

Energy Conservation 6

Energy conservation probably offers you the largest cost savings of any in this guide. This shouldn't discount any other chapters; rather, it should tell you that energy conservation activities should not be left out when making changes and improvements in your workplace.

A general breakdown of energy use in commercial facilities, according to the U.S. Department of Energy, shows that heating (22%), cooling (18%, and ventilation (5%) together comprise about 45% of your energy expenditures. Lighting is another big expenditure at 31%. The remaining quarter of energy use is divided among a handful of activities including refrigeration (3%), water heating (7%), running office equipment (6%), cooking (2%), and others (6%).

Compared to this national average, Anchorage's standard office buildings use slightly more energy for heating and lighting, and slightly less energy for cooling. Overall, the totals are comparable to the national average.

Did You Know...

- If all of corporate America installed energy efficient lighting systems...
- ... between 40% and 75% of lighting-related pollution would be prevented.
- ... approximately \$250/year in energy costs per square foot of floor space would be saved.
- ... about \$19 billion would be saved nationwide every year.
- ... smog would be reduced by 10%, which is equivalent to taking 42 million cars off the road for one year.

The major areas where you can make an impact on energy usage are lighting, heating, and cooling.

Lighting

- ***Install more efficient types of lighting.*** Replace incandescent bulbs with compact fluorescent lamps (CFLs). Almost 90% of the energy used by an incandescent bulb is released as heat rather than light. CFLs use 75% to 80% less energy while lasting 10 to 15 times longer. They come in dimmable varieties, outdoor models, and shapes and sizes that fit almost all types of fixtures. You also can replace your fluorescent tubes with more efficient T-8 or T-5 sizes. These smaller tubes give off more light using less energy. If you replace standard T-12 lamps with T-8 lamps in a 50,000 sq. ft. facility, you can save \$54,000 over the life of the lamps.

- *Reduce wattage used in your facility.* To lower energy bills, check the wattage of lighting, as well as the number of fixtures, and determine if some could be removed or replaced with lower-wattage lamps. Installing reflectors is an extremely cost-effective way to maximize light output without increasing energy use. The efficiency of any lamp can be improved by 50% by simply installing reflectors on each lamp.

- *Reduce the light source's "on" time.* You can install switches in numerous convenient areas to make it easier for people in large shared spaces to turn off lights in unused areas. You also can install more sophisticated systems, including photocells that turn lights on and off in response to natural light levels; mechanical or electronic time clocks that automatically turn on and off lights; timers; occupancy sensors that activate lights when a person is in the area; or dimmers to reduce the wattage and output of incandescent and fluorescent lamps. Don't forget to educate staff about turning off unnecessary lighting. See Chapter 11 for a list of local companies that can provide lighting controls.

GREEN STARS

ConocoPhillips Alaska

- Removed extra bulbs and installed reflectors in light fixtures to cut electrical usage by 60% while increasing light output.
- Replaced incandescent bulbs with compact fluorescents, yielding an annual savings of \$45,000.

AMC Engineering

- Installed 34-watt energy-saving fluorescent lamps throughout the office, recouping the cost of the relamping project in just two months.

Alaska Communications Systems

- Reduced electric bills by 11.5% by converting from 40-watt to 34-watt fluorescent lamps and converting to electronic ballasts.

U.S. Army Engineer District, Alaska

- Installed occupancy sensors in conference rooms and utility closets for an estimated savings of \$16,900 per year.

Westmark Hotels

- Replaced all incandescent bulbs in public areas and guest rooms with fluorescent lamps. This saved 66 watts per fixture in over 800 fixtures in public areas, and 300 watts per room.

"According to the U.S. EPA Green Lights program, businesses tend to overlight."

- *Perform simple maintenance.* Cleaning lamps and fixtures, or repainting rooms with a light color can brighten areas considerably. Also consider group relamping instead of replacing lamps individually as they die. Incandescent and fluorescent lamps can lose 20 to 30 percent of their light output over their life. Lighting experts recommend replacing all the lamps in a lighting system at once. This saves labor, keeps illumination high, and avoids stressing any ballasts with dying lamps.

- *Use daylighting to replace artificial light sources.* The more daylight you can use, the less electricity you will need to use for lighting. Take advantage of Anchorage's long summer days to reduce your lighting costs. This can mean opening drapes and blinds, and installing skylights and additional windows. Make sure that any new windows are insulated and properly coated so that you aren't spending the money on heating that you saved on lighting.

GREEN STARS

AIDEA/Alaska Energy Authority

- Replaced older lighting fixtures with compact fluorescents and more efficient T-8 lamps on several floors. Savings in the first two months of 2002, compared to January and February 2001, were about 25 to 30%.

ConocoPhillips Alaska

- Installed energy-efficient boilers, saving \$100,000 in annual gas bills.

AMC Engineers

- Adjusted the location of some of the office's thermostats to regulate heat more evenly.

Anchorage Water and Wastewater Utility, Engineering Division

- Integrated a Direct Digital Control system with the HVAC system, which allows for maximizing the heating efficiencies and for reduction in heat use during non-occupancy periods.
- Implemented an alternative operating program at the Eagle River Wastewater Treatment Facility including reducing thermostat settings, continuously turning lights and equipment off when not in use, modified operations of the larger air exchange units throughout the plant, and heating systems were modified to use smaller, more efficient local heaters. The efforts resulted in reduced energy use and annual savings of about \$40,000.
- Installed a vinyl curtain in a stairway landing to keep hot air from rising to the second story of the King Street administrative building. This eliminated the need to use electric fans on the second floor and stabilized temperatures in the two areas.

Heating, Ventilation, and Air Conditioning (HVAC) Systems

HVAC system improvements offer the greatest potential for energy savings in most facilities. See Chapter 11 for a list of energy consultants and audit services available.

- *Consider equipment improvements and changes.* Look at the newest technologies for heating and cooling. Many of these are very energy efficient. For example, ground heat pumps can heat a building in winter and cool it in summer using the temperature of the earth. Local energy consultants can provide information about the latest technologies.
- *Install temperature controls.* Like lighting controls, temperature controls help to control systems in unoccupied areas or in several different systems in one building. Controls include programmable thermostats, clock timers and manual timers.

- *Install Energy Management Systems.* EMSs allow you to monitor and control energy use in your facility using a computerized system. Direct digital control HVAC systems are good for large facilities; significant money can be saved by EMS features that limit demand charges by shutting down parts of the facility during certain times of day.
- *Investigate commissioning.* Commissioning is a systematic process of inspection, testing, and training conducted to confirm that a building and its component systems are capable of being operated and maintained in conformance with the design intent. Usually commissioning occurs within the first year of a building's operation and is done independently of all others involved with the facility. It should, however, be done periodically and on older buildings as well.
- *Investigate alternative energy sources.* Wind and solar power are two alternative energy sources that tap into renewable energy production. Passive and active solar systems are available. Solar panels can be installed to supplement hot water heating systems or can be used to operate parking lot lighting, among other applications. Wind power may soon be available on a large scale through local power companies. Contact Chugach Electric at 762-7876 to find out more about the possibility of purchasing power generated using wind power.