Manufacturing Plants: An Overview of Energy Use and Energy Efficiency Opportunities

Energy Use in Manufacturing Plants

Manufacturing operations are among the most energy-intensive in the U.S. Whether making steel, refining oil, or canning vegetables, there is great potential for improving energy efficiency.

Manufacturers produce heat and operate machinery using a variety of energy types, ranging from conventional sources such as electricity and natural gas to non-conventional fuels including shredded tires and black liquor. Industrial energy use is responsible for almost 30 percent of all U.S. greenhouse gas emissions, which contribute to global climate change.

Energy Efficiency Opportunities

Manufacturers of all sizes can take several simple steps to manage energy.

- **Measure and track energy performance.** Key steps include benchmarking plant energy use with ENERGY STAR or other benchmarking approaches when available and setting an energy savings goal.
- **Improve common plant systems such as motors, compressed air, steam, process heating, etc.** Evaluate systems for waste and misuse, operate them as designed, eliminate leaks, increase insulation where appropriate, and design systems for plant needs, adjusting them as needs change.
- **Turn off what is not required.** Key steps include walking through the plant when not in operation to identify energy waste, checking hours of operation and settings on equipment, establishing a list of energy shut-down procedures, reviewing these with plant managers and employees, and periodically inspecting plant adherence to procedures.
- **Get employees involved.** Hold staff meetings on energy use, costs, objectives, and employee responsibilities; procure ENERGY STAR products and other energy-efficient equipment where available.
- **Check the lights.** Replace old fluorescent and incandescent lighting with T-8s, ENERGY STAR qualified compact fluorescent light bulbs (CFLs) and other energy-efficient lighting systems, and implement a regular lighting maintenance program. Turn lights off when not in use. Maximize task lighting, daylight, and use of occupancy sensors.

Manufacturers Making a Difference:

California Portland Cement Company, CA, used the ENERGY STAR Guidelines for Energy Management to start its corporate energy management program in 2003. Cal Portland invested in employee energy education, plant benchmarking, and energy-efficient technologies to achieve significant energy savings.

Merck & Co., Inc., NJ, reduced energy use by 9.4 percent in 2006 due to its structured corporate energy program. Based on aggressive initiatives to increase accountability for energy use, educate employees, and upgrade facilities, Merck's leadership is making progress toward a company-wide goal of reducing energy use by 25 percent by 2008.

How to Talk to Manufacturers About Energy Efficiency

Manufacturers should recognize that energy is a controllable operating expense and that energy should be managed with the same expertise as other parts of the business.

Start by focusing on whether there is someone who is accountable for energy consumption in the company. From there, build on the discussion by introducing the ENERGY STAR Energy Program Assessment Matrix. This tool is ideal for beginning a dialogue about the elements of comprehensive energy management.

Other Resources for Manufacturers:

The Department of Energy's Industrial Technologies Program (**www1.eere.energy.gov/industry**): This program offers help to manufacturers in the form of energy-efficient technologies, plant energy assessments, and resources for addressing energy consumption in plant systems.

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ENERGY STAR Resources

Guidelines for Energy Management: Based on the successful practices of ENERGY STAR partners, these guidelines can assist manufacturers in improving their energy performance while establishing themselves as environmental leaders.

Plant Energy Performance Indicators (EPIs): EPIs are available for select plant types. EPIs enable benchmarking of energy consumption on a national basis for particular industries and may be downloaded from "Industries in Focus".

www.energystar.gov/epis

Energy Management Assessment Matrices: Strong energy management practices save energy. The ENERGY STAR Energy Program and Facility Energy Management Assessment Matrices help companies, energy managers, and others evaluate their energy management practices in comparison to the best practices outlined in the Guidelines. These tools also help identify opportunities for improvement.

www.energystar.gov/index.cfm?c=guidelines.assess_facility_energy

ENERGY STAR Offers:
- Guides
- Corporate and plant energy program assessment matrices
- Plant benchmarking
- Networking/training
- Technical support
- Motivational campaigns
- Recognition

Recognition for Achievements

Earn the ENERGY STAR: Plants that rate in the top 25 percent of energy-efficient plants in their industry using an ENERGY STAR EPI may qualify for the ENERGY STAR.

www.energystar.gov/plants

Become an ENERGY STAR Leader: ENERGY STAR Partners who demonstrate continuous improvement system-wide may qualify for recognition as ENERGY STAR Leaders. EPA will recognize systems that have achieved reductions of 10, 20, 30 percent, or more. To learn more, visit **www.energystar.gov/leaders.**

Visit **www.energystar.gov/industry** for more information on ENERGY STAR resources.