

# Energy Efficiency -- Machines & Equipment

This tip sheet corresponds with Green Star Award Standard # 4 – Reduce Energy and Water Consumption. Another useful tool is “Becoming a Green Star: A Waste Prevention Guide for Anchorage Businesses.” You can find the guide online in pdf and html format at [www.greenstarinc.org/guideindex.php](http://www.greenstarinc.org/guideindex.php) or request a hard copy from Green Star.

## What Is Energy Efficient Equipment?

This tip sheet focuses on the equipment within your facility and how you can make it more efficient by replacing it with upgraded equipment or maintaining it more effectively.

Depending on your business type, equipment may simply be copy machines and printers, or it may include refrigeration units; freezers; cooking, washing and drying equipment; industrial motors, air compressors; and even swimming pool or ice rink equipment.

## How Much Can We Save?

A typical U.S. business with 100 employees may have 100 computers, 10 laser printers, four copiers, four fax machines, and two scanners.

By purchasing ENERGY STAR-qualified equipment, this business can cut its annual electricity costs by nearly \$5,000 compared to an office with equipment that does not meet ENERGY STAR labeling criteria. [U.S. Environmental Protection Agency. 2001]

There are a lot of criteria for efficient machines and equipment from which to choose. Products in more than 40 categories are eligible for the U.S. EPA's ENERGY STAR rating, including appliances, home electronics, home envelope (such as windows, insulation and roofing) and heating and cooling products. In addition, the U.S. Department of Energy's Appliances and Commercial Equipment Standards Program also develops test procedures and minimum efficiency performance standards for residential appliances and commercial equipment. These standards are applied at the manufacturer level.

## Office Equipment

Office equipment is the fastest growing type of energy user in commercial buildings. Energy-efficient office equipment will not only reduce energy use directly but it also can lower utility bills by reducing air-conditioning loads. Here are some of the products that you can purchase with an ENERGY STAR rating.



battery chargers  
computers/laptops  
copiers  
external power adapters  
fax machines  
mailing machines

monitors  
multifunction devices  
printers  
refrigerators/freezers  
scanners  
water coolers

Office equipment that has earned the ENERGY STAR has special power management features. When equipment is not in use, it automatically enters a low-power “sleep” mode. An ENERGY STAR-qualified computer in sleep mode consumes about 80% less electricity than it does in full-power mode. Overall, ENERGY STAR-qualified office products use about half as much electricity as standard equipment.

## Resources

American Council for an Energy Efficiency Economy's Guide to Commercial Energy Efficiency Equipment  
[www.aceee.org/ogece/ch1\\_index.htm](http://www.aceee.org/ogece/ch1_index.htm)

Consortium of Energy Efficiency  
[www.cee1.org](http://www.cee1.org)

Energy Star  
[www.energystar.gov](http://www.energystar.gov)

Federal Energy Management Program  
[www1.eere.energy.gov/femp](http://www1.eere.energy.gov/femp)

Motor Decisions Matter  
[www.motorsmatter.org](http://www.motorsmatter.org)

National Electrical Manufacturers Association  
[www.nema.org](http://www.nema.org)

U.S. Department of Energy - Energy Efficiency and Renewable Energy  
[www.eere.energy.gov/buildings/appliance\\_standards](http://www.eere.energy.gov/buildings/appliance_standards)

## Motors

Motors play a big role in some businesses. Electric motors account for about 75% of total electricity use in industry and half of the electrical use in commercial and industrial buildings. They operate all sorts of systems such as HVAC, refrigeration, elevators, conveyors, blowers, pumps, printing presses, and much more.



Typically, the annual operating cost of a motor far outweighs its initial purchase price. So saving energy in motors systems can be a lucrative proposition. The U.S. Department of Energy estimates that greater attention to motor system management could reduce energy costs by 18 percent.

New motors are available in standard and high-efficiency models. A high-efficiency motor will cost more but can save money in operation and provide a quick payback period. However, in some applications the higher speed of a high efficiency motor can actually increase energy use, so be sure to match RPMs as closely as possible when purchasing a new motor for applications such as running fans or pumps.

### To Repair or Not Repair

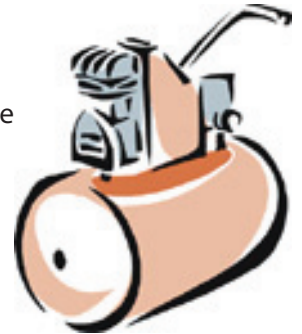
Here is a sample set of guidelines to consider when a motor goes bad. Visit [http://motorsmatter.org/motor\\_planning\\_kit.html](http://motorsmatter.org/motor_planning_kit.html) for more details about how to develop your business' custom guidelines.

- \* Replace all failed motors that operate more than 4,000 hours per year with new National Electrical Manufacturers Association (NEMA) Premium motors.
- \* Repair all other failed standard-efficiency motors greater than (some size) and replace smaller motors with new Energy Policy Act (EPAAct) motors.
- \* Repair all failed EPAAct motors greater than (some size) and replace smaller motors with new EPAAct motors.
- \* Replace any motor for which the repair cost exceeds 60 percent of a new motor cost with a new motor of the same size and speed.

## Operation and Maintenance

How you operate and maintain your machines and equipment can greatly impact their energy efficiency.

- Turn machines off whenever they are not needed. This may be after hours for some or throughout the day for others. Don't forget hidden machines, such as copiers in back hallways. Be sure to factor in warm-up and start-up procedures when implementing this.
- Adjust controls to a temperature, speed or other setting that uses less energy but still does the job.
- Perform regular scheduled maintenance. Clean, tune, and adjust; replace worn parts; and lubricate. Fix leaks in compressor hoses.
- Run large machines to avoid high demand charges when possible.
- Use waste heat. Excess process heat can be used to warm the building or heat water. A typical example is using heat from hot waste dishwasher water to pre-heat fresh water coming into the system. Exhaust air also can be used to heat air or water.
- Conversely, install an outside air intake for compressors when possible; cold air uses less energy to compress.



### EPAAct

The Energy Policy Act of 1992 (EPAAct) is an important piece of legislation for energy efficiency because it established minimum efficiency levels for electric motors manufactured or imported after October 1997. EPAAct, which was based on National Electrical Manufacturers Association (NEMA) standards, defined a number of terms, including what constitutes an energy-efficient motor. The Department of Energy issued a rule that defines these motors and how manufacturers must comply.



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