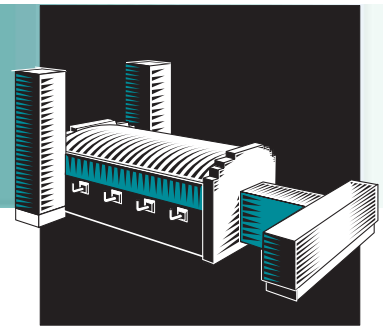


# SYSTEMS MANAGEMENT

## Cost Reduction Strategies



## REDUCING OPERATING COSTS USING A SYSTEMS ENERGY APPROACH

**Did you know...** energy typically contributes almost 15% of the manufacturing cost for one ton of glass? With higher energy prices, this figure is likely to increase.

Effective systems management practices can yield significant energy and cost savings. If you are considering implementing an energy management program in your plant or improving an existing program, you will need to review how your utility systems are managed. The following steps offer a simple approach to improving systems management practices:

- First, identify the key systems and components.
- Second, prioritize energy use systems and components.
- Third, capitalize on identified opportunities by developing a well-coordinated plan, then take action.
- Fourth, monitor operations and maintain your new systems management plan.

### Identify Opportunities

Three structural causes of inefficient system operations often present opportunities for savings:

- **Systems that are over-designed and/or run conservatively.** Conservatively designed and run systems tend to support high reliability and availability, but that could be too much of a good thing. Designing or selecting a system or component to meet the extreme condition that may exist for 10 hours out of every year will usually result in inefficient operation during the remaining 8,750 hours.
- **Systems with over-abundant utility and energy supplies often go unnoticed.** Few complaints are ever made about the operational availability of too much heat supply, water, or air within the plant - these supplies can always be throttled back, recirculated, or simply dumped to the atmosphere when not needed. Though these adjustments to oversupply are inherently inefficient, they are surprisingly common.
- **Individual system energy requirements are not measured or monitored.** Much of the energy used in industrial plants comes from central sources and is distributed throughout the facility. While plant-wide energy use may be known, the amount used by individual consumers throughout the facility is seldom noted. As a result, there is no incentive to save energy in specific areas of the plant.

### Prioritize

A small fraction of a plant's equipment is often responsible for the majority of excess energy use. Identifying the key systems and equipment opportunities that should be addressed is crucial to saving energy. The following steps can help you narrow the focus:

Step 1

**Prioritize by supply.** What is the major energy cost? If your plant spends much more on natural gas than on electricity, you may want to focus on natural gas consumption. If your plant includes electric melters, you may want to focus on electrical efficiency improvements.



## Step 2

**Prioritize by use.** Identify the dominant uses or loads for a selected energy source. A good strategy is to set aside a few hours with several staff members who are familiar with a particular part of the facility and ask them to list the most important 10-20% of the loads in that area according to the following criteria:

- Large loads (especially those that run for long periods)
- Loads that place special demands on common supplies (e.g., compressed air, electricity)

## Step 3

**Keep the Proper Perspective.** The important loads identified in Step 2 can generally be divided into specific load types (pumps, compressed air, etc.) for further analysis, but don't forget to examine the bigger picture:

- Start at the end uses of the system and work back up the energy supply path. For example, look for ways to reduce the flow rate, pressure, or temperature at the end use. End use reductions tend to yield the greatest energy benefits (e.g., a 10% reduction in temperature may yield a 25% reduction in electric power use).
- Keep a hardware systems focus - avoid limiting areas of consideration to components, such as pumps or compressors. Most savings opportunities in industrial facilities stem from changing the way a system operates, not from replacing an individual component with a slightly more efficient one.
- Keep a life-cycle systems focus - don't make decisions based on costs at just one point in the life cycle, such as initial purchase. Consider the life cycle cost of operation, including energy and maintenance costs, and reliability.

Remember - you won't be able to do it all at once. Using your energy priorities, start pursuing the options that offer the greatest potential savings. Preparing metrics such as return on investment and payback period can help you decide which items to pursue first, and convince your management that they are worthwhile investments.

## Take Action

First, ensure that management supports a systems management program. Their support will allow you to spend time training staff to recognize and repair energy-related problems. Using the systems analysis and priority-setting approach, create a schedule for testing, repair, and replacement.

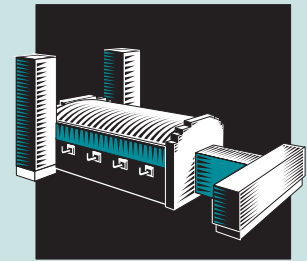
Understanding losses and opportunities can pave the way to near-term savings. For example:

- It may be possible to turn off equipment that is run for convenience or contingency reasons, providing immediate savings at little cost.
- Systems with the largest gap between normal and unusual demand conditions are good candidates for modified designs. Payback is often achieved within a few months.

## Monitor

To maximize your energy savings, implement a long-term management system with a continuous improvement approach. Schedule maintenance duties daily and empower staff to identify and minimize problems by fixing them proactively.

Document system performance along with fuel consumption, load, and mechanical conditions that impact operation - such records eventually pay for themselves. Incorporating an energy savings program with other company-wide quality, cost, and safety initiatives can help your facility meet its overall goals.



## OTHER RESOURCES

OIT Clearinghouse  
800-862-2086

[www.oit.doe.gov/bestpractices](http://www.oit.doe.gov/bestpractices)



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