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to improve your electric bill

► More Than 100 Ways To Improve Your Electric Bill

The way you use electricity at home offers great opportunities for using energy wisely. For example, did you know that you can reduce your electricity usage for lighting by 75 percent just by replacing your incandescent light bulbs with compact fluorescent bulbs? Or, that you can reduce your cooling bill by 2 percent just by raising your thermostat by 1 degree in the summer? Likewise, in the winter, lowering your thermostat by only 1 degree can reduce heating bills by 3 percent.



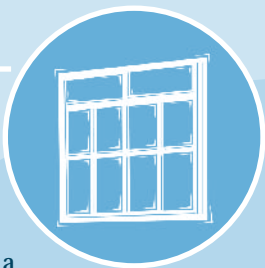
These are just three ways you can save energy and money! This booklet offers you more than 100 ways to improve your electric bill by saving energy in the major areas of home heating, cooling, lighting, cooking, water heating, laundering, and refrigeration.

These simple, low- or no-cost tips can assist you in making your energy decisions and in gaining greater control over your electric bill. By following these tips, you will also improve the comfort and convenience of your home. And you'll help to protect the environment by using energy wisely.

By improving the energy efficiency of your house in 2006 and 2007, you may qualify for federal tax credits! You can get tax credits for installing new insulation, high-efficiency appliances, new windows, and high-efficiency heating and cooling equipment.

Please read the booklet carefully and take advantage of the tips when and where you can. Even more, remember that many energy companies offer advice and assistance in each of these areas. These companies can do on-site energy audits, offer incentives on efficient appliances, conduct Internet-based home energy audits, or provide information on using electricity more efficiently in your home. Call or e-mail your local energy company to find out more!

INSULATION



- The single most important step in residential energy conservation is the installation of thermal insulation. Check current insulation levels, and properly insulate a new or existing home according to the updated U.S. Department of Energy's specifications for your geographic area. Insulate ceilings, walls, and floors over unconditioned crawl spaces.
- Double-glazed windows (two panes of glass separated by a sealed air space) cut heat transfer by 40 to 50 percent. In extremely cold regions, triple glazing could be economically justified.
- Single-glazed windows should have storm windows. A wood or metal frame storm window provides a second thickness of glass and a layer of still air that reduces heat transmission markedly.
- Install storm doors at all entrances of the house. A storm door helps save energy because it reduces the mass of air infiltration that occurs when the prime door is opened and also reduces the amount of heat transfer through the prime door when it is closed.
- Weatherstrip and caulk around all entrance doors and windows to limit air leaks that could account for 15 to 30 percent of heating and cooling energy requirements.
- In the winter, the air is normally dry inside your house. This is a disadvantage because, to be comfortable in dry air, people typically require a higher temperature than they would in a humid environment. Therefore, efficient humidifiers are a good investment for energy conservation.

Increasing insulation and upgrading to ENERGY STAR® rated windows may qualify you for a federal tax credit worth 10 percent of the cost of the improvements. The limit on the tax credit for improving the building envelope is 10 percent, up to \$500. For windows, the tax credit limit is 10 percent up to \$200. These credits are available for 2006 and 2007.

For more information on insulation, please visit www.energysavers.gov.

AIR INFILTRATION

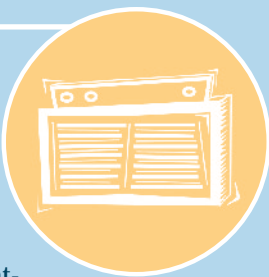
- Find the obvious places where air can sneak into your home, then make repairs to plug the leaks by caulking, weatherstripping, and using plastic covers.
- Some of the major air leakage areas for the average home are: air ducts; window sashes and frames; fireplaces; door sashes and frames; plumbing utilities and wall penetrations; furnace flues; attic entrances; wall outlets; and recessed light fixtures.
- Keep the overhead door of an attached garage closed to block cold winds from infiltrating the connecting door between the house and garage.
- Fireplaces should have tightly fitting dampers that can be closed when the fireplace is not in use. Open dampers allow the natural draft of chimneys to pull warm air out in winter and cool air out in summer.

For more information on air infiltration and insulation, check out the following Web sites: www.insulate.org, www.naima.org, and www.nfrc.org.

Energy You'll Save

Properly caulking and weatherstripping your doors and windows reduces heating and air conditioning usage by 10 to 20 percent.

COOLING



- Air conditioners vary considerably in efficiency and in the amount of energy used. Therefore, select equipment based on its federal energy efficiency rating. For window units, this rating is the Energy Efficiency Ratio, or EER. New standards for room air conditioners went into effect on October 1, 2000. For many types of room air conditioners, the minimum EER will be 9.0 or 9.7. As a general rule, an EER of 11 or more is excellent.
- Central air-conditioner units are rated on their Seasonal Energy Efficiency Ratio, or SEER. A rating of 14 SEER is excellent, and the minimum cooling efficiency for air conditioners and heat pumps is 13 SEER. An ENERGY STAR® unit will have a SEER level of 14 and an EER of 11.5.
- Seek professional help in determining the size of cooling equipment needed. Oversized units especially are to be avoided not only because they draw more energy than is necessary, but also because they cannot dehumidify properly.
- Locate the compressor units of central air-conditioning and heat pump systems in an outside area that is shaded by the house or by trees and plants. Units should be kept clean and free of any plant or tree overgrowth.
- Direct sunlight falling on a window air-conditioning unit increases its workload. When a choice is possible, locate such units on the north or shady side of the house.
- Set the cooling thermostat as high as comfort will permit. The higher the setting, the more energy you save.

In 2006 and 2007, you can qualify for a federal tax credit of \$300 if you purchase a heat pump rated at 15 SEER and 13 EER or a central air conditioner rated at 15 SEER and 12.5 EER.

- Attics must be ventilated to relieve heat buildup caused by the sun. When planning a new home, install vents of proper size and location to ensure attic ventilation by natural airflow. For existing homes, determine whether attic ventilation is adequate and, if necessary, improve airflow by adding or enlarging vents.
- Choose light-colored roof shingles for your house to reflect more of the sun's heat. The darker the shingles, the more heat that will be absorbed during the summer season.
- Open windows during the moderate weather of spring and fall to admit outside air for cooling instead of operating air-conditioning equipment.
- Close cooling vents and turn off window air conditioners in unused rooms. Keep doors to unused rooms closed.
- Draw blinds, shades, or drapes to block the sunlight during the hottest part of the day, especially on south- and west-facing windows.
- In the cooling season, run kitchen and bath exhaust fans only long enough to rid the house of unwanted water vapor and odors.
- Don't position heat-producing devices such as lamps and TV sets beneath a wall-mounted thermostat for a central cooling system. Heat rising from the equipment could cause the thermostat to read a temperature higher than the true room temperature and lead to overcooling.

For more information on cooling, check out the following Web sites: www.geoexchange.com, www.ari.org, and www.energystar.gov.

Energy You'll Save

Replacing an old central air conditioner (SEER rating of 10 or less) with a new high-efficiency unit (SEER rating of 13 or more) saves at least 25 percent on cooling bills.

HEATING

- If you are buying a new heating system, consider a high-efficiency electric air source or ground source heat pump. The energy efficiency is rated according to a federal standard called the Heating Seasonal Performance Factor, or HSPF. Heat pumps with an HSPF of 10 are almost three times more efficient than the most efficient gas furnaces. New standards for heat pumps took effect in January 2006. In January 2006, the new minimum efficiency for air source heat pumps rose to 7.7 HSPF.
- Ground source heat pumps, or GeoExchange units, use the Earth as a heat source in the winter and as a heat sink in the summer. Ground source heat pumps are rated in terms of Coefficient of Performance (COP) for the winter. The higher the COP, the higher the efficiency. Where gas furnaces have COP values in the 0.78 to 0.94 range, ground source heat pumps have COP values in the 3.0 to 4.0 range.
- In the heating season, water vapors from bathing and cooking are beneficial because they help humidify the home. So, use kitchen and bath exhaust fans sparingly in the winter to keep as much heat as possible inside your house.
- Locate the heating thermostat on an inside wall and away from windows and doors. Cold drafts will cause the thermostat to keep the system running even when the rest of the house is warm enough.

In 2006 and 2007, you can qualify for a federal tax credit of \$300 if you purchase an ENERGY STAR® ground source heat pump that includes a desuperheater (to reduce water heating costs).

Energy You'll Save

Installing a ground source heating and cooling system, such as a Geo-Exchange system, reduces heating and cooling bills by 30 to 50 percent.

- Set the heating thermostat as low as comfort permits. For instance, each degree over 68° F can add 3 percent to the amount of energy needed for heating. If you have a heat pump, make sure that the thermostat is designed to operate the heat pump efficiently when raising the temperature after it has been lowered.
- When entertaining a large group of people during the heating season, lower the thermostat a degree or two before the guests arrive. Otherwise, since people generate heat, the space may become wastefully overheated.
- Lubricate pump and blower bearings regularly in accordance with manufacturers' recommendations to limit the amount of energy lost to friction and to extend equipment life as well.
- Close heating vents and radiator valves in unused rooms. Make sure that drapes, plants, or furniture do not block registers for supply or return air.

In 2006 and 2007, you can qualify for a federal tax credit of \$300 if you purchase a central heat pump system that has efficiency ratings of 15 SEER and 13 EER on the cooling side, and 9.0 HSPF on the heating side.

For more information on heating, check out the following Web sites: www.geoexchange.com and www.energystar.gov.

FOOD REFRIGERATION

- Select refrigerator and freezer sizes that are just large enough for your family's needs. Operating energy is proportional to cubic feet of refrigerated space, regardless of whether all of the space is utilized.

- Consider replacing your refrigerator or freezer BEFORE it breaks down. Look for the ENERGY STAR® label when shopping for refrigerators or freezers. On average, ENERGY STAR® refrigerators use at least 12 percent less energy. New standards for refrigerators took effect on July 1, 2001.



- NEVER put a second refrigerator in the garage. In the winter months, frozen foods may melt (as the temperature sensor in the refrigerator will not activate the compressor if the temperature in the garage is 42° F or lower). In the summer months, the temperature in the garage can easily exceed 100° F, and the refrigerator has to work extra hard to keep food cold. If you need a second unit, place it in your basement.
- On older units, vacuum clean the condenser coils of refrigerators and freezers (in the back or at the bottom of cabinets) every three months or so. Dust-covered coils impair the efficiency of compressor operation and increase energy usage.
- Door gaskets on refrigerators and freezers should seal tightly against the frames to prevent infiltration of warm air. To check the condition of the gasket, place a dollar bill against the frame and close the door. If the bill can be pulled out with a very gentle tug or, worse still, simply drops out on its own, the door requires adjustment, or the gasket needs replacing.
- Some older refrigerators are furnished with a power-saver switch. A heating element provides a small amount of heat that prevents moisture condensation around the edges of the door. Try turning the switch off; condensation, if any, may be slight and unobjectionable. If this is the case, save energy by keeping the switch off.

In 2006 and 2007, manufacturers of high efficiency refrigerators qualify for tax credits. This should increase the supply and number of ENERGY STAR® units on the market, which may lower the retail prices of high efficiency refrigerators in 2006 and 2007.

Energy You'll Save

Replacing an old refrigerator (18 years or older) with a new unit reduces electric usage by at least 35 percent. Because they are more efficient than standard models, ENERGY STAR® units will lower refrigeration energy usage even more – by over 45 percent.

- When buying a new refrigerator, look for new energy-saving features such as the power-saver switch and improved insulation materials. These features can save as much as 10 percent in annual consumption of electricity.
- Do not place uncovered liquids in refrigerators. In addition to absorbing undesirable flavors, the liquids give off vapors that add to the compressor workload.
- Allow hot foods or liquids to cool off before placing them in the refrigerator. The cooling off period should not hurt the taste of the food and will reduce the load on the refrigerator.
- Plan ahead and remove all ingredients for each meal at one time. Each time the door of a refrigerator or freezer is opened, its compressor has to run a bit longer to replace the cold air that spills out.
- Chest-type freezers are less likely to lose cold air when doors are opened than upright freezers.
- For the same storage capacity, chest-type freezers use anywhere from 11 to 27 percent less energy than upright freezers.

For further information on refrigeration, check out the following Web sites: www.aham.org and www.energystar.gov.

COOKING

Range Tops

- To cook efficiently, heat must be transferred from the electric cooking element to the food with minimum loss to the surroundings. To help do this, select pots and pans with absolutely flat bottoms. Spherical bottoms leave an air gap that provides a ready escape route for heat.
- Expand your family's menus to include stews and other single-dish meals that can be prepared in a slow cooker. Such meals require far less energy than those calling for the simultaneous use of the oven plus two or three surface units.



- Develop the habit of “lids-on” cooking. Tightly fitted lids help keep heat within pots and pans, permitting the use of lower temperature settings and shorter cooking times.
- Reflector pans beneath stovetop-heating elements should be kept bright and clean. Shiny pans help focus heat rays on utensil bottoms; dull or soiled pans absorb heat wastefully.
- Begin cooking on highest heat until liquid begins to boil. Then lower the heat control setting and allow food to simmer until fully cooked.

Ovens

- Use your microwave oven whenever possible. Microwave ovens draw less than half the power of their conventional counterparts and cook for a much shorter period of time. For example, an item that needs to be cooked in a full-sized oven at 350° F for one hour will take only 15 minutes to cook in a microwave on the “high” setting.
- Rather than using the oven for preparing small quantities of food, consider cooking in small portable electric appliances such as a frying pan, grill, or toaster oven. On average, these use only about one-third of the electric power of an oven broiler.
- When operating an electric oven, attempt to cook as much of the meal in it at one time as possible. Foods with different cooking temperatures can often be cooked simultaneously at one temperature – variations of 25 degrees in either direction still produce good results and save energy.
- When preheating an oven for baking, time the preheat period carefully. Five to eight minutes should be sufficient. There is no need to preheat for broiling or roasting.

Energy You'll Save

Using a microwave oven can reduce your energy used for cooking by over 50 percent.

- Rearrange oven shelves before turning the oven on. To do this after the oven has preheated not only allows wasteful escape of heat but poses a burn hazard as well.

- When roasting or baking, avoid making frequent progress checks that entail opening the oven door. Each time the door is opened, a considerable portion of the oven's heat escapes.



- Activate the self-cleaning cycle on an electric oven only for major cleaning jobs. Wipe up minor spills and splatters with a damp cloth. When self-cleaning is necessary, start the cycle right after cooking, while the oven is still hot, or wait until late evening hours when use of electricity is lowest.

- Never use an open electric oven as a room heater or as a source of warm air for drying rain-dampened outerwear. If the kitchen is furnished with the type of refrigerator or freezer that exhausts warm air through a front floor-level grille, damp shoes can be dried quite nicely and at no energy cost by placing them on the floor near the grille.

WATER HEATING

One of the biggest energy users in your home, next to heating and cooling systems, is your hot water system.

- New federal efficiency standards for electric and gas water heaters took effect in January 2004. Make sure your new water heater meets or exceeds the new Energy Factor (EF) standard. (Examples: 0.90 EF for an electric 50-gallon unit, 0.59 EF for a gas 40-gallon unit.)

- It is important to keep the system properly maintained. Once or twice a year, drain a bucket of water out of the bottom of the heater tank because it is sometimes full of sediment. The sediment insulates the water in the tank from the heating element, which wastes energy.

● In addition, you might want to investigate a relatively inexpensive water heater insulation kit. Older hot water tanks (except super-insulated tanks) generally are not insulated very well, so an extra layer of protection will keep the heat from being lost through the walls of the tank. Be sure to read the instructions on the kit carefully. Do not insulate over any doors, vents, or relief valves.

● When buying a water heater, it is wise to correctly estimate your needs. Don't buy a water heater that is too large for your family, but you should consider your future needs as well as your present requirements. Demands for hot water will be greater as the size of your household increases, as your children become older and begin to take showers or soak for hours in a full tub of water, and as certain new appliances (such as hot tubs or Jacuzzis) are added.

● In sprawling ranch houses or in residences with two or three levels, the rooms requiring hot water may be widely separated. It may be possible to get better hot water service with less use of electricity by having two or more water heaters—one heater in each principal water-using area—instead of one heater in a central location.

● Consult with a plumber to determine if your water heater meets the needs of your family. This table includes the electric water heater sizes usually considered adequate for various family sizes:

Family Size	Electric Water Heater Capacity
1 to 4	30, 40, or 50 gallons
4 to 7	50 or 80 gallons
7 or more	80 gallons or more

In 2006 and 2007, you can qualify for a federal tax credit of \$150 for buying a high-efficiency gas, oil, or propane water heater. You can also qualify for a \$300 federal tax credit for buying an electric heat pump water heater with an energy factor (EF) greater than 2.0.

● Repair leaky faucets promptly. A steady drip of hot water can waste many gallons of water per month, plus the energy needed to heat the water.



● Letting the water run while shaving or when washing dishes by hand is needless waste. Avoid this by using sink stoppers and dishpans.

● Encourage family members to take showers rather than baths. The average person will use about half as much hot water in a shower as in a bath.

● The standby heat loss of a water heater increases with temperature. So, set the temperature control of your water heater at a moderate 120° F, or as low as possible without running out of hot water. If you need hotter water for certain functions, such as dishwashing, consider a dual-temperature system. Such systems employ a central unit supplying 120° F or lower temperature water for general purposes plus a second, smaller water heater set for a higher temperature.

● Locate water heaters as close to the points of hot water use as possible. The reason for this is that any hot water that remains in a supply pipe after a tap or valve is closed eventually cools off and is wasted. The longer the supply pipe, the more heat lost.

● When long lengths of hot water supply pipe are unavoidable, insulate them to reduce losses. Hardware stores sell hot water pipe insulation kits.

● Look for dishwashers with internal booster heaters, so that you can set your water heater thermostat at 120° F (rather than 140° F or higher for dishwashing purposes).

For more information on water heating, check out the following Web sites: www.gamanet.org and www.energystar.gov.

Energy You'll Save

Lowering your water heater temperature setting from 140° F to 120° F can reduce your water heating energy bill by over 10 percent.

LIGHTING

- Provide “task” lighting (over desks, tool benches, sewing tables, etc.) so that work and leisure activities can be carried on without illuminating entire rooms.
- Select the type of light bulb on the basis of its efficiency. Compact fluorescent bulbs will give an incandescent bulb’s warm soft light, while using 75 percent less electricity. They also last about 10 times longer. Use these bulbs in fixtures or lamps that are on for more than two hours each day.
- Some compact fluorescent bulbs can be used with dimmer switches. Check the package to make sure they can be used with dimmers. Where possible, consider using dimmable compact fluorescent bulbs.
- Instead of using a 190-watt or 300-watt halogen torchiere to light up a room, consider a compact fluorescent torchiere that will produce as much light, and use less than 80 watts.
- The reflectance of interior surfaces has an important bearing on lighting efficiency. In home decoration, therefore, choose lighter colors for walls, ceilings, floors, and furniture. Dark colors absorb light and would require higher lamp wattage for a given level of illumination. Light-colored surfaces should be kept clean to keep reflectance levels high.
- In lamps and fixtures having two or more sockets for incandescent bulbs, consider using a single large bulb in one socket rather than filling all sockets with bulbs of smaller wattage. A 100-watt bulb, for instance, produces 50 percent more light than four 25-watt bulbs for the same amount of energy. Using compact fluorescent bulbs will save more energy. Typically, a 23-watt compact fluorescent bulb can replace a 90- or 100-watt bulb.
- Many so-called “long life” bulbs emit significantly less light than a standard incandescent bulb of the same wattage. They should be used only where the long-life feature is advantageous, as in hard-to-reach places, or where it is not possible to use compact fluorescent bulbs.
- When possible, locate floor, table, and hanging lamps in the corner of a room rather than against a flat wall. Lamps in corners reflect light from two wall surfaces instead of one and, therefore, give more usable light.

- Clean lighting fixtures regularly. Dust on lamps and reflectors impairs lighting efficiency.

- For large areas such as family recreation rooms, where high levels of lighting are required periodically but not 100 percent of the time, install fixtures on two or three separate circuits so illumination can be controlled by switching circuits on and off.

- When purchasing light bulbs, the wattage ratings tell you only the amount of power it takes to make a bulb work. The amount of brightness is measured in lumens. Larger wattage bulbs are usually more efficient, whether incandescent or compact fluorescent, producing more lumens per watt than smaller bulbs.

- To make sure that outdoor lighting is turned off during the daytime, install photoelectric controls or timers.

- Consider using compact fluorescent bulbs in outdoor fixtures. Many bulbs will produce light down to an outdoor temperature of 0° F.

- If you are on vacation, and have a timer on a lamp for security reasons, use a compact fluorescent bulb to save energy. Make sure the timer is compatible with the bulb.

Note: As of January 1, 2006, federal law mandates that the maximum power use of torchiere light fixtures can be no more than 190 watts. If you purchase a torchiere, make sure that your fixture meets the new requirements.

More information about high-efficiency lighting is available through lighting manufacturer Web sites and at www.energystar.gov.

LAUNDERING

Washers

- A new federal efficiency standard for clothes washers took effect in January 2004. Make sure your new clothes washer meets or exceeds this standard, which is a Modified Energy Factor or MEF of 1.04. In January 2007, the efficiency standard rises to 1.26 MEF.



- Follow detergent instructions carefully. Oversudsing actually hampers effective washing action and may require more energy in the form of extra rinses.
- If you are in the market for a new washing machine, consider using a front-loading or horizontal axis washing machine. According to studies by the U.S. Department of Energy, these new units use 30 percent less water and 50 percent less energy to make hot water and wash clothes than regular washing machines. They are also gentler on fabrics.
- Set the wash temperature selector to cold or warm and the rinse temperature to cold as often as possible. Sort laundry and schedule washes so that a complete job can be done with a few cycles of the machine carrying its full capacity rather than a greater number of cycles with light loads.
- In terms of features, when shopping for a clothes washer, look for several water level options (to adjust to different loads). Also, look for pre-soaking and suds saver options.
- Washing machines with higher spin speeds can extract more water and reduce drying time, which saves more energy.

In 2006 and 2007, manufacturers of high efficiency clothes washers qualify for tax credits. This should increase the supply and number of ENERGY STAR® units on the market, which may lower the retail prices of high efficiency clothes washers in 2006 and 2007.

Dryers

- Avoid over-drying. This not only represents a waste of energy but harms fabrics as well.

Energy You'll Save

Using new horizontal-axis clothes washers (also called “front loaders”) will reduce water usage by over 30 percent and lower energy used for washing and making hot water by 50 percent.

- Many dryers have settings that allow an automated moisture sensor to reduce the drying time. Dryers with automated moisture sensors may have a buzzer or other sound system to let you know when clothes are dry. Use the sound system to minimize drying time.
- To save energy, try not to run the electric dryer unless it is carrying its rated poundage of clothes. Don't overload, however, since this causes excessive wrinkling and perhaps requires an added amount of ironing.
- Dry towels and heavier cottons in a separate load from clothes with lighter weights.

DISHWASHING

- Soak or pre-wash only in the cases of burned-on or dried-on foods.
- Be sure that the dishwasher is full, but not overloaded.
- Don't use the "rinse hold" feature on your dishwasher when you only have a few soiled dishes.
- Overall, dishwashers use less water than washing dishes by hand. For a full load of dishes in the dishwasher, washing the same dishes by hand would typically use at least 6 more gallons of hot water.
- Look for the ENERGY STAR® label when purchasing a new dishwasher. New criteria will be effective on January 1, 2007, which will make ENERGY STAR® units more than 35 percent more efficient than baseline units.



In 2006 and 2007, manufacturers of high-efficiency dishwashers qualify for tax credits. This should increase the supply and number of ENERGY STAR® units on the market, which may lower the retail prices of high-efficiency dishwashers in 2006 and 2007.

For more information on high-efficiency dishwashers, check out the following Web sites: www.aham.org and www.energystar.gov.

OTHER APPLIANCES

● Screen savers may save screens, but they do not save energy. Make sure that the screen saver does not deactivate your computer's sleep mode. You can set the computer to operate the screen saver, then go into the sleep mode.



● Look for the ENERGY STAR® label when shopping for a variety of appliances, such as dehumidifiers, compact fluorescent lamps, a new television, VCR, DVD player/recorder, cordless phone, or home stereo system such as a “boom box.”

● The ENERGY STAR® label is also used for computers. Look for it when shopping for a new computer, computer monitor, printer, scanner, or fax machine. Information on ENERGY STAR® computers is detailed at the www.energystar.gov Web site.





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