



# Your Family is Unique



## Your unique energy needs

Members are looking for ways to control their energy use. The best way to do this is by being aware of how much energy you use each month and how it is being used in your home and on your farm. This involves reading your meter to keep track of monthly energy use. By comparing your monthly usage, you may be able to identify changes in your patterns of use.

Take a few moments now to work through this guide. Then, if you still have questions about electrical use and costs, call the professionals at your electric cooperative. We're here to help!

## Lifestyle Makes a Difference

You have complete control over how you use your electricity by choosing the ingredients 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 look at some of these "lifestyle considerations" that can make your electric bill seem higher than average.

## Family Size

There is a direct relationship between the number of people living at 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

From a comfort standpoint, most of us prefer to be relatively cool in summer and warm in winter. Others prefer temperature extremes. Humidity plays an important part in our year-round comfort, too. If we operate dehumidifiers in summer (and to a lesser degree, humidifiers in winter), this contributes to our household energy consumption because they tend to run continuously. Portable space heaters, air conditioners, and fans located in such places as the garage and basement also contribute to your energy consumption.

By taking a look at our "comfort" lifestyles in terms of maintaining relative humidity and temperature, we can use energy wisely in many ways. These range from adding insulation, weather-stripping, caulking and changing/cleaning filters monthly to turning down the thermostat in winter and up in summer.

## Water Heating

Hot water plays an important role in everyone's lifestyle, 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 **2<sup>nd</sup> largest energy consumer** in the household behind heating and cooling.

## Did you know...?

***Tankless water heaters have advantages. They are compact, easy to drain, and do not have to heat stored water. Consequently, they may be ideal for applications where space is 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.***

## Try this & save...

Install water flow restrictors and aerators in sink faucets. This can save you money by reducing water use.

Reduce the hot 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.



## 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 TV's, 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.

## 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.

## 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.

## Did you know...?

**The new big screen TVs and plasma TVs are great for watching your favorite movies or sports network. But they use as much electricity as an older style refrigerator—about 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.



## Make a Plan

### Vacation & Seasonal 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 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.

Take a look at other electrical appliances that keep running while you are on vacation—clocks, fans and power ventilators, heating and air conditioning equipment, lights, personal computers, fax machines and other phantom load appliances.

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 dirty laundry. This will give your electric water heater and washer and dryer a workout your first day or two back home.

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 car, truck or tractor 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.

## Try this & save...

Seal exterior cracks and holes 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.



electricity that you thought was turned off. It could be a stock tank heater, leaky hot water faucet, or lights and equipment simply left on. By comparing your use with that in the Appliance Energy Use Guide, 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.

## 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 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 use has increased substantially from one month to the next for no apparent reason, you will be able to diagnose equipment failure sooner. You may need to call an electrician to check wiring and appliances for grounds, shorts, or other malfunctions.

### 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 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

### Common Sources of High Usage

Common sources of high electricity usage include electrical faults in wiring systems that are usually due to physical damage, moisture and dirt or improper connections. Sometimes you'll find equipment using

## 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 system pressure to the pre-selected "cut in" pressure.**

## 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

Change. 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%.
- Keep heating and cooling systems working more efficiently by replacing filters monthly and cleaning coils annually.
- Turn off lights whenever possible.
- Keep fixtures clean.
- Use energy efficient lighting such as T-8 fluorescent lighting, compact fluorescent lighting and high pressure sodium lighting.
- 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.

■ **Ceiling Fans**—perhaps you've been told to run your ceiling fans to assist your air conditioner. Many homes have ceiling fans in each bedroom, the family room, living room and kitchen. If you add them all up, they can accumulate a lot of electrical usage especially if they are allowed to run 24 hours per day. You would be better off to leave the fan for the air handler on continuously than to leave all the ceiling fans on. Ceiling fans can help improve upon heating and cooling requirements, but use them only when needed. Long run times in unoccupied rooms can change your ceiling fan from an energy saving device to an energy gobbling phantom load.

■ **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 affect on our electric 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.

■ **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 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.

■ **Dehumidification**—In the summer, one may find a dehumidifier in use to reduce the humidity levels within a home. These units use more electricity than one might think, especially if on 24 hours per day. Normally, a well-designed air conditioning system will reduce humidity levels to a comfortable level while cooling the home.

Try to limit the number of plants/flowers within the home as they contribute to moisture levels. Make sure bathrooms are equipped with exhaust fans controlled by a humidistat to take the moisture from showers to the outside.

■ **Power Septic Systems**—these units are designed to run continuously which increases electrical usage. These units can easily consume 275 to 300 KWh per month.

■ **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 2 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. See [www.eere.energy.gov](http://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. By 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 enough 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. 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...



Reduce your lighting expenses. Turn off lights when not in use and use compact fluorescent lighting whenever possible. They are the most efficient lighting on the market, using 70% less energy and lasting up to 10 times longer than incandescent bulbs. Different wattage sizes are available to fit your lighting needs.

# Appliance Energy Use Guide

To calculate cost per month, take the suggested KWh/Mo usage times your KWh cost. See step 1 on page 8 to calculate KWh cost.

KITCHEN	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
BBQ Grill	1350	6	8.1	_____
Bread Maker	210	8	1.68	_____
Broiler	390	3	1.2	_____
Coffee Maker	900	50	45	_____
Deep Fat Frier	1450	5	7.3	_____
Dishwasher (incl 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	7	3.2	_____

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, & their energy efficiency rating)

HOME ENTERTAINMENT	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Radio	70	100	7	_____
Stereo	150	70	10.5	_____
Television (8 hours per day)				
19" Solid State	200	240	48	_____
25" Solid State	250	240	60	_____
27" w/picture tube	200	240	48	_____
42" Plasma Integrated HDTV	450	240	108	_____
60" HDTV Monitor Plasma Disp	650	240	156	_____
DVD, Game Boys, VCR	100	60	6	_____
Personal Computer (6 hrs/day)	125	180	22.5	_____
Color Monitor (6 hrs/day)	75	180	13.5	_____
Dot Matrix Printer (6 hrs/day)	50	180	9	_____
Laser Printer (6 hrs/day)	400	180	72	_____
Aquarium-20 gal	70	720	50	_____

GENERAL HOUSEHOLD	Avg Watts	Hours/Mo	KWh/Mo	Cost/Mo
Water Heater (personal use only)				
1 person-685 gal per month	4500		252	_____
2 people-900 gal per month	4500		297	_____
3 people-1350 gal per month	4500		374	_____
4 people-1800 gal per month	4500		450	_____
5 people-2250 gal per month	4500		548	_____
6 people-2700 gal per month	4500		650	_____
Clothes Dryer (5 loads per week)	5000	20	100	_____
Clothes Washer (5 loads per week)				
Including water heater cost				
Hot/Warm setting	5000	20	100	_____
Warm/Warm setting	5000	20	70	_____
Warm/Cold setting	5000	20	40	_____
Cold/Cold setting	500	20	10	_____

<b>GENERAL HOUSEHOLD (Continued)</b>	<b>Avg Watts</b>	<b>Hours/Mo</b>	<b>KWh/Mo</b>	<b>Cost/Mo</b>
Vacuum Cleaner	630	6	3.8	_____
<b>HEATING &amp; COOLING</b>				
	<b>Avg Watts</b>	<b>Hours/Mo</b>	<b>KWh/Mo</b>	<b>Cost/Mo</b>
Electric Heating (8 hours/day)				
Portable Space Heater	1500	240	360	_____
Air Conditioner (window type, 8 hours/day)				
6,000 btu/hr	800	240	192	_____
10,000 btu/hr	1350	240	324	_____
12,000 btu/hr	1600	240	384	_____
Air Cleaner (Ionizer)	70	720	50	_____
Humidifier	120	120	14.4	_____
Dehumidifier	600	360	216	_____
Fans: Attic			24	_____
Ceiling (with lights)	180	360	130	_____
Ceiling (without lights)	60	360	43	_____
Window (20")			18	_____
Water bed heater	400	300	120	_____
Electric Blanket	10	240	24	_____
<b>HEALTH &amp; BEAUTY</b>				
	<b>Avg Watts</b>	<b>Hours/Mo</b>	<b>KWh/Mo</b>	<b>Cost/Mo</b>
Blow Dryer	1500	2.5	3.8	_____
Hair Curler	400	7.5	3	_____
Heat Pad	65	30	2	_____
Shaver	15	2.5	0.04	_____
Sun Lamp	280	15	4	_____
Hot Tub	(varies widely)		250-400	_____
Tanning Bed	2600	8.5	22	_____
<b>LIGHTING</b>				
	<b>Avg Watts</b>	<b>Hours/Mo</b>	<b>KWh/Mo</b>	<b>Cost/Mo</b>
60-watt Bulb	60	120	7.2	_____
100-watt Bulb	100	120	12	_____
Two 8-Foot 65-watt Fluor.Tubes	130	120	15.6	_____
Two 4-Foot 35-watt Fluor.Tubes	70	120	8.4	_____
70-watt Sodium	70	300	21	_____
175-watt Mercury Vapor	175	300	52.5	_____
250-watt Heat Lamp	250	720	180	_____
<b>FARM AND MISCELLANEOUS</b>				
	<b>Avg Watts</b>	<b>Hours/Mo</b>	<b>KWh/Mo</b>	<b>Cost/Mo</b>
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	_____
6' Heat Tape (8 watts/ft)	48	720	34.6	_____
Aerated septic system	384	720	276	_____
Tank Heater	varies on location and number of livestock		40-300	_____
Electric Fence	(varies)		0 to 7	_____
Grain Dryer (no heater) (varies with weather & moisture removed)			1/bushel	_____
(with electric heat)			2/bushel	_____
Motors (1/3 to 10-hp)	1000/horsepower		varies	_____
<b>PHANTOM LOADS</b>				
	<b>Avg Watts</b>	<b>Hours/Mo</b>	<b>KWh/Mo</b>	<b>Cost/Mo</b>
Cordless Drills	240	720	165	_____
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 with Electronic Ignition	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 you how to determine where the energy dollars are going in your home.

## STEP 1

Since the cost of electricity is determined by the number of kilowatt-hours (KWh) used during a billing period, the first step is to determine your average cost per kilowatt-hour.

$$\text{Avg. KWh Cost} = \frac{\$ \text{ amount of electric bill}}{\text{KWh used}} \quad \text{EXAMPLE: } \frac{\$144.20}{1400 \text{ KWh}} = \$ .103 \text{ per KWh}$$

## 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	<input type="text" value="12.1"/>	VOLTS	<input type="text" value="120"/>
HERTZ	<input type="text" value="60"/>	WATTS	<input type="text" value="1452"/>
FORM NO.	<input type="text" value="000000"/>	MODEL NO.	<input type="text" value="00000"/>
CODE	<input type="text" value="0"/>	SERIAL NO.	<input type="text" value="0000"/>

## STEP 3

Use the formula shown in the following examples to estimate usage and cost.

A light uses 100 watts and is left on 15 hours. How many KWhs are used and what does it cost you?

$$100 \text{ watts} \times 15 \text{ hrs.} \times \frac{1 \text{ KW}}{1,000 \text{ watts}} = 1.5 \text{ KWh used.}$$

$$\text{Your cost} = 1.5 \text{ KWh} \times \$ .103/\text{KWh} = \$ .1545 \text{ or } 15\frac{1}{2} \text{ cents}$$

A microwave oven uses 1,450 watts and you use it for 30 minutes. How many KWhs are used and what does it cost you?

$$1,450 \text{ watts} \times .50 \text{ hrs.} \times \frac{1 \text{ KW}}{1,000 \text{ watts}} = .725 \text{ KWh or } .73 \text{ KWh used.}$$

$$\text{Your cost} = .73 \text{ KWh} \times \$ .103/\text{KWh} = \$ .075 \text{ or } 7\frac{1}{2} \text{ cents}$$

## STEP 4

To find your daily cost for electricity, divide your bill by the number of days in your billing period.

$$\text{EXAMPLE: } \frac{\$144.40}{30 \text{ days}} = \$4.81 \text{ which is your daily cost.}$$

To find the daily cost per person in your family, divide the daily cost by the number in your family.

$$\text{EXAMPLE: } \frac{\$4.81}{4} = \$1.20 \text{ per person per day.}$$