



## Conserving Energy

(REVISED AND REPRINTED FROM *HANDS-ON SOLUTIONS TO IMPROVE YOUR PROFITS AND PRODUCTIVITY*  
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Compared to incandescent lighting, energy efficient light bulbs use less energy, last about ten times longer, and can be installed in most light fixtures.

One of the best ways for us to improve our global environment is to use energy more efficiently. If each one of us is more selective in the types of appliances and equipment we purchase, the effect will be remarkable. We'll not only see a dramatic affect on our environment, but we'll save on our monthly utility bills as well.

### Lighting

Lighting is the largest user of electricity and the easiest area in which to save.

- **Energy-efficient fluorescent lamps**  
Many properties are lowering their lighting bills by installing energy-efficient equipment such as fluorescent and compact fluorescent lamps, task lighting, and lighting controls.
- **Electronic ballasts**  
When replacing standard fluorescent lights with energy-efficient lamps, it's necessary to replace the existing ballasts. When doing so, be sure to specify electronic ballasts. They operate 75% more quietly than conventional ballasts, eliminating the familiar flicker and hum of older fluorescent lights. Simple payback periods on these improvements can be as short as 1 to 2 years.
- **Task lighting**  
Task lighting is simply lighting the areas where you need light, rather than the entire area. In other words, use smaller, more efficient lights that bring the light source closer to the work area requiring illumination. This concept applies to such areas as offices, workrooms, and garages.
- **Compact fluorescent lamps**  
Compact fluorescents are a good alternative to incandescent light bulbs. They last about 10 times longer than incandescent lamps. Lights that operate much of the time, such as in hallways or stairwells, are popular applications for compact fluorescent lamps.
- **Lighting controls**  
Manual controls can be used in spaces that accommodate different tasks or that have access to daylight. In this way, occupants can manually shut lights off when they aren't needed. Automatic controls such as occupancy sensors are convenient for turning lights off when certain areas, such as restrooms, are unoccupied. Auto dimming controls are available that automatically adjust light levels according to existing daylight.

- **Reflectors**

Reflectors can increase the effectiveness of a fluorescent lighting fixture by about 10% in some situations by reflecting additional light on the workspace. Reflectors installed with energy-efficient fluorescent lamps and electronic ballasts can reduce lighting energy costs by as much as 70%.

## Compact Fluorescents

Compact fluorescent bulbs are just what their name describes—compact versions of the fluorescent lighting common in schools and office buildings. They come in many shapes and sizes, fit most lighting fixtures, and provide light similar to conventional light bulbs.

Compact fluorescent bulbs use about one-quarter of the electricity to provide the same light as an incandescent bulb. A 20 watt compact fluorescent bulb provides the same light as a 75 watt incandescent bulb. The typical life of a compact fluorescent is 10,000 hours, compared to 750 to 1,000 hours for an incandescent. This means a compact used for an average of four hours daily would last for seven years.

Compact fluorescents cost more than incandescent bulbs, but are definitely worth the investment. They use less energy, last about ten times longer, and can be installed in most light fixtures. Make sure you measure the space that you have before you buy a compact fluorescent because they vary in size and shape.

New York State Energy Office

## Building

Your building probably has room for low-cost energy efficiency improvements. Besides saving you money, these improvements lead to greater comfort for everyone. When you evaluate how your building is using energy, you may find many opportunities for efficiency improvements.

- **Stop leaks**

One of the easiest and quickest dollar-saving techniques is caulking leaks. Heat always flows from a warmer environment to a cooler one; when it's cold outside, heat tends to leak outward. Eliminating leaks in walls, windows, doors, ceilings, and floors works to your advantage for both heating and cooling. When it's windy outside, your ears or sense of touch may guide you to substantial leaks.

- **Check doors, windows, and other openings**

A few simple measures can really help prevent leakage. For example, replace any broken or cracked glass. Use automatic door closers; be sure they're adjusted for proper operation, and replace them when necessary. Use an exterior insulating cover on window-mounted or above-door air conditioners during winter. Finally, make certain the space around your air conditioner is thoroughly sealed.

- **Isolate unused spaces**

Your building may contain space that isn't used by people. Isolate these areas by closing heating and cooling vents and covering exterior windows. Sealing unused exterior windows and doors can represent a valuable security benefit, too.

## Heating, ventilating, and air-conditioning (HVAC)

You probably spend many energy dollars on heating and cooling your building. Comfort is a high priority and product quality may dictate certain temperature requirements. Properties have found that the following basic steps can save energy and increase comfort.

- **Programmable thermostats**

These simple microprocessor-based products offer as much as a 50% rate of return on energy dollars. In addition, these devices will maintain system start-up and set-back schedules for optimum comfort. They can also eliminate unnecessary HVAC use during unoccupied hours.

- **Furnace maintenance and repair**

An easy first step is to replace dirty air filters. It's often well worth the expense to have a trained specialist inspect and perform needed maintenance on your furnace and cooling system. Also, simple maintenance such as cleaning intake screens, condenser coils, supply registers, and return grills can make a difference in your energy bills.

- **Duct maintenance and repair**

Typical duct systems lose energy from your heating and air-conditioning equipment. Use duct tape to seal duct joints and elbows where accessible. Insulate any ductwork in unconditioned space, such as roofs, attics, crawl spaces, and basements. Identify and repair damaged or disconnected ducts while you check the system.

- **Boilers**

If you use a boiler for heating, follow the maintenance schedule and procedures. If maintenance costs for your existing boiler have become excessive or you need to replace your boiler, replace it with a high-efficiency model.

- **Ventilation rate**

Building ventilation is necessary so that you have a reasonable supply of fresh air. However, excessive ventilation rates increase your heating and cooling costs dramatically. Have a professional engineer or trained specialist optimize your system's ventilation rate.

- **HVAC and solar**

You may also be able to save energy by managing the sunlight that falls on your structure. Solar hot water systems and solar heating systems are two potentially economical solar energy technologies you might want to consider.



Insulating hot water pipes reduces heat loss, allowing the heating temperature to be lowered without reducing the optimal temperature.

## Hot water supply

Your hot water temperature is often set higher than you really need. Gradually set the temperature downward until you reach an optimum. You can also install flow restrictors and self-closing faucets to reduce your hot water use. Finally, check your entire system for leaks and repair them.

One of the most effective measures you can use is an insulating jacket for the water heater. These jackets are easily found at large convenience, building, and hardware supply stores. A simple electronic time-of-use controller will ensure that your electric water heater is off when not needed.

## Equipment and appliances

It takes less electricity to run energy-efficient equipment; using energy-saving equipment also saves on air-conditioning costs because the equipment produces less waste heat. More efficient equipment can also increase comfort by cooling areas more uniformly and reducing HVAC system noise.

- **Buy energy-efficient equipment and appliances**  
Look for energy efficiency to help you select products in a sometimes confusing marketplace.
- **Refrigerator**  
Move your refrigerator out from the wall and vacuum its condenser coils. Clean, or if necessary, replace the door gasket. Cool hot foods before placing them in the refrigerator.
- **Stove and Oven**  
Use toaster or microwave ovens for small items. Use pressure cookers or crock pots.
- **Washer and Dryer**  
Wash laundry in cold water. Wash and dry full loads. Clean the lint filter in your dryer after every load. Let laundry drip dry.
- **Turn off equipment and appliances**  
About 30% to 40% of personal computers and printers are left running at night and on weekends, and these machines are idle as much as 90% of their workday on time.

Don't be confused by so-called screen savers. They do not save electricity in computer monitors; they are meant to prevent phosphor "burn-in" on the screen.

Cycling power on and off to your computer will not harm late-model machines. Energy Star computers, monitors, and printers can automatically power down to save electricity when not in use. Don't forget to consider sharing printers and copiers; this will decrease their idle time and provide for more cost-effective use of the equipment.

## Off-peak hours

Electric power suppliers are able to produce electricity more economically during off-peak hours and can charge a less expensive rate. Check with your local power company to determine if they offer separate meters that monitor electricity used during off-peak hours.

Putting appliances such as hot water heaters and washing machines on timers set to run during off-peak hours will allow you to reduce electric bills.

In the case of Lakeview Golf Course, off-peak power is now used to charge golf cart batteries. The cost is 3.3 cents an hour, compared to 7.5 to 8 cents during peak hours - a 60 percent savings.

The initial up-front cost was higher, but, according to Diane Bird of Lakeview Golf Course, the company has "more than recovered" the cost of installation through saved electric costs in the year it has used it.

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## Solar Energy

You can use the sun's energy to maximize natural lighting and heating, which will decrease costs for artificial lighting and space heating. On the other hand, you may live in a very warm, sunny climate where air-conditioning is your building's greatest energy expense. In that case, you'll want to minimize the effects of the sun's energy.

- **Direct sunlight: enhancement or control**

Sunlight striking your building can work for you or against you. When you are trying to cool your building, you don't want sunlight pouring in through windows, doors, and skylights, adding considerably to your air-conditioning bills. However, when you are heating your building, you want the sunlight to enter.

During the air-conditioning season, provide shading to windows, doors, and skylights. This can be done effectively with awnings, sunscreens, shade trees, and shrubbery. During the heating season, you can save money by permitting sunlight to enter the building through windows and other openings.

- **Solar hot water systems**

Large water-heating needs can be economically and reliably met by solar energy. Depending on the cost of your current water-heating system and its energy source (oil, electricity, natural gas, or propane), basic solar water heating or preheating may make economic sense.

- **Solar heating systems as supplements to HVAC systems**

In most areas, an all-electric heating system will be expensive to operate and will leave you vulnerable to power outages and ever-increasing energy rates.

Supplemental space heating is efficiently provided by the transpired solar collector, a type of solar collector that heats air for the building. In 1994, this new collector received a "Best of What's New" award from Popular Science (February 1994, page 20). This system has been effectively demonstrated, meeting winter head-on in Canada. Check with local or state energy offices, local utilities, energy properties, universities, or your accountant for the availability of state tax incentives or technical assistance to those using solar water heating systems.

## Helpful Web Sites

- [www.botany.uwc.ac.za/EnvFacts/index.htm](http://www.botany.uwc.ac.za/EnvFacts/index.htm)
- <http://www.ase.org>
- <http://www.airhead.org/>
- <http://www.eia.doe.gov>
- <http://www.nef1.org/academy.html>
- <http://www.eren.doe.gov>

# Energy Conservation Survey

## Energy Efficiency

CHECK ALL THAT YOU HAVE INSTALLED:

- Compact fluorescent lights
- 10%    25%    50%    75%    Other
- Energy-efficient or *Energy Star* appliances
- 10%    25%    50%    75%    Other
- Energy efficient or *Energy Star* computers
- 10%    25%    50%    75%    Other

## Energy Conservation

CHECK ALL THAT YOU HAVE IMPLEMENTED:

- Hot water thermostat turned down to 120-degrees
- Hot water tank and pipes insulated
- Low flow shower and faucet aerators
- Thermostat turned down at night to 55-degrees
- Thermostat set for day-time temperatures of 65- to 68-degrees
- Central air thermostat set at 78-degrees
- Lights turned off when not in use
- Task lighting used in place of overhead lighting when possible
- Appliances and equipment turned off when not in use
- Water heater turned off overnight and on weekends

## Insulation

CHECK FEATURES WHERE YOU HAVE UPGRADED INSULATION TO ELIMINATE DRAFTS:

- Windows
- Doors
- Wall Joints
- Attic or roofing
- Exterior walls
- Outlet and switch plates
- Floors

## Conservation Maintenance

CHECK ALL THAT ARE PART OF YOUR REGULAR ROUTINE:

- Heating pipes and ducts kept in good repair
- Appliances cleaned annually as appropriate
- Oil or gas burner tuned up annually
- Air filters cleaned monthly