

## **DO IT YOURSELF ENERGY AUDIT**

Taking control of your energy use is probably easier than you realize. That's because you have almost complete control over which appliances and electrical devices in your home will operate and for how long. It sounds simple, but of course there are some things you can't just turn off and leave off. There has to be a balance between comfort, convenience and cost. And where that balance lies is completely different with each family in each home.

In an effort to help you determine how to keep your electric bills lower while maintaining a reasonable level of comfort and convenience, Laurens Electric Cooperative has produced this booklet which contains articles, suggestions and methods for reducing your usage of electricity.

The job of a comprehensive energy use study is enormous, but with this book as a guide, homeowners can take a look at the major energy use factors in their homes and have a good starting point for reining-in those high bills. If, after you've gone through this book, you would like additional assistance in this area, Laurens Electric has trained personnel ready to help you.

### **What is a kilowatt-hour?**

To have a basic understanding of energy use in your home and how to curb it, it is essential to have a basic understanding of the kilowatt-hour. An appliance's wattage, put simply, is the amount of power it consumes per hour of use. That unit is important because it is used in determining the kilowatt-hour usage of your home, and therefore, your bill.

To figure out how much energy a particular appliance in your home uses, simply find the wattage of that appliance (it should be listed somewhere on the appliance). If the wattage is not shown, it can be calculated by finding the amperage and voltage ratings on the appliance and multiplying the two numbers (Amps x Volts = Watts).

Once you have the wattage, multiply it by the number of hours per day the appliance operates, and divide that number by 1000. You have just determined how many kilowatt-hours per day the appliance uses. An approximate monthly usage can be determined by multiplying that number by 30 days. You may then multiply the monthly kWh usage by the appropriate rate you pay to determine how much that appliance costs per month to operate. Later in the book, a worksheet is provided which will allow you to figure an approximate usage for your entire home.

$$\frac{\text{Wattage} \times \text{Hours of Use}}{1,000} = \text{kilowatt-hours}$$

### **The Meter**

Many times the first thing blamed for a high electric bill is the meter. But because of a thorough testing program maintained by Laurens Electric, the meters serving our customers are very accurate.

New meters delivered to us from the factory are guaranteed to be 100% accurate. To protect that consistency, no adjustments are made on new meters. And to ensure the continued accuracy of those meters, Laurens Electric tests many of them each year. Of

those we tested last year, the accuracy rate was over 99.7%.

Meters are read monthly by Laurens Electric employees. Two areas of confusion surrounding meters and meter readings are their multipliers and the number of days in a billing cycle. The multiplier is the number by which the reading must be multiplied to show kilowatt-hour usage. This number may vary, but in most cases the multiplier is 10. The number of days in a billing cycle may also vary between 28 and 34 days. So, when comparing one month's bill to another, be sure to consider the length of the billing period.

## **Vacation**

Just because you are able to get away and take some time off, doesn't necessarily mean your electric appliances are getting time off too. And so bills can't always be expected to be dramatically lower when you've been away on vacation.

While you are away from home, your refrigerator, water heater and heating or cooling system, along with a hand-full of smaller appliances may be running almost as much as usual.

If the refrigerator or freezer is not emptied and turned off, for example, it will continue to maintain the preset temperatures. They may not run quite as much, but they will run just the same. The same is true for your water heater and heating and air conditioning system. Unless they are turned completely off, they are likely to operate periodically and use energy.

Other things around the home that may operate even though you are not at home are clocks, older color televisions with instant-on features, your well-pump if you have one, and attic fans or ventilators.

Deciding which of your appliances will be left on during your vacation is your decision. But it does not have to be an all-or-none situation.

In the end, every home and every family is different, and there are undoubtedly other things you can do in your home to trim the electricity used while you are taking it easy.

## **Energy Hogs**

To say that electricity has revolutionized the way people live is somewhat of an understatement. In fact there is little we do today around the home that does not in some way utilize the tremendous power of electricity. Light bulbs, clocks, small appliances, computers, radios and televisions are all things we use almost everyday of every year.

But what are the big users of electricity? What are the energy hogs around your home? The answer to that question is not very hard to find. One feature of a home that often consumes the most electricity is the heating and air conditioning system.

Another big user in the home is the source of those wonderful hot baths, your water heater. In the kitchen, your refrigerator and freezer, along with self-cleaning ovens, are the biggest consumers of electricity. And, finally, the clothes dryer in the pantry, on average, can account for a sizable portion of your monthly bill.

## **Hidden Users**

Two of the biggest consumers of electricity in some homes are also two of the best hidden energy hogs. They are heaters for water beds and hot tubs.

Studies have shown that there are water beds in about 30% of homes in the United States. And if not handled properly, they could be costing those people a lot of money. Likewise, to heat a large hot tub could double your monthly power bill. Another hidden consumer of energy around your home is the well pump, especially if the system is not operating properly. A variety of problems with the well pump and its storage tank could be causing the pump motor to run almost constantly, wasting those valuable kilowatt-hours.

Beginning with the next section of this book, we will take a look at specific consumers of electricity in the home and ways to cut back on their appetites.

## **Ways to Save on your Home Energy Usage**

### **Heating and Air Conditioning**

As previously stated, it is likely that your heating and air conditioning costs are higher than anything else in the home. That's not always the case, but there is a good chance of it.

There are four factors that affect heating and cooling costs: the outdoor temperature; the thermal efficiency of your home (insulation); the efficiency of your heating and cooling system; and the temperature you want to maintain inside the home (thermostat setting).

There is nothing you can do that more effectively controls the cost of keeping your home comfortable than insulating it properly. That includes sufficient R-values of insulation in the attic, walls and floor, as well as buttoning up air leaks throughout the house. Keep in mind that attic insulation should be at least R-30, wall insulation at least R-12, and floor insulation at least R-19.

Now that things are well-insulated, look for holes in the walls, floor and ceiling, such as cracks around windows, doors, light fixtures, plumbing entrances and other assorted airways. All windows should be either the self-insulating type or should have storm windows installed. Around all windows and doors, close off small gaps with caulking or weather-stripping.

Refer to the following list of possibilities when looking for less conspicuous air leaks:

- Plumbing penetrations through insulated floors or ceilings
- Fireplace dampers
- Attic access hatches
- Recessed lights and fans in insulated ceilings
- Missing plaster
- Electrical outlets and switches, especially on exterior walls
- Window, door and baseboard molding
- Dropped ceilings above bathtubs and cabinets

Any such leaks should be repaired or filled with caulk, expanding foam or some other insulation.

The thermostat is another place to take action. In the winter, adjusting your thermostat to a slightly lower setting can make a difference. Up to 2% of your heating costs could be avoided for every degree you lower your thermostat. Likewise, turning the thermostat a few degrees higher during the summer means savings.

A clock thermostat which can be set to raise and lower the temperature automatically several times a day, can keep the system from running when it's not needed. However, heat pump thermostats should be left at one setting.

Another big factor in heating and cooling costs is the efficiency of the system itself. Without proper maintenance and cleaning, even the most energy-efficient system in the world can become an energy waster.

It is advisable to have your system routinely serviced by a qualified HVAC mechanic once a year, but that doesn't mean there's nothing you can do to help keep the system in proper working order. Start by making sure none of the registers are blocked or restricted. Then, proceed to the unit itself and check its filter. Estimates show that up to 90% of all HVAC systems have dirty filters, and that could be costing you as much as 20% more than normal to keep your home comfortable. All duct work, whether in attic space or underneath the house, should be well insulated. That is a task that the homeowner can generally complete with no more tools than a good knife and a roll of duct tape.

Finally, the age and efficiency of your system can make a big difference. A 10-year-old system, although it may have been top-of-the-line at that time, could be much less efficient than new HVAC systems.

### **Water Heater**

Heating water for a family of four can easily cost \$30 per month. To keep these costs under control maintenance is, again, very important. A common cause of excessive water heating cost is a water leak at the water heater, which could force the water heater to run almost constantly.

As in the HVAC system, the thermostat setting of a water heater is an important factor to consider. Lowering the thermostat to between 130° and 140° can not only save you money, it can also reduce the scalding dangers associated with very high temperatures.

To insulate water heaters there are relatively inexpensive water heater insulation blankets at home improvement stores. Also insulate the water lines leading from the tank for the first 3 feet with pipe wrap or tubular foam insulation.

One last way to save on the cost of heating water is to simply use less of it. Install low-flow shower heads, take shorter showers, and wash clothes in cold water when possible.

## **Well Pumps**

Barring any problems, a water well is a very economical way to supply your home with water.

High electrical usage occurs when the system malfunctions. If there is a water leak somewhere, the pump could be running much more than normal. Another common problem is a water logged pressure tank. Normally, the pump runs, pushing water into the pressure tank against the air charge until a preset pressure is reached, at which time the pressure switch turns the pump off. This way the pump does not have to operate during the whole time you are using water, because you have the tank's pressure to draw from. If the pressure tank has lost its air charge, it is said to be water logged.

Any of these problems can cause a higher than normal bill, not to mention the extra wear and tear on your well pump.

## **Quick Tips for Energy Conservation**

Take a walk through your home with this checklist and it will help you check off wasteful energy use conditions and habits.

- Insulate your walls, ceilings and floors to at least R-12, R-30 and R-19, respectively.
- Install thermopane or storm windows/doors if they are not already on your home.
- Make sure all external doors and windows are weather stripped or caulked to seal off air leaks.
- Insulate heating and air conditioning duct work with at least 2 inches of insulation.
- Provide at least 1 square foot of free exhaust from the attic for every 150 square feet of attic space.
- Install a tight-fitting damper in your fireplace flue.
- Replace or clean the filters in your heating and air conditioning system on a regular basis, and have a qualified HVAC mechanic service the unit at least once a year.
- When buying a new heating or air conditioning system, choose one that is highly efficient and properly sized for your home.
- If you have a heat pump, set the thermostat on a constant setting appropriate for the season and leave it there, avoiding daily adjustments.
- Use the sun's heat in the winter to help warm a room by opening curtains or shades.

- Locate your thermostat on an inside wall, away from drafts, sunlight or other heat sources.
- If using window air conditioning units, install them on the shady side of the house when possible.
- Lower thermostat settings in the winter and raise them in the summer.
- Install a clock thermostat on your HVAC system (if it's not a heat pump) so that settings are automatically adjusted when you are at work or in bed.
- Clean HVAC registers to ensure unrestricted air flow.
- Plant trees and pull down the shades on east and west-facing windows to reduce the amount of heat entering your home through the windows in the summer.
- Use ceiling fans. In the winter, set the fan to blow toward the ceiling to circulate warm air to the rest of the room. In the summer set the fan to blow toward the floor to keep you more comfortable with a cooling breeze.
- Clean the condenser coils on your refrigerator at least once a year to increase the coils' efficiency.
- Install low-flow shower heads and faucet aerators to conserve hot water.
- Install an insulating blanket on your water heater, and place insulation on the first three feet of pipe leading from water heater.
- Set your water heater thermostat to between 130° and 140°.
- If available, use the energy saving settings on refrigerators, dish washers, washing machines and clothes dryers.
- Check the door seals and gaskets on the refrigerator and freezer to ensure they seal tightly.
- Avoid putting hot foods directly inside the refrigerator or freezer. Let them cool to room temperature first if possible.
- Keep the freezer full. A full freezer operates much more efficiently than an empty one and will stay colder longer in the event of a power outage. If the freezer isn't full, fill plastic containers with water and freeze them.
- Decide what you want before you open the refrigerator/freezer door to prevent wasting energy.
- Utilize smaller cooking appliances such as crock pots, microwaves and toaster ovens whenever possible.

- Wash only full loads of dishes in your dish washer.
- Wash clothes in cold water if possible to save heating large amounts of water.
- Don't over-dry clothes. It saves energy and unwanted wear and tear on the clothing.
- Cover spas and hot tubs and insulate around their sides and bottom to prevent heat loss.
- Make sure your well pump is operating properly and not running continuously.
- Use light bulbs best suited to their tasks, avoiding large bulbs where they are not needed.
- Always make up water beds. The blankets provide insulation that prevents energy loss in the bed's heater.