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Energy Savings Guide

Your energy needs are unique

Members are looking for ways to control their energy use.

Inside you'll find information to help you do just that. Review the simple steps you can use to lower your energy bills. Then, if you still have questions about electrical use and costs, call the professionals at your electric cooperative. We're here to help!

Brought to you by



Why is My Electric Bill Higher Than My Neighbor's?

You just answered this question yourself. It's your electric bill, and it reflects the amount of electricity consumed by *you* and *your family in your home* or on *your farm*.

Your neighbor may have a completely different set of circumstances...different number living at home, different lifestyle, different size home with a different style of construction, etc. Your bill may also differ from your neighbor's bill due to the varying numbers and types of major appliances as well as different heating and cooling systems.

Lifestyle Makes a Difference

You have complete control over how you use your electricity by choosing the conveniences that are necessary for you to maintain your standard of living.

The way you live and the way you use your electrical appliances may have a greater impact on your consumption of electricity than the number of appliances you use. Let's examine some of the driving factors that can make your electric bill seem higher than average.

Home Energy Costs

Get a clear picture of which parts of your home use the most energy.

The first step in reducing home energy costs is to review last year's utility bills. Using the national percentage averages below, a homeowner who spent \$2,500 a year for home energy would have paid roughly:

- \$1,400 for heating and cooling
- \$575 for appliances and lighting
- \$400 for water heating
- \$125 for refrigeration

Contact your local Touchstone Energy® cooperative representative to review your bills and receive a more accurate estimate.

Family Size

There is a direct relationship between the number of people living in a home and the amount of energy that is used. That's especially true if you have teenagers at home. In addition, if friends and relatives are visiting, you can expect to use more energy for cooking, baking, laundry and hot water.

Heating and Cooling

Heating and air conditioning uses the largest chunk of your home's energy dollar. Conversely, energy conservation designed to reduce heating or cooling load will have the greatest impact on your monthly energy bills. Heating and cooling expense is driven by seasonal weather extremes. An average home will experience its highest energy bills of the year during the hottest months of the summer and the coldest months of the winter. To reduce your heating and cooling expense follow these simple tips!

- To assure that your heating and cooling system is operating efficiently, have it serviced annually by a certified technician.
- Inside and outside coils should be kept clean and free of debris.
- Return filters should be changed monthly.
- Set thermostat at 78 degrees in the summer and 68 degrees in the winter. For each degree higher or lower you set the thermostat you save an additional 2% to 3% on heating or cooling costs.
- Install and utilize a programmable thermostat and save an additional 10%.
- Have a HVAC technician check carefully for duct leaks. Leaks that are found should be sealed with fiberglass mesh and mastic sealant.
- When purchasing a new system, make sure that it is sized correctly for your home and has the highest efficiency rating (SEER) that your budget can afford.

Water Heating

Hot water plays an important role in everyone's life, but many people require substantial quantities of hot water, and that results in higher energy use. Ask yourself some of the following questions...

- When I take a bath, do I use hot water sparingly, or is the tub completely full?
- Do I take short showers, or do I stay in the shower until the hot water gets cold?
- Do I repair leaky faucets, or simply let them drip and waste hot water?
- Do I operate washers and dishwashers with a full load, or just whenever convenient?
- Are my hot water pipes insulated?

It is important to note that hot water usage is the **second largest energy consumer** in the household behind heating and cooling.

Try this & save...

Install water flow restrictors and aerators in sink faucets. This can save you money by reducing water use. Reduce the water heater temperature to 120°F. This can decrease heat loss from your tank. Dishwashing may require higher temperature settings around 130°F. However, many dishwashers now have a temperature boost that allows you to keep the water heater temperature set lower.



Did you know...?

Tankless water heaters are ideal for applications where space is at a premium or in small vacation homes, and can serve quite effectively in point of use applications. However, their use as the central source of hot water in a residence should be carefully considered.

While tankless water heaters offer some modest energy savings over storage water heaters (possibly as little as \$36/year for electric water heaters), these minimal gains are at the expense of substantially higher initial purchase costs, higher installation costs (upgraded power requirements), higher maintenance costs, and possible lifestyle changes to accommodate the limited flow rate output of tankless water heaters. For example: taking a shower while washing clothes could require as much as 6 gallons per minute of hot water. It's unlikely that any electric tankless water heater could supply the heating capacity to meet this demand.

Phantom Loads

We have a host of time and labor saving appliances available to help us do our work whenever we need their service. Some of these appliances use electricity only when you turn them on.

But consider this...many appliances are quietly using energy around the clock, even though you think they are turned off! The power supplies to your instant-on TVs, computers and their peripherals, cordless phones, cell phone chargers, clocks on microwaves and electric ranges, etc., are examples of "phantom loads" that steadily consume electricity whether you are using the device or not.

In addition, any appliance that has a cube-shaped transformer (sometimes called AC adaptors) on the end of its cord is also creating a phantom load. That's why these transformers feel warm even though the device is off. Another type of phantom load is the oil heater in an air-source heat pump. Even though heat pumps are an energy efficient means for heating and cooling your home, there is a steady subtle draw of electricity to heat the oil fluid in the sump of the heat pump. Phantom loads add up to a huge waste of electricity in the U.S. that costs consumers billions of dollars per year and many billions of kilowatt-hours. The total phantom load in your home could account for substantial energy use.

Did you know...?

The new big screen TVs and plasma TVs are great for watching your favorite movies or sports network. But they can use as much as 850 kilowatt-hours per year.



Try this & save...

One way you can eliminate phantom loads is by plugging them into a plug strip that is equipped with its own power switch. Simply switch the power strip on and off as you use the appliance. For appliances that have remote controls, this method will disable the unit's remote control until you turn the power strip on.

Appliance Use

The wise use of appliances can have a positive effect on your energy consumption.

Ask yourself these questions:

- Do I turn off lights and ceiling fans when a room is not in use, or do I leave them on?
- Does the television set entertain the entire family, or does it entertain an empty room?
- Do I leave my computer and peripherals on for extended periods of time when not in use?

These are prime considerations that affect the amount of electricity you use to maintain your lifestyle.

Make a Plan

Vacation Use

When vacation time comes and you're planning to be gone for a couple of weeks, your electric bill should decrease significantly, right? Wrong!

Many people believe that when they leave for vacation, their electric meter stops until they return. Ask yourself a few questions before assuming your electric bill should decrease by any considerable amount during vacation.

First, was your heating or cooling system turned off or the thermostat set up or down in your absence? If these preparations are not made before you leave, your heating and cooling system will work to maintain your thermostat's preset temperature even if no one is at home.

Second, was the water heater turned down or off while you were gone? If the electric water heater is left energized during vacation, it will continue to operate and maintain the tank temperature even if you're not using any hot water. Were the refrigerator and freezers emptied and turned off? If not, they will continue to operate to maintain the preset temperatures.

Perhaps you can make arrangements with a neighbor to keep an eye on your place and adjust the heat and/or air conditioner and water heater shortly before you return. In addition, you may wish to unplug all appliances not in use. If a light is to be left on, it should be connected to a timer.

Also, many vacationers bring home several days or weeks of laundry. This will give your electric water heater and washer and dryer a workout your first day or two back home.

Try this & save...

Seal exterior cracks and holes like the ones found around plumbing and electrical penetrations to the outside and ensure tight-fitting windows. Small cracks or holes in the building exterior (walls, windows, doors, ceiling and floors) can really add up to substantial heating or cooling losses. Install weather stripping and caulking to stop air leaks.



Seasonal Use

In addition to vacations, take a look at some of the seasonal uses for electricity that may cause an increase in consumption. These include crop dryers, air conditioners, portable heaters in the garage or basement, engine heaters that keep your vehicles ready to run, holiday lighting, heat tape to keep pipes from freezing.... the list goes on and on.

Also, don't forget about hobbies or businesses that operate out of the home.

Record

You can do something about how you and your family use energy. A big, first step is tracking current energy consumption.

Meter Reading Dates

A factor that enters into higher than normal electric bills is the number of days between meter readings. Check the number of days in your billing cycle and the average number of kilowatt-hours used per day to make accurate comparisons. Many people often overlook this important consideration.

It's important to read your meter on the same day of each month. If you notice that your usage has increased substantially from one month to the next for no apparent reason, you will be able to diagnose equipment failure sooner.

Is the Meter Accurate?

The electric meter is often accused of inaccuracy, but it's seldom the culprit. Your meter does not lie. When it records more electricity being used, try to find out why by looking at your family's activities during that period...was the weather warmer or colder than normal? Was it a washday? See what activities, if any, can be altered to use energy more wisely.

The meter is a finely calibrated, highly accurate device used to measure power use. Your electric cooperative has a continuing program to test the accuracy of all its meters to assure that you are being billed for the exact number of kilowatt-hours used. All meters are tested on a regular basis. Historical data bears out the fact that in more than

99% of the cases, the electric meter is accurate. High bills are almost always traced to other causes.

Check

Other Sources of High Usage

Sometimes you'll find equipment using electricity that you thought was turned off. It could be a faulty motor control on an air conditioner, well pump or pool pump, a leaky hot water faucet, or lights and equipment simply left on. By comparing your use with that in the Appliance Energy Use Guide on pages 6 and 7, you may determine whether that equipment is using an unusually high amount of electricity.

However, if you can't find the problem, contact your electrician or seek proper advice from your electric cooperative.

Act

Keep Records

Keep records for a few months each season. Learn how changes in your activities can affect your energy budget.

Use Less Energy

Make changes to how you use your energy. Make easy changes first. Here are some ideas to get you started.

- Set thermostats for energy economy. Make changes in temperature levels gradually so you and your family can adjust. It is estimated that 1°F temperature change can reduce heating and cooling costs by 2-3%. By installing a programmable thermostat, changes such as these require minimal effort.
- Keep heating and cooling systems working more efficiently by replacing filters monthly and having your system serviced annually.
- Turn off lights whenever possible.
- Use energy efficient lighting such as T-8 fluorescent lighting, compact fluorescent lighting and high pressure sodium lighting to cut lighting costs by up to 75%.
- Lower the temperature setting on your water heater to 120°F.
- Fix hot water faucet leaks.
- Reduce phantom loads.

Other Things to Consider

- **Swimming Pool**—The filter pump runs continuously in most cases during the summer months. The horsepower rating on the motor usually ranges from .5-1.5 and can use 360 to over 1,000 kilowatt-hours per month. Utilize a timer to reduce the pumps operational time.
- **Ceiling Fans**—Ceiling fans and portable fans can help make you feel cooler, but they don't cool the room. Use them wisely; when you are not in the room, turn them off. Conversely, most ceiling fans have a reversing switch. This can be very effective in moving warm air from the ceiling in the winter and redistributing it throughout the room.

Did you know...?

Water pumps are occasionally the cause of unexpected high energy use. Common failures that cause a pump to gobble energy include water leaks, defective pressure tanks and defective pressure switches. Water leaks and defective pressure tanks can cause your pump to start and stop more often than necessary. Defective pressure switches may cause the pump to run continually. If water for pumping continues to be available to a pump experiencing these problems, it can run for a long time before failing. When pumps are in the well (submersible) or located away from the home, the owner may be unaware there is a problem. Check your pump's run time. A water pump should run for a short time (normally less than 30 seconds) to reach its pre-selected pressure, shut off, and not run again until enough water is used to reduce pressure.

■ **Weather**—Many of the appliances/equipment we use in our lifestyles are directly tied to the weather. As the seasons change – causing the temperature to turn cooler or warmer—it usually has a direct effect on our air conditioning and heating use.

■ **Hot Tubs**—Although there is nothing more soothing than sinking into a hot tub after a long day, these energy wasters are nothing more than a huge water heater with an open face. Many times, owners don't even take the time to cover them up when not in use. Hot tubs can use \$25 to \$50 of energy per month or more.

■ **Closing Off Vents**—Perhaps you have unused rooms where you shut off the vent damper thinking you will save electricity by not heating or cooling that room. What you have really done is created an “unbalanced pressure” situation which will result in less efficient operation due to short cycling of the furnace or heat pump and blower. In the case of a gas furnace, this situation could introduce carbon monoxide into the home through back drafts. Rather than closing off vents, consider adjusting the thermostat temperature up in summer and down in winter.

■ **Space Heaters**—Most space heaters are 1500-watt units that are used to “warm up” a room such as a bathroom or used temporarily while you work in an unheated garage. A typical space heater used just two hours per day can account for 90 kilowatt-hours of electricity in a month's time.

■ Replacing Major Appliances

Age—Sometimes it is hard to justify replacing a major appliance for efficiency reasons until the unit dies. When replacing major appliances, look for the Energy Star label (www.eere.energy.gov).



Location—If you do replace an older major appliance that is still working, please think twice before putting that older unit somewhere else like in the garage or basement. Freezers and refrigerators are designed to be placed in 70°F-conditioned areas. Putting them outside in a garage that gets uncomfortably hot in the summer time just causes the refrigerator or freezer to run more often. In addition, these places aren't always the cleanest, so the coils collect dust, pet hair, etc., quicker than in the house, which affects their efficiency.

■ **Air Leaks**—It's been estimated that a typical home with all of its foundation and wall cracks, holes around sink plumbing and electrical outlets, gas and fireplace flues, and use of recessed can lighting in ceilings have air leakage that it is equivalent to leaving a door open year-round. Take the time to seal all of these openings with caulk or foam and apply insulated foam gaskets behind outside wall switches and receptacles. Add sufficient insulation where needed in attics and walls.

■ **Using Energy-Efficient Heating and Cooling Systems**—If you have heating and cooling units that are more than 15 years old, consider replacing them with energy-efficient units. Great strides have been made in improving the energy efficiency of heating and cooling equipment. If you use evaporative cooling systems (swamp coolers), follow the manufacturer's recommendations regarding maintenance items such as pads, water changes, etc. Do not operate them simultaneously with refrigerated air conditioning systems and remember to close windows and doors when switching to refrigerated-type systems. Also cover the evaporative coolers when not in use to eliminate air leaks through them. Talk with your electric cooperative about what is available.

■ **Shut the door**—Every time the entry doors are opened during heating and cooling seasons, unconditioned air from the outside enters the home, which has to be heated or cooled. Try to reduce these door openings to a minimum.



Try this & save...

To reduce your lighting costs use compact fluorescents wherever possible as they are the most efficient lighting on the market. They use 70% less energy, produce only about 10% of the heat, and last 10 times longer than incandescent bulbs. Install motion sensor light switches. They automatically shut off lights when not in use.

Appliance Energy Use Guide

To calculate cost per month, take the suggested KWh/Mo usage times your KWh cost. See step 1 on page 7 to calculate KWh cost.

KITCHEN	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Coffee Maker	900	50	45	_____
Dishwasher (including water heating cost)	1200	30	36	_____
Electric Skillet	1200	13	15.6	_____
Hot Plate	660	6	4	_____
Microwave	1450	15	21.8	_____
Range	12500	8	100	_____
Range-Cleaning Cycle	4500	3	13.5	_____
Roaster	1330	13	17.3	_____
Slow Cooker	200	24	4.8	_____
Toaster	1150	3	3.5	_____
Waste Disposer	450	3	1.4	_____

FOOD STORAGE	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Refrigerator *				
Manual Defrost			70-150	_____
Frost-Free			75-175	_____
Side-by-Side			120-250	_____
Freezer*				
Manual Defrost			70-150	_____
Frost-Free			85-175	_____

*Wattage and hours of run time for refrigerators and freezers vary widely due to age, location, frequency of maintenance, and their energy efficiency rating. A refrigerator or freezer located in a garage can use up to three times more energy.

HOME ENTERTAINMENT	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Televisions (8 hours per day)				
Plasma	328	240	79	_____
Rear-projection	208	240	50	_____
LCD	193	240	46	_____
CRT (Conventional Picture Tube TV)	146	240	35	_____
Personal Computer (6 hrs/day)	250	180	45	_____

GENERAL HOUSEHOLD	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Water Heater (personal use only)				
3 people-1350 gal per month	4500		374	_____
* Add 90 KW for each additional person				
Clothes Dryer (5 loads per week)	5000	20	100	_____
Clothes Washer (5 loads per week)				
Cold/Cold setting	500	20	10	_____
Warm/Warm setting	5000	20	70	_____
Vacuum Cleaner	630	6	3.8	_____

HEATING & COOLING	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Air Conditioner (central ac type, 8 hours/day)				
2 Tons (13 SEER)	1,850	240	444	_____
3 Tons (13 SEER)	2,770	240	665	_____
4 Tons (13 SEER)	3,690	240	886	_____
Air Conditioner (window type, 8 hours/day)				
6,000 btu/hr	800	240	192	_____
10,000 btu/hr	1,350	240	324	_____
12,000 btu/hr	1,600	240	384	_____
Portable Space Heater (8 hours/day)	1,500	240	360	_____
Air Cleaner (Ionizer)	70	720	50	_____
Fans: Attic			24	_____
Ceiling Fan (with lights)	180	720	50	_____
Ceiling (without lights)	60	360	43	_____
Window (20")			18	_____

PERSONAL COMFORT	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Water bed heater	400	300	120	_____
Electric Blanket	10	240	24	_____
LIGHTING	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
60-watt Incandescent Bulb	60	120	7.2	_____
Compact Fluorescent 13-watt Bulb (60 watt equiv.)	13	120	1.6	_____
100-watt Incandescent Bulb	100	120	12	_____
Compact Fluorescent 27-watt Bulb (100 watt equiv.)	27	120	2.8	_____
Two 4-Foot 40-watt Fluorescent Tubes	80	120	9.6	_____
FARM AND MISCELLANEOUS	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Water Pump				
1/3 hp	333	60	20	_____
1.5 hp	1500	60	90	_____
Garage Door Opener	800	12	9.6	_____
Engine Block Heater (8 hrs/day)				
500-watt	500	240	120	_____
800-watt	1000	240	240	_____
1500-watt	1500	240	360	_____
2500-watt (diesel engine)	2500	240	600	_____
PHANTOM LOADS	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Instant on TV	28	720	20	_____
VCR	14	720	10	_____
Microwave Oven with Clock	8	720	6	_____
Wall Cube Power Supply (AC Adaptor)	5	720	4	_____
Stereo with Remote Control	8	720	6	_____
Stove - Electric	14	720	10	_____

How to Estimate Energy Use & Cost

The wattage of appliances (equipment) and the amount of operating time can vary greatly. The following information will show how to determine where the energy dollars are going in your home.

STEP 1

Look on your utility bill and find the cost per kWh that is charged in your area. If you cannot locate a bill, rate information can be found by logging onto your cooperatives Web site or by giving them a call.

STEP 2

Since the wattage of an appliance (equipment) determines the electrical usage per hour, the second step is to determine the wattage.

The wattage of an appliance is found on the serial plate. But it is possible that the electrical requirements will be expressed in volts and amperes, rather than watts. If so, multiply **volts** times **amperes** to obtain the **wattage**; e.g. 120 volts x 12.1 amperes = 1,452 watts.

EXAMPLE OF SERIAL PLATE

MICROWAVE OVEN			
AMPS	12.1	VOLTS	120
HERTZ	60	WATTS	1452
FORM NO.	000000	MODEL NO.	00000
CODE	0	SERIAL NO.	0000

STEP 3

Use the formula shown below to estimate usage and cost.

$$\text{Watts (Divided By) 1000} = \text{KW}$$

$$\text{KW} \times \text{Rate \$ per KWh} = \text{Operational Cost per Hour}$$

$$\text{Operational Cost per Hour} \times \text{\# hours operated per day} \times \text{\# days in the month} = \$$$

To determine yearly cost:

$$\text{Operational Cost per Hour} \times \text{\# hours operated per day} \times \text{365 days in a year} = \$$$

Electric Cooperatives abide by these Seven Cooperative Principles

Voluntary and Open Membership

Cooperatives are voluntary organizations, open to all persons able to use their services and willing to accept the responsibilities of membership.

Democratic Member Control

Cooperatives are democratic organizations controlled by their members, who actively participate in setting policies and making decisions.

Members' Economic Participation

Members contribute equitably to, and democratically control, the capital of their cooperative.

Autonomy and Independence

Cooperatives are autonomous, self-help organizations controlled by their members.

Education, Training, and Information

Cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives.

Cooperation Among Cooperatives

Cooperatives serve their members most effectively and strengthen the cooperative movement by working together.

Concern for Community

While focusing on member needs, cooperatives work for the sustainable development of their communities.



Touchstone Energy®
Cooperatives
of Arizona & California

More Web sites and helpful resources

www.touchstoneenergy.com - for information and to locate your local Touchstone Energy cooperative.

www.energy.gov/yourhome.htm - U.S. Department of Energy

www.energystar.gov - Energy Star Web site

www.ase.org - Alliance to Save Energy

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