Gaining Efficiencies in Plastics and Rubber Products Manufacturing

With almost 200 facilities in Iowa, the plastics and rubber products manufacturing industry is a major component of Iowa’s economy and its overall energy use. To improve the energy efficiency of plastics and rubber products manufacturing facilities, MidAmerican Energy Company provides incentives through their EnergyAdvantage® programs.

Control your utility bill now by implementing cost-effective, energy efficiency measures with MidAmerican Energy’s EnergyAdvantage technical assistance and financial incentives. By utilizing process and non-process related energy efficiency measures available through the EnergyAdvantage programs, you can reduce project simple payback while benefitting from long-term energy savings, without compromising product quality.

The Department of Energy estimates that reducing the nation’s plastics industry’s energy use by even 1 percent could shave at least $100 million from its total annual energy costs.

Plastics consumes approximately 6 percent of all the energy used by U.S. industries.

One-half of the eligible MidAmerican Energy manufacturing plastics accounts have participated in EnergyAdvantage programs.

The plastics industry could save up to 53 percent of energy costs if leading energy efficiency measures were incorporated.

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Most plastics and rubber products manufacturing facilities have the opportunity to save 10 to 20 percent by incorporating energy efficiency best practices.

Midwestern Manufacturing Energy Costs

The plastics and rubber products manufacturing industry is a significant user of electricity and natural gas in the Midwest and the nation. That translates to a national total annual energy cost of more than $4.2 billion, of which more than $1.7 billion is incurred in the Midwest.

Fortunately, industries with high energy use often have the highest potential to save energy and operating costs with energy efficiency improvements. Plastics and rubber products manufacturers in Iowa can control their utility bills by implementing cost-effective energy efficiency measures, and the EnergyAdvantage programs provide technical assistance and financial incentives to help.
Energy Use and Distribution

The highest potential to save energy and money in plastics and rubber products manufacturing is with gaining efficiencies in energy intensive end-use processes, such as compressed air, vacuum, pump and fan equipment, and process heating applications. Of the energy used for non-process needs, lighting and HVAC provide the most substantial savings opportunities.

Energy Efficiency Best Practices

Take control of energy and operating costs with these plastics and rubber products energy efficiency best practices.

**Lighting**
High-output fluorescent lamps are an effective replacement for high-intensity discharge lamps as they use 50 percent less energy, offer better color rendering and more diffused light, all helping make the workplace safer, more comfortable and energy efficient.

**Variable Speed Drives (VSDs)**
Motor-driven systems often are oversized and inefficiently controlled. VSDs can provide a more cost-effective method for reducing flow or pressure at the source by varying the speed of the fan, pump or compressor to match the process requirements. Energy savings in VSD applications usually range from 20 to 50 percent.

**Compressed Air**
Savings of more than 40 percent can be realized through improving the supply and reducing demand in compressed air systems. Opportunities can be found in the supply side by installing new or optimizing existing equipment and reducing the system pressure. Demand can be reduced through improving end uses and repairing leaks. Blow-off nozzles can be upgraded to high-efficiency engineered nozzles or replaced with a low-pressure electric blower.

**Process Cooling**
Optimizing process cooling can reduce cooling costs by 10 to 25 percent annually. This includes the staging of chillers, reducing condenser water temperature, and improving pumping efficiency through the use of VFDs and controls. Some of the chilled water demand can be eliminated by using dry coolers or cooling towers in place of chillers, depending on the required process temperature and application.

**Process Heating**
Insulating the exterior barrel and dies on the extruder can provide approximately 60 percent energy savings. This is one of the simplest measures with significant savings. Additionally, process heating applications using natural gas typically offer the greatest technical and economic potential for energy savings.

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Emerging Energy Efficiency Technologies

Consider these cutting-edge energy efficiency projects for your plastics or rubber products manufacturing facility.

### Electric-Injection Molding Machines

Electric-injection molding machines can significantly decrease energy use by 50 to 80 percent compared to hydraulic-injection molding machines. Electric machines also have additional control benefits, such as improved repeatability and precision, and improved cycle times in some applications, allowing for faster and more-efficient production with less rejects.

### Compressed Air Recovery

Blow molding utilizes very high pressure (typically more than 500 psig) compressed air. After the molding is completed, the air within the bottle is released into the atmosphere. Existing injection-molding machines can be retrofitted to recover this air and use it in a low-pressure (100 psig) compressed air system. This measure greatly reduces the load on the low-pressure compressed air system and can result in significant energy savings.

### Radiant Barrel Heater Band

Process heating is the largest energy user at most facilities. The latest radiant heater band design is a promising solution. They are easy to install, less labor-intensive to maintain and energy efficient. The innovative design hastens warm-up times and can make cool-down systems more effective and efficient. Facilities that have incorporated this technology with extrusion machines have seen energy use reduced by as much as 33 percent.

### WHERE TO START

Time, leadership, resources and a good energy plan are essential to increasing efficiencies at any facility. A key barrier to strategic energy management for plastics and rubber products manufacturing companies can be the basic resources needed to be successful. MidAmerican Energy can assist with these needed resources through its EnergyAdvantage programs, which provide technical assistance and financial incentives for energy efficiency improvements.

To learn more about MidAmerican Energy’s EnergyAdvantage savings or energy efficiency improvements, call your MidAmerican Energy representative at 800-894-9599 or visit www.midamericanenergy.com/ee.

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**Sources:**

1. REX TCS™ Thermal Control System Cuts Energy by 33% on Plastic Extruder at PACTIV Case Study [Wisconsin Focus on Energy BP-3206-0108], 2008.