What Continuous Improvement Tools Can You Use to Reduce Energy Consumption?
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In today’s economic environment, individuals and businesses alike are being forced to scrutinize and reduce every possible expense in order to drive lower operating costs. Going through the list of expenditures, it’s impossible to skip over your energy line items, both because of their sheer size and the savings opportunities they represent.

Electricity, natural gas, propane, fuel and steam are substantial costs for nearly all businesses and enormous costs for many facilities. In this environment, managers all across the world are allocating resources, both time and people, to reduce the usage of these energy streams. There is a tremendous opportunity for managers to go after savings utilizing the suite of continuous improvement and lean tools that exist in their organizations. This article will survey the application of some of these tools.

**Value Stream Mapping**
Value stream mapping is a lean technique that is used to visually represent process information and material flows from incoming materials to the end customer. When coupled with site walk downs and good data on energy use by area, practitioners can focus in on areas for the largest benefit. Integrating energy data onto the value stream map is a powerful way of highlighting the opportunities that can be presented on both “Present” and “Future State” maps. Individual projects usually flow out of these value stream mapping exercises so this is an excellent way to prioritize projects for completion.

**Six Sigma**
The Six Sigma DMAIC approach can be a very powerful way to reduce energy usage within a system and hone in on variation that drives energy consumption. The statistical tools in use with this methodology allow its users to identify and quantify interactions between variables that may not be well understood. The DMAIC process (Define – Measure – Analyze - Improve – Control) guides practitioners towards creating processes that have far fewer defects and excursions that are usually at the core of wasted energy. A good example of this is heating and cooling systems that work to maintain constant process temperatures. Stabilizing these processes can prevent overheating and then the responsive cooling cycles that are burning kilowatts as they combat each other. Many energy savings are very obvious but Six Sigma can be applied for those opportunities where there are multiple variables involved and cause and effect relationships are not readily apparent.

**Kaizen Events**
Because Kaizen events focus on reducing the seven forms of waste, energy reductions often result from projects that focus on an area or a process. Consider, for example, a project that was commissioned for reducing waste in color concentrates in a plastics facility. One of the changes was a small reconfiguring of the plant layout and the material flow to its use. This ended up dramatically reducing the amount of forklift miles traveled and resulted in about $20,000 annually in propane savings that was used to fuel the forklifts.
Kaizen events that are intentionally structured for reduction of energy as a primary outcome can be even more powerful. For example, managers have commissioned steam or compressed air leak reduction events where both detection and immediate correction by crafts takes place on the spot. These events produce immediate returns that can be registered in real time and deliver very rapid savings to the operation. More importantly, when done properly, Kaizen events really engage employees so they are enrolled in energy conservation efforts in the future.

Care must be taken to ensure that the staff detecting leaks is in balance with the crafts assigned to make the repairs. It’s much easier to find and tag the problems than it is to correct them, so the event organizer must take care to properly scope the event and not end the week with a demoralizing list of things that have to be corrected after the event.

**Standardized Work and Visual Controls**
Standardized work procedures and visual controls also have the powerful effect of driving out waste and mistakes in industrial processes. It is critical that Kaizen events produce standardized work and visual controls for savings that require consistent execution to be realized. Kaizen event leaders will often claim savings in the close out meetings that are never realized. Inconsistency and waste creeps back into areas where standardized work and visual controls are not reinforced with leadership behaviors.

Virtually every recognized lean tool and technique can be utilized to drive energy savings in industrial settings. Just take the time to properly scope out opportunities and give careful consideration to which tools are applicable for the challenges that are present in your facility.

Your bottom line and our natural environment stand to be benefit from your efforts.