

# Tips for Energy Managers



*Leading Canadians to  
Energy Efficiency at Home,  
at Work and on the Road*

## **Energy Efficiency in the Workplace**

### **Tips for Employees**

#### **HEATING**

If possible, avoid using doors that exit directly to the outside. Use exit doors with enclosed entries, vestibules or revolving doors to help keep warm or cool air inside.

Keep industrial doors closed when an inside area is being heated or cooled. If outside doors need to be open for long periods of time, use insulating Curtains to keep warm or cool air inside.

#### **SHUT OFF EQUIPMENT**

Shut off printers, coffee makers and photocopiers for the night and on weekends. A 20-storey office building with a photocopier, two coffee machines and 10 printers on each floor can lose \$10 000 a year if these machines are left on overnight and over the weekend. Use dedicated circuits for equipment that must be left on.

#### **COMPUTERS**

Shutting off computers each night saves significant amounts of energy. A building with 1000 computers can save over \$170 000 annually. If computers must be left running overnight, shut off computer monitors and printers.



## **Tips on Operating and Maintenance Practices**

### **DELIVERS**

Plan deliveries to reduce the number of trips and overall mileage. Turn off the engine when you are at a delivery point for more than 30 seconds. Avoid rapid starts and stops while on delivery. Use the most fuel-efficient vehicle that can handle the delivery.

### **EXIT SIGNS**

Replacing incandescent bulbs in a building's 100 exit signs with light-emitting diode (LED) bulbs or panels could save \$2000 annually. LED bulbs are affordable, they can be inserted into the same sockets as incandescent bulbs, and they use approximately 2 W of power compared with 30 to 50 W for incandescent bulbs. As well, LED bulbs have a life expectancy of up to 25 years, which substantially reduces maintenance labour and replacement costs.

### **NATURAL LIGHT**

Natural light saves energy and is easier on the eyes. Open curtains and blinds to bring more natural light into your work area. Consider supplementing natural light with a more efficient lighting system that uses less electricity.

### **PHOTOCELLS**

Use photocells to activate outside lighting to ensure that high-wattage outside bulbs are not accidentally left on during the day. Photocells are better than timers as they do not go out of sequence in power failures. Photocells can be used indoors to turn off lighting in offices and areas when there is enough sunlight to illuminate the room. A building with 20 400-W mercury vapour lamps, outside and in the parking lot, would lose \$900 per year if the lights were kept on four hours a day longer than necessary.

## POWER FACTOR

Installing capacitors will increase the power factor on an electricity bill to more than 90%. If the real power is less than 90% of the reactive power, many utilities will charge the billing demand as 90% of the reactive power. For a large building with 6000 kVa of reactive power demand and an 80% power factor, annual savings of \$41 000 could be realized.

## CEILING FANS

Using ceiling fans in rooms with high ceilings will push rising warmer air down to the working area.

## COMPRESSED AIR

A leak in a compressed air line due to holes or poor connections causes the compressor to run excessively, generating unnecessary electrical consumption. A 3/16" hole in a 87 psi line loses more than 0.8 cu. ft./s, which incurs an annual cost of \$7400 for a 300-kW compressor. A single clamp could temporarily solve the problem.

Air pressure should be set at the level needed to best do the job. Consult the technical manual for proper use, then experiment to find the best pressure for the job you perform. You can check your air pressure by reading the gauge in the discharge line of the compressor or holding tank, and then adjusting the pressure controller to lower the discharge pressure to the minimum level required.

When possible, allow products to air dry. Use compressed air to perform only the kinds of jobs for which it was intended.

## DISHWASHER

Replacing the electric booster heater in a restaurant dishwasher with a gas unit can save \$6000 a year.

## E-FILM

A large building with 70 000 sq. ft. of window area can save \$36 000 annually by applying reflective window film (E-Film) to windows. E-Film reduces solar heat gain by 55%, reflects almost all ultraviolet rays (which cause carpeting and furniture to fade), and the high-strength film makes windows almost shatter-proof.

## FAUCETS

Retrofit existing faucets with aerators to reduce water and sewage costs, and to benefit from energy savings that result from lower hot water consumption. An aerator can make the water flow feel stronger while cutting the flow rate in half, generating savings of \$10 000 in water, sewage and heating costs for a 500-room hotel.

## INFRARED HEATING

Use infrared heaters in bay areas and warehouses that have high ceilings. Workers find infrared heating more comfortable and it also reduces condensation.

## LAUNDRY

Use cold water for laundry when possible. A 500-room hotel with an occupancy rate of 75% can save \$16 000 annually by using cold-water detergents.

## LIGHTING REFLECTORS

By using aluminum or silver reflectors in overhead lights to maximize light output, only half the number of light bulbs are required to maintain the same level of brightness. Replacing existing 40-W fixtures with reflective units and using 32-W bulbs on a 20 000 sq. ft. floor can save \$13 000 per year. In addition, the reduced number of lights will mean lower internal heat gain from lighting, which will result in additional savings in air conditioning.

## MOTION DETECTORS

Use a motion sensor or digital timer switch to turn on lights in infrequently used areas such as storerooms. These devices will ensure that lights are turned off when a room is unoccupied. For a building with 10 storerooms (400 W of lighting each, left on 24 h/day), \$2600 could be saved annually.

## RESTAURANTS

Establish a start-up and shut-down schedule for each appliance in the kitchen. This will save utility costs, reduce the heat load in the kitchen and extend the life of the equipment.

## SHOWER HEADS

Replacing 5 gal/min shower heads with 2 gal/min low-flow shower heads in a 500-room hotel can yield annual savings of \$30 000 as a result of water consumption reductions (based on 75% occupancy).

To measure shower head flow, open the faucet to its maximum, place a container under the shower head for six seconds, measure the volume in gallons, and multiply by 10 to determine the number of gallons per minute.

## STAIRWELLS

Replace incandescent lighting in stairwells with compact fluorescents. The payback period on compact fluorescent retrofitting is usually less than a year for areas in which lights are left on 24 hours a day. In a 20-storey building with two exit stairwells, \$4000 a year could be saved.

## STEAM LINES

A 1/8" hole in a 15 psig line will lose over 52 000 lb per month at a cost of \$4000 a year. Make sure all steam lines are properly insulated.

## STEAM TRAPS

A steam trap with a 3/8" orifice on a 100 psig line would lose 470 000 lb per month if it leaks, at a cost of \$35 000 a year.

## THERMOSTATS

Consider lowering the thermostat level in unoccupied rooms or areas. You may even decide not to heat or cool unoccupied rooms at all. Programmable thermostats can be used to reduce the office temperature during evenings and weekends.

## TASK LIGHTING

Overhead lighting in an office can be reduced by using 60-W task lighting at each work station. For a 20 000 sq. ft. floor, \$10 000 per year could be saved.

## TOILET RETROFIT

Retrofitting toilets for water reduction is very affordable, takes only minutes to install and reduces water consumption by up to 60%. A 500-room hotel with a 75% occupancy rate could save \$12 000 per year. (Note: Purchase good quality, proven units to ensure that double-flushing does not occur.)

## T8 LIGHTING

A 20-storey building with an area of 20 000 sq. ft. per floor can save \$120 000 annually by replacing all T12 fluorescent bulbs with energy-efficient T8 fluorescents.

## *Purchasing Strategies*

### COMPUTERS

The next time you purchase a monitor, look for the EPA Pollution Preventer symbol. Monitors with this symbol have an energy-saving "sleep" mode that is activated approximately 15 minutes after there is no activity on the computer. A building with 1000 computers left on overnight could save \$55 000 annually if the computers were equipped with sleep mode. (Note: Screen savers do not save energy; they protect the monitor from "screen-burn." The best way to save energy is to turn off your monitor when it is not in use.)

Make energy efficiency a priority when upgrading computer equipment. The result will be lower electricity bills, less frequent servicing and a more comfortable work space without affecting performance or increasing cost.

## ELECTRIC MOTORS

About 60% of all electricity produced is used to power electric motors. Consider installing high-efficiency motors. They may cost a little more than standard engines but the money saved on electricity soon pays back the difference.

## *Energy Efficiency at Home*

### HEATING

For every degree that your thermostat is set above 20°C (68°F), your heating cost is increased by 5%.

### COOLING

For every degree that your thermostat is set below 20°C (68°F), your cooling cost is increased by 5%.

### HOT WATER

Set the temperature setting on your hot water tank between 55 to 60°C (131 to 140°F), if you have an electric water heater, or 50 to 55°C (122 to 131°F) if you have a natural gas, propane or oil-fired water heater.

### LIGHT BULBS

Fluorescent light bulbs are a bright idea. They use less electricity and last 10 to 20 times longer than incandescent bulbs.

### CAULKING AND WEATHERSTRIPPING

Caulking and weatherstripping are low-cost ways to keep warm or cool air in. Repair caulking around windows and doors and seal all cracks. Keep weatherstripping around all exterior doors and windows in good condition.

### COOLING

Close air conditioning vents to unused areas to redirect airflow into areas that need it most.

### FILTERS

Clean filters, coils and blowers in heating, air-conditioning and refrigeration equipment regularly to improve their efficiency and save on utility costs. Preventive maintenance prolongs the life of equipment and reduces its operating costs.

### WATER LEAKS

Fix leaking pipes and fixtures immediately. At one drop per second, a leaking faucet can lose 175 gallons of water per month, wasting hot water heating costs as well as water volume costs.

### PIPES

Insulate pipes that run through unheated or uncooled areas.

## THERMOSTATS

Use programmable thermostats to automatically lower your home's thermostat while you are sleeping or at work.

Use blinds or insulating curtains to help keep inside temperatures stable throughout the year.

## ENERGY WISE

The EnerGuide label lets you quickly compare which household appliance uses the least amount of energy. Look for the label and save both energy and money.

When shopping for a central air conditioner or a heat pump, compare the seasonal energy efficiency ratio (SEER), which is shown on the back of manufacturers' brochures. The higher the number, the more efficient the unit.

Look for the Energy Star or EcoLogo label when you purchase a personal computer. By turning on the power-management feature you can save \$81 per year. Remember to switch the computer off when you finish using it and your savings could jump to \$137 per year.

## *Energy Efficiency on the Road*

### IDLING

Excessive idling can increase fuel consumption by up to 5%. Even at -20°C, most cars require only 15 to 30 seconds of idling before driving. On warmer days, just start the engine and go. Ten seconds of idling consumes more fuel than restarting your engine.

## SPEED

Try to avoid rapid acceleration and high speeds. A vehicle travelling at 130 km/h consumes about 40% more fuel than a vehicle travelling between 90 and 100 km/h. Driving faster consumes more fuel.

## BRAKING

Anticipating the flow of traffic increases fuel efficiency. Minimizing brake usage by maintaining at least a two- to three-second buffer zone between cars preserves momentum in city driving and results in safer road travelling. By gently applying the brake, gas mileage can be improved by up to 25%.

## MAINTENANCE

Have your car serviced in the spring and fall and tuned as recommended by the manufacturer. A poorly maintained vehicle consumes up to 15% more fuel.

Inflate your tires to the pressure recommended by the manufacturer. Check tire pressure once a month and keep an eye out for uneven tread wear. Remember, under-inflated tires substantially increase fuel consumption.

*For further information, visit our web site or contact us at:*

**Office of Energy Efficiency  
Natural Resources Canada  
580 Booth St., 18th Floor, Ottawa,  
ON K1A 0E4  
Fax.: (613) 943-1590  
Web site: <http://oe.nrcan.gc.ca>**

