

Energy Intelligence Report: An Eye On Efficiency

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This article first appeared in IMPO's [July 2013](#) [1] issue.

Our fourth annual Energy Intelligence Report will again bring the readers of [IMPO](#) [2] the latest and greatest product and industry trends as it relates to plant energy use and overall business efficiency. This annual report has been designed to spark some ideas for cost savings measures, as manufacturers continue to face tightening budgets and competitive pressures. We hope you can find something of value as you look at your own plant floor and try to determine where to start.

Keep an eye out for [parts two](#) [3] and three in the August and September issues, culminating with our Energy Incentive Guide – a state-by-state breakdown of the available tax rebates, credits, and utility-based financial incentives to help manufacturers invest in energy efficient or green products and alternative energies.

Finding a fit for energy efficiency

Before you look to your own plant, it's important to understand what your peers are doing as it relates to investing in new technology and equipment. What does the average IMPO reader value when it comes to this critical area? We asked nearly 300 IMPO readers to provide us with their take on where they'll spend their money and why – as well as how energy efficiency fits into their overall strategy for success.

An Eco Analysis

This year's data shows an interesting shift as the focus on impending purchases of energy efficient equipment declined steeply over last year. In 2012, 62 percent said they anticipated making a purchase over the six months ahead, compared to this year's group of 46 percent. It's possible this dip relates to overall hesitation as industrial businesses adjust to the political and business climate, as well as the still struggling manufacturing job market. For example, the latest ISM Manufacturing Report on Business – a monthly economic assessment developed by the Institute for Supply Management – showed the manufacturing sector contracting in May for the first time since November of 2012. There are many factors in play here, and Bradley J. Holcomb, CPSM, CPSD, chair of the ISM Business Survey Committee, attributes some of the pullback to declines in the PMI, which is “pretty much driven by new orders. The fact that it's down 3.5 percent is a pretty big decline,” he explains. “And among those reporting a decline are four of the largest sectors that we cover, starting with computer and electronic products, chemical products, transportation equipment, and petroleum and coal products.”

This Manufacturing ROB from ISM has followed a series of ups and downs over the past year, and many experts blame the results on a litany of factors. Is it the job market or health care that's caused manufacturers to intermittently pull back? Have

sequester cuts or global economic influences been the drivers? Unfortunately, it's probably a mix of everything. "While the world economy is more stable, U.S. factories are confronting a challenging global environment with an ongoing and widening recession in Europe and a sluggish rebound from a significant emerging market slowdown," noted Cliff Waldman, Senior Economist for the Manufacturers Alliance for Productivity and Innovation (MAPI) in a recent interview. "Further, while the U.S economy continues to grow, it is, as recent consumer spending data shows, slow and choppy growth laced with great monetary and fiscal policy uncertainty."

So perhaps manufacturers are taking a wait-and-see approach, and plan to hold tight to their purse strings for the time being. This year's group of 46 percent who plan to make new equipment purchases based on energy efficiency is actually closer to the rate that our readers told us in 2010 (52 percent). After creeping up to 57 percent in 2011 and 62 percent in 2012, this rate seems to be easing once again.

It makes sense, then, that slightly fewer respondents would cite energy efficiency as the number one consideration when it comes to equipment spend. Last year, eight percent said that was so, compared with seven percent today. On par, the ways our respondents classified their priorities remained mostly in line with last year's responses:

- The majority, 55 percent, say that energy efficiency is important, but not above other issues (Figure 2).
- 32 percent said they consider it, but it often becomes overshadowed by other, more pressing concerns. This is no surprise, especially considering the number of maintenance managers that responded. Oftentimes these folks are tasked with getting a line or machine back up and moving, and minimizing downtime supersedes any other issues when they look to procure a part quickly.

Still, it's obvious that there are some problem areas as it relates to energy efficiency in our respondents facilities, and "plant environment" tops the list in terms of areas the respondents plan to target for more energy efficient upgrades. This makes sense, as things like fans and lighting are often considered the "low hanging fruit" of an energy savings initiative and typically offer a quick ROI (see our case study section on lighting retrofits on [page 28](#) [4] for more details). The second most cited area of focus is that of motors and drives — an equipment category often maligned for being one of the highest consumers of industrial energy (Resources like MotorsMatter.org offer guides to help users identify motor-related considerations that affect the overall efficiency of motor-driven systems). Rounding out the top target product categories were pneumatics (air compressors, pumps and valves).

The question also yielded a 1 in 4 response saying they were not looking to upgrade any existing equipment at this time, which is an increase over the 1 in 5 who said the same last year.

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Categories respondents identified as their “least efficient” fell in line with Figure 3 and included plant environment products (HVAC, fans, lighting); pneumatics (air compressors, pumps, valves); and motors and drives. Lower on the response rates was material handling — also of low priority for an energy efficiency-driven upgrade (Figure 4). It’s possible that many plants don’t regularly assess warehouse and material handling products for efficiency because there is simply less visibility for this type of data.

For those who wrote answers in the other category, responses ranged from computers and other facility electronics, boilers, steam heat exchangers, and soldering guns. One respondent simply said “The biggest cost (item) gets the most attention,” suggesting that the capital expenditures perhaps dictate how thoroughly the technology is analyzed for its performance and efficiency.

When survey participants were asked to clarify the reasons the products identified in Figure 4 were so inefficient, there were a range of responses:

- Many (49 percent) said it was too expensive to replace existing equipment for more efficient models.
- 16 percent cited the natural quality of the product as the reason it consumed so much.
- 12 percent said neglect from employees – such as leaving a compressor running or failing to turn off lights/machines – was the primary reason their equipment used more energy.
- Nearly 8 percent said, simply, there were no other options available for that particular piece of equipment.
- The write-in area cited age, leaks, and equipment lifecycles. One respondent said his “plant has been downsized and the compressors and fans are sized for much more equipment.” Said another: “EPA regulations require them. It is a joke. We now use 18 percent more fuel.”

Buyers Tell All

Around 85 percent of those surveyed say they have purchased equipment of some kind in the recent past. Of those survey respondents, their dollars are going towards the following (permitted to check all that apply):

- Plant environment (HVAC, fans, lighting): 51 percent.
- Motors and drives (AC/DC motors, belt or chain drives, gear motors): 45 percent.
- MRO items and consumables (cleaning equipment, lubricants, adhesives): 24 percent.
- Pneumatics (air compressors, pumps, valves): 23 percent.
- Material handling (conveyors, forklifts): 20 percent.

- Fluid handling (pumps, valves, filtration): 19 percent.

Specifics from the “other” category cited investments in things like filling and forming machines, laser cutting and packaging equipment, chillers, and thermal imagers.

When making these recent purchases, 62 percent said that they were at least in part based on their energy efficiency. Eight percent said the purchase was wholly based on the energy efficiency of the product, and 16 percent said not at all.

With this annual survey, we also try to determine the level of interest our readers have in purchasing consumables that fall into the “green” realm. While energy efficiency and eco-friendly are not one and the same, purchasing green consumables can be a way to integrate a more earth-friendly effort into your overall purchasing. As Figure 5 identifies, many survey respondents are willing to consider consumable products if available in green, organic, or recycled materials. Permitted to check all that apply, the most popular areas of interest were towels/wipes, cleaning supplies, and degreasers. Nearly 16 percent said they were not interested in green versions of their existing products.

An Ideal Case

Manufacturers have high expectations when it comes to ROI with nearly 38 percent identifying 1 to 2 years as the return on investment they’ve either achieved or anticipate to observe in new equipment, including energy savings (Figure 6). A nearly identical-sized group said 2 to 4 years was practical. Eleven percent said they’ve seen ROI of less than one year.

Finally, we asked our survey to identify any type of technology – theoretical or existing – that they’d implement immediately if they had the opportunity. Some of the more consistent responses included things like:

- “Perfect” insulation.
- “A high torque, low power grinder.”
- “A centralized monitoring system for energy use.”
- “Pumps that don’t leak.”
- “VFDs.”

Further on their wish list is more equipment that integrates power sources for reducing their reliance on the traditional grid. As manufacturers often find operating at peak times unavoidable, different energy sources like solar and wind are increasingly peaking their interest.

Interestingly, one respondent told us that what they really need is guidance. If they could have one thing, it would be: “Not a technology,” rather, “an energy management professional.”

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