STRATEGIC MANAGEMENT IS A CRUCIAL KEY TO BUSINESS SUCCESS. Manufacturers in industries from aerospace to agriculture work to manage process time, labor and production costs, supply chain logistics, and product quality, among many factors, to ensure they stay competitive. But as every manufacturer knows, you cannot manage what you do not measure; and energy is no different. While you can track total cost and consumption in utility bills, aggregate data limits visibility into specific opportunities for improvement. With better monitoring, that can change.

Some may argue that the business impacts of energy consumption are not clear enough to justify monitoring; a McKinsey report, for example, suggests that energy only makes up between 2% - 9% of manufacturing costs. Companies like 3M, Ford, and Boeing, however, are committing to reducing greenhouse gas emissions through better energy management, and seeing savings as a result. In this sense, the environmental and economic benefits of sound energy management are directly related, and in many ways even compound each other.

But knowing how to improve energy management starts with understanding how elements in a manufacturing system use energy. To do that, many technologies are emerging as cost-effective ways to understand individual machines better. As Iteros explains in their case study, energy meters can be installed on equipment (or circuits) of interest and connected to data collection and visualization tools via Ethernet, Wi-Fi, or another data communication protocol like Bluetooth. In some cases new equipment may have built-in capability; but even for legacy machines, new industrial internet technologies mean the cost of adding this type of monitoring capability is coming down. This is particularly beneficial since older machines often hold the most potential for savings.

Once connected, the availability of data allows managers to create accountability amongst machine operators and production teams, encouraging collaboration towards more efficient operations. A white paper by the American Council for an Energy Efficient Economy highlights a study from the Electric Power Research Institute that suggests self-governance inspired this accountability correlates to an easy 5% - 10% savings. Data visibility can also reveal low- or no-cost actions that make a big difference. In the same paper, for example, ACEEE cites a Boeing plant that reduced consumption by 22-percent in two years, simply by turning lights, air handlers, and equipment off when they weren’t being used. Similarly, monitoring can identify maintenance needs—like leaks in steam or compressed air lines—that are more cost-effective to fix before they cause a problem. Aggregated across an entire manufacturing system, this visibility can also help identify demand spikes; and by adjusting operations to lower peak demand, you can lower costs for the whole month.

The results translate directly into business benefits, both in energy savings and related improvement in operational efficiency. Even small actions can have an impact. One Schneider Electric plant, for example, found that a monthly backup compressor test occurred during a high activity period, inflating peak load. Simply by reassigning it to an off-shift time, the plant saved $2,500 a year.

As with any new technology, barriers to adoption can include a perceived lack of funding, a lack of know-how, implementation logistics concerns, and general resistance to change. But compared to some other technologies, energy monitoring is relatively simple, fairly low-cost, and can be implemented with minimal effect on operations.

The COE-ASM has experience developing our own energy monitoring technologies. Read our case study to see our approach, or see the Department of Energy for more.