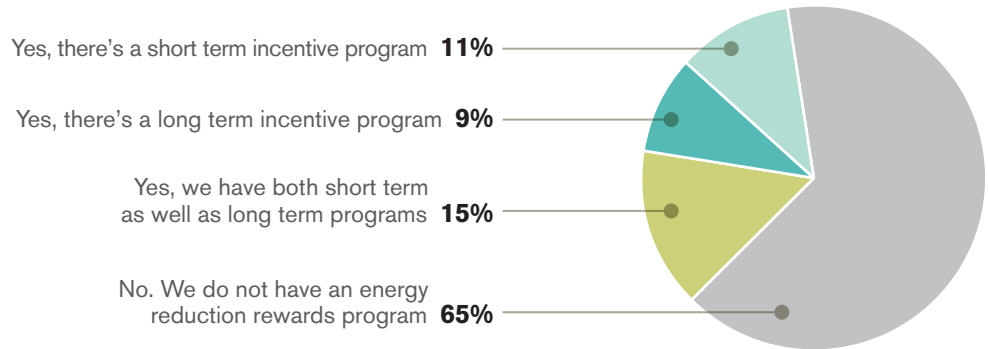
### Investment returns on energy systems and solutions



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FIGURE 11

### Companies capitalizing on energy reduction rewards programs



While cost savings has been cited as a priority for most companies, *only one out of three companies we surveyed offer incentive plans to stimulate energy conservation practices*. These companies are missing out on significant cost savings that can reach as high as 90 percent of a facility's total monthly lighting consumption. (See Figure 11)

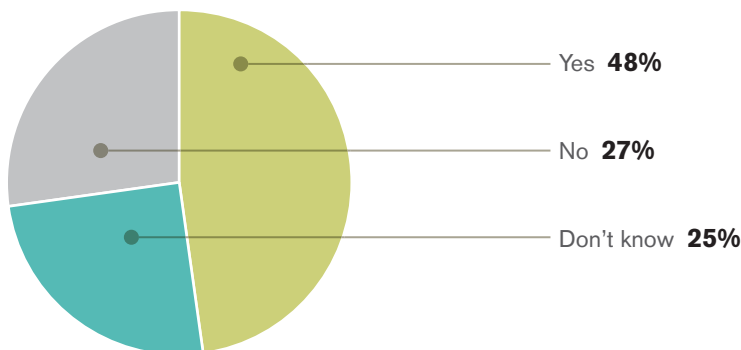
Utility companies offer rebates, incentive programs and/or interest-free financing to drive energy efficiency in their territory, yet fewer than than one-half of survey respondents are taking advantage of these opportunities. This is a missed opportunity for those companies that don't view energy consumption as a potential cost-savings area. (See Figure 12)

### Departments Involved in Decisions Related to Energy Savings Solutions

When it comes to decisions regarding the evaluation and implementation of energy-saving solutions, various departments are involved. This can present a problem – particularly when the objectives and goals of disparate groups are not aligned. Having many individuals with different disciplines, interests, priorities, and even budgets presents the all-too-familiar “too many cooks in the kitchen” issue. With a dedicated champion, even the most well-meaning team members can have a counterproductive effect on the evaluation process.

FIGURE 12

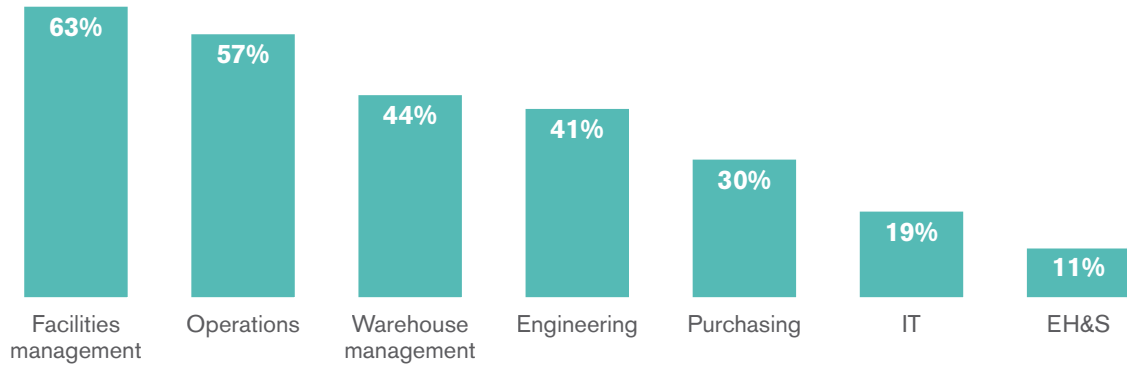
### Companies participating in provider rebate programs



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**FIGURE 13**

**Departments involved in identifying, buying, implementing and/or maintaining energy efficiency projects**



Charged with installing, executing, and maintaining implementations on an enterprise-wide basis, IT departments play a key role in energy-saving initiatives. In fact, two-thirds of those we surveyed say they regularly interact with their IT departments when employing energy-efficiency projects. (See Figure 13)

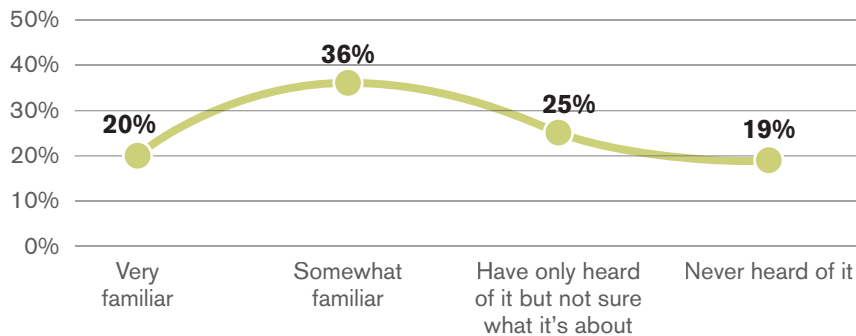
**The Internet of Things (IoT)**

Recognition and adoption of the Internet of Things (IoT) concept is still in the early stages. Defined as the network of physical objects that contain embedded technology to communicate

and sense or interact with their internal states or the external environment, IoT promises to create new opportunities for facility managers who tap into the trend. According to the survey, just one out of five managers is very familiar with the idea of IoT, while almost one-half (44 percent) have either only heard of IoT or are not aware of it at all. But, the IoT is gaining understanding, with about one out of three (37 percent) acknowledging that they are “somewhat familiar” with the concept. (See Figure 14)

**FIGURE 14**

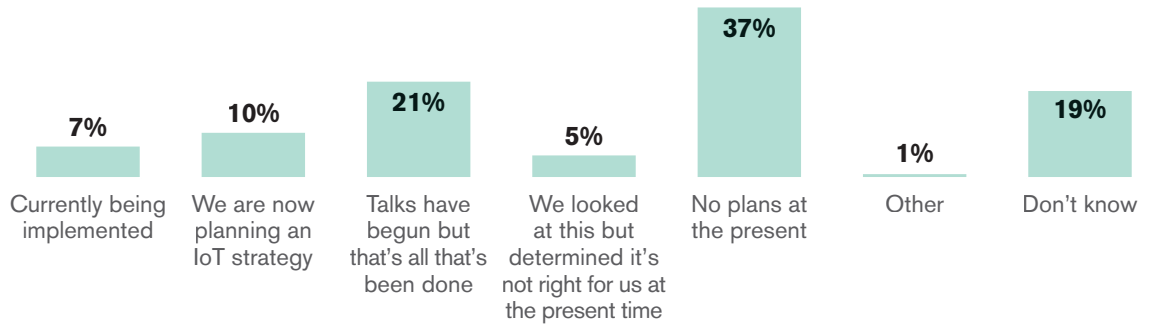
**Awareness of the Internet of Things**



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FIGURE 15

Adoption of Internet of Things solutions



To date, few companies (7 percent) have either implemented or are in the planning stages (10 percent) of an IoT model while the large majority (61 percent) has either determined that IoT at the present time is neither a solution for their operation nor something that's being considered. Another 20 percent just aren't thinking about IoT, which confirms that the market is in the early adoption stages and that decision-makers need to be educated on the applications and benefits of an IoT strategy. (See Figure 15)

Regardless of current IoT awareness and adoption rates, survey respondents agree that the systems and applications for IoT implementation need to be easy to use, secure, compatible with their existing infrastructure, and supportive of mobile solutions. (See Figure 16)

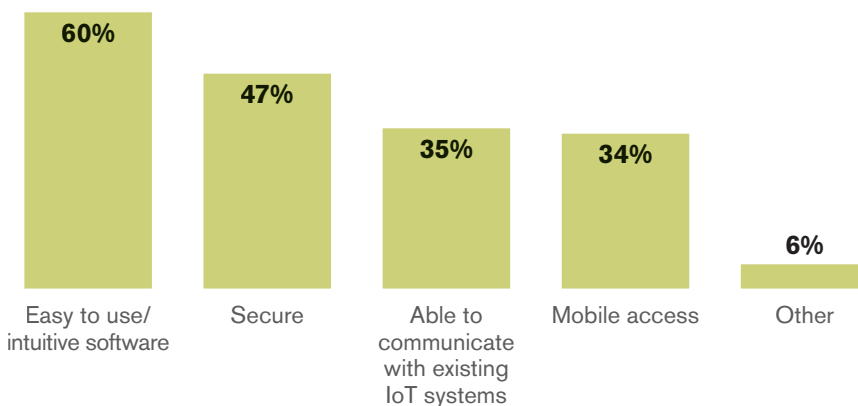
Summary

Despite high levels of energy consumption by warehouses and DCs, and the potential for significant cost savings, most companies continue to operate with a "business as usual" mindset when it comes to energy savings. And while seven out of 10 companies are either "fully aware" or "have some understanding" of energy consumption and the related costs, the granularity of this knowledge (or, a lack thereof) reveals opportunities for improvement.

The survey data also highlights the need for better alignment of goals, processes, and programs at the corporate level. For example, more respondents rated TCO and ongoing maintenance costs as being highly important over initial solution costs when considering energy efficiency solutions. Yet, just 36 percent evaluate TCO; instead, the majority focus on ROI (66 percent) and payback (54 percent). This suggests that few organizations take the long-term view on lower energy consumption – a view reinforced by the fact that 65 percent of respondents said that their organizations "do not have any incentive program tied to energy reduction goals."

FIGURE 16

Characteristics an IoT solution should possess







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Compounding the issues above is the fact that there are a lot of different “cooks” or stakeholders in the “kitchen,” attempting to reduce energy usage but making few inroads toward this goal. And while awareness of IoT is growing, the solutions associate with it will obviously need to be easier to use and intuitive before warehouse and DC managers will even consider them.

“The data shows that the materials handling industry has organizations distributed across the energy-efficiency spectrum, with high-performers already locking in savings and driving down operational costs,” said Judd Aschenbrand, Director of Research, Peerless Research Group. “Those who have not implemented programs have opportunities to lead their organizations to build new efficiency initiatives, with the additional potential to deploy IoT-based systems that will offer value far beyond energy efficiency.”

### Research Methodology

This research was conducted by Peerless Research Group on behalf of *Logistics Management*, *Modern Materials Handling*, and *Supply Chain Management Review* magazines for Digital Lumens. Executed in September/October 2015, this study was administered online among subscribers to *Logistics Management*, *Modern Materials Handling*, and *Supply Chain Management Review* magazines.

Respondents were prequalified for their involvement in decisions regarding their companies’ warehouse and/or distribution center operations.

The findings are based on information collected from 230 top materials handling, logistics, and supply chain managers. Respondents are predominantly executive management (26 percent), warehouse and operations management (28 percent), plant management (14 percent), and engineering management (13 percent). Survey respondents came from a wide range of industries, including food and beverage, automotive equipment, chemicals and pharmaceuticals, industrial equipment, and electronics. All company sizes are well-represented in the study, with the average firm having \$908 million in 2015 revenues. One out of four (23 percent) are employed at locations with 500 or more employees.

### About Digital Lumens

Digital Lumens is a global supplier of enterprise-scale intelligent LED lighting systems for leading commercial and industrial customers, delivering 90% energy savings and a platform for building intelligence. The system includes LightRules® lighting management software for maximum control and efficiency, and a broad portfolio of intelligent high bay and linear LED fixtures with embedded occupancy and daylight sensors to provide high-quality light when and where needed.

With deployments of 200 million square feet (20 million square meters) of coverage across 40 countries, Digital Lumens brings the tangible benefits of Internet of Things (IoT) to commercial and industrial lighting environments. For more information, please visit [www.digitallumens.com](http://www.digitallumens.com).

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