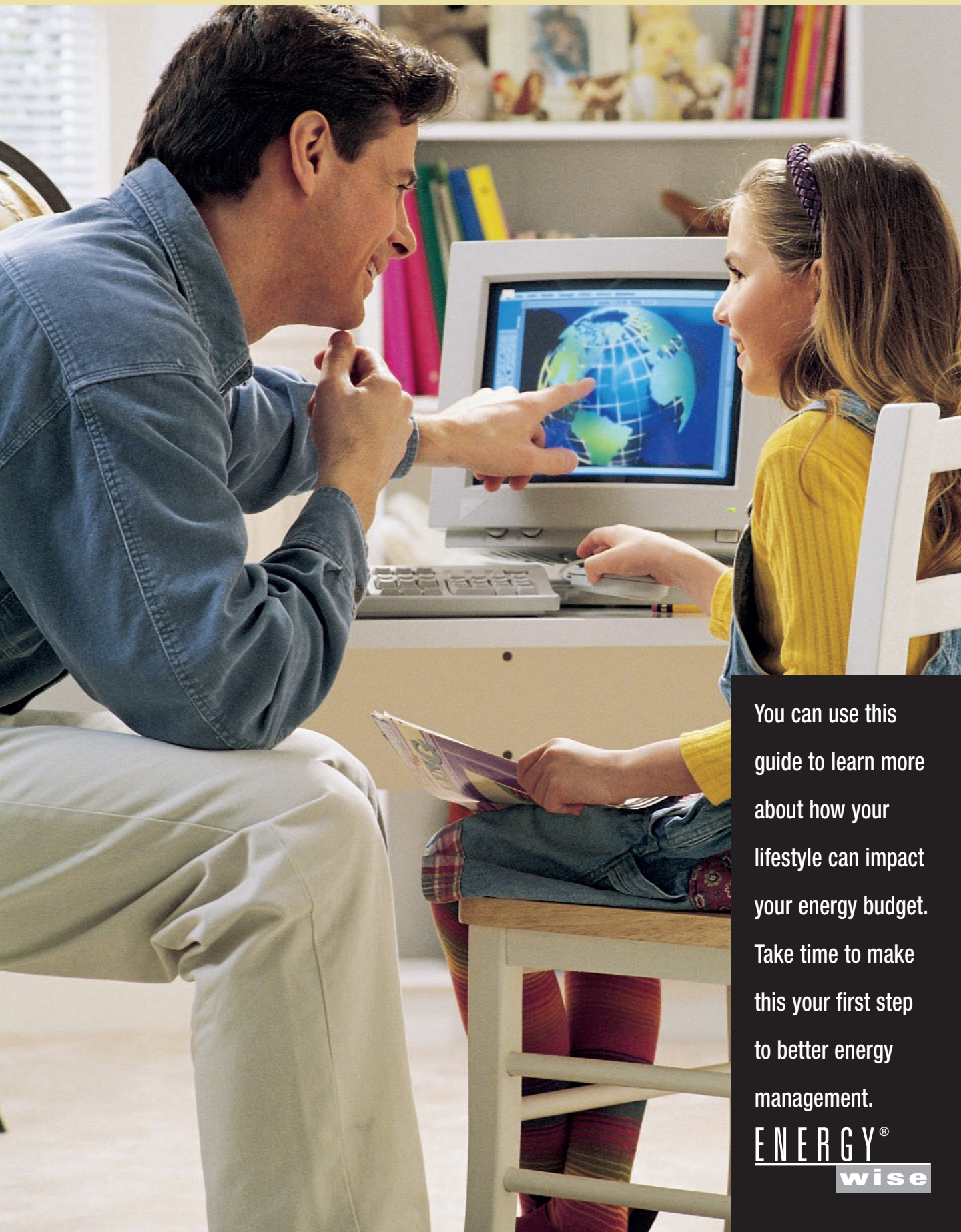


Energy Guide



You can use this guide to learn more about how your lifestyle can impact your energy budget. Take time to make this your first step to better energy management.

ENERGY[®]
wise

Introduction	page 1
What determines your electric usage	page 2
How to estimate energy and cost	page 3
Appliance usage	page 4
Meter monitor chart	page 6
Tips to save energy and money	page 7
We're here to help	page 8

determining your electric usage

We all know the wonderful things electricity makes possible. There's TV, radio, video games, computers. Not to mention that electricity keeps us warm in winter, cool in summer, cooks our food, heats our water, cleans our clothes and keeps our homes and schools bright. Electricity is always ready to make our lives a little easier.

But because electricity and its millions of uses are such a prevalent part of our lives, it is sometimes hard to gauge exactly how much of it we use as we work and play.

Your family is unique

A direct relationship exists between the number of people living in a home and the amount of energy used. In addition, if friends and relatives are visiting, you can expect to use more energy for cooking, baking, laundry and hot water.

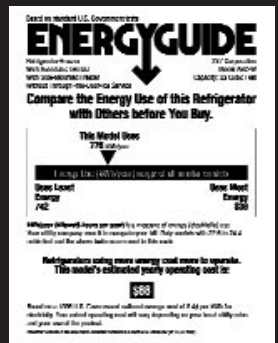
Heating and cooling your home accounts for 44 percent of your energy use. However, several factors can affect how much electricity you need to heat or cool your home, including insulation, trees to shade your home and the use of space heaters or ceiling fans.

Calculating your electric usage

This guide will give you the information needed to calculate your electricity use. It will also show you ways to be Energy Wise[®] by providing tips to make your home even more energy efficient. Plus, you can contact your local electric cooperative to find out more about special rebates for ENERGY STAR[®] air conditioners, heat pumps and other energy-efficient appliances that will save you money when you purchase them and on your monthly electric bill. ENERGY STAR air conditioners and heat pumps reduce energy bills by saving energy.

Your co-op can also provide more information about special off-peak programs. Some electric applications receive a special lower electric rate or credit by being put on an off-peak program. Power to the off-peak application will be temporarily interrupted during times of peak electrical use — usually on just the hottest or coldest days of the year when demand on the electric system reaches peak levels. Examples of applications that qualify for an off-peak program are: electric water heaters, electric heat (when used in conjunction with backup heat that uses another source of fuel), supplemental electric heat, heat pumps, hot tubs and swimming pool pumps. Central air conditioners also qualify. The air conditioner compressor (not the fan) is cycled during peak demand periods.

Buying energy-efficient appliances



If you live in a typical U.S. home, appliances are responsible for more than one-third of your energy bill. Electric appliances like refrigerators, freezers, clothes washers, dryers, dishwashers, ranges and ovens are the primary energy-using appliances. Taking steps to save energy while using these appliances and replacing old, inefficient appliances with modern ones can save you money.

In the U.S., all refrigerators, freezers, clothes washers and dishwashers are sold with yellow EnergyGuide labels to indicate their energy efficiency. These labels provide an estimated annual operating cost for the appliance and also indicate the cost of operating models with the highest and lowest annual operating cost. By comparing a model's annual operating cost with the operating cost of the most efficient model, you can compare their efficiencies.



The ENERGY STAR label also helps identify energy efficient appliances. Promoted by the Department of Energy and the U.S. Environmental Protection Agency, the ENERGY STAR is only awarded to appliances and lighting products that significantly exceed the minimum national efficiency standards.

What determines your electric usage?

Any number of factors can affect your electric use each month. Was it colder or hotter than normal? Did you finally buy that new stereo system you've been saving up for?

This chart estimates what most people buy with their energy dollar, although your use may vary depending on how many people live in your home and whether you have visitors.

Space heating and cooling

It should come as no surprise that heating and cooling your home account for nearly half of your energy usage. However, several factors can affect how much energy you need to comfortably heat or cool your home, including:

- Whether your house is well-insulated with the proper levels of weatherstripping, caulking or storm windows.
- Whether you have trees to shade your house in the summer.
- Whether you use space heaters in the winter.
- Whether you use ceiling fans in the summer.

Water heating

About 15 percent of the energy used in the average American home is for water heating. How much and how often you use hot water affects how much electricity you need.

To use hot water most efficiently, try some of these ideas:

- Take showers rather than filling up a spacious tub for a bath.
- Repair leaky faucets immediately so they don't drip and waste hot water.
- Operate automatic washers and dishwashers only when there is a full load.

Appliance use

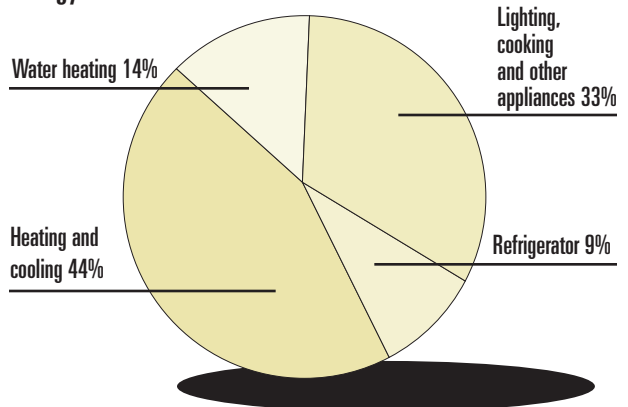
A host of time- and labor-saving appliances help us do our work whenever we need their service.

The number of electric appliances you have, as well as how often you use them, will affect your bill.

For example, do you:

- Leave the lights, television, radio or other appliances on when not in use?

Energy use



Source: Dept. of Energy

- Have kids who open the refrigerator to see what there is to eat every time they walk by?
- Leave the oven on "warm" for an extended period of time?
- Own more than one refrigerator or freezer?
- Leave the outdoor light on during the day?

Using your meter

Your meter is a highly accurate tool. If used properly, it gives you the most precise picture of your electric use. Historical data shows that the meter is an accurate measuring tool more than 99 percent of the time.

The most important thing to remember in reading your meter is to read it on the same day of each month. Billing cycles may fluctuate between 20 and 40 days. If you check your meter every 30 days, you'll be able to monitor your use more accurately. In addition, checking your meter on a regular cycle can alert you to possible equipment failure sooner.

We're here to help

As you can see, electricity touches nearly every part of our lives. The good news is that you can control your electric use.

Even better, your local electric cooperative is willing and ready to do whatever it takes to help make your home, farm or business as energy efficient as possible.

Cycled air conditioning, for example, is one of the best cost-saving options available for cooling your home. Ask the energy experts at your local cooperative what else they can do to help you get the most from your energy dollar.

How to estimate energy and cost

Appliance and equipment wattage and operating time can vary greatly. The following information will show you how to determine where your energy dollars are being spent.

Step 1

Your electric bill amount 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.
Average kWh cost = \$ amount of electric bill divided by kWh used

Example: $\frac{\$100}{1,200 \text{ kWh}} = \$.0834 \text{ per kWh}^*$

**\$.0834 per kWh was the average electricity cost in the U.S. for 2002. Refer to your electric bill for the actual electric rates.*

Step 2

Since the wattage of an appliance (equipment) determines the electrical use 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 use will be expressed in volts and amperes, rather than watts. If so, multiply volts times amperes to determine the wattage.

Example:
120 volts x 12.1 amps = 1,452 watts

Microwave oven			
Amps	12.1	Volts	120
Hertz	60	Watts	1452
Form no.	00000	Model no.	00000
Code	0	Serial no.	00000

Step 3

Use the formula shown in the following example to estimate use and cost. A light uses 100 watts and is left on 15 hours. How many kWh are used and what does it cost you?

$\text{KWh use} = 100 \text{ watts} \times 15 \text{ hrs.} \div 1,000 \text{ watts} = 1.5 \text{ kWh}$

$\text{Your cost} = 1.5 \text{ kWh} \times \$.0834 = \$.125 \text{ or } 12.5 \text{ cents}$

Step 4

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

Example: $\frac{\$100}{30 \text{ days}} = \3.33 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.

Example: $\frac{\$3.33}{4} = \$.83$ per person per day.

Appliance usage

Appliance Category	Typical Energy Usage	Average Monthly Cost at \$.0834/kWh*	Estimated Cost/ Month
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Kitchen/Refrigeration Appliances

Refrigerators

Top Freezer - purchased before 1990	100 kWh/mo	\$8.34	\$
Top Freezer - purchased between 1990 and 1993	70 kWh/mo	\$5.84	\$
Top Freezer - purchased after 1993	55 kWh/mo	\$4.59	\$
Top Freezer - ENERGY STAR®	37 kWh/mo	\$3.09	\$
Side-by-side - purchased before 1990	135 kWh/mo	\$11.26	\$
Side-by-side - purchased between 1990 and 1993	100 kWh/mo	\$8.34	\$
Side-by-side - purchased after 1993	70 kWh/mo	\$5.84	\$
Side-by-side - ENERGY STAR	48 kWh/mo	\$4.00	\$

Freezers

Freezers - standard 12-15 cu. ft.	100-190 kWh/mo	\$8.34-\$15.85	\$
Freezers - frost free 12-15 cu. ft.	150-240 kWh/mo	\$12.51-\$20.02	\$

Dishwasher

Dishwasher - ENERGY STAR	25-38 kWh/mo	\$2.09-\$3.17	\$
Dishwasher - non-ENERGY STAR	40-50 kWh/mo	\$3.34-\$4.17	\$

Electric Oven - 30 minutes daily

48 kWh/mo \$4.00 \$

Electric Stove Top - 45 minutes daily

36 kWh/mo \$3.00 \$

Microwave Oven

22 kWh/mo \$1.83 \$

Toaster Oven

9 kWh/mo \$0.75 \$

Toaster

3 kWh/mo \$0.25 \$

Slow Cooker (crock pot)

3 kWh/mo \$0.25 \$

Coffeemaker

30 kWh/mo \$2.50 \$

Laundry

Clothes Washer - ENERGY STAR*	200-420 kWh/mo	\$16.68-\$35.03	\$
Clothes Washer - non ENERGY STAR*	450-900 kWh/mo	\$37.53-\$75.06	\$
Clothes Washer - (cold water wash)	7 kWh/mo	\$0.58	\$
Clothes Dryer	4 kWh/load	# load/mo x \$.33	\$
Iron	6 kWh/mo	\$0.50	\$

*Hot Water Wash

†Central Air Conditioners

SEER

		7	10	12	13	14	
Central Air Cond. (2 ton)	2-3 kW/hr	\$52	\$37	\$31	\$28	\$26	\$
Central Air Cond. (2 1/2 ton)	2-3 kW/hr	\$66	\$46	\$38	\$35	\$33	\$
Central Air Cond. (3 ton)	3-4 kW/hr	\$79	\$55	\$46	\$42	\$39	\$
Central Air Cond. (4 ton)	4-5 kW/hr	\$105	\$73	\$61	\$56	\$52	\$

SEER = Seasonal Energy Efficiency Ratio. Higher SEER means more energy efficient.

ENERGY STAR central air conditioners = 13 SEER or greater

†Room Air Conditioners

EER

		7	9	11	
5,000 Btuh (.42 ton)	.45-.7 kW/hr	\$11	\$8	\$7	\$
8,000 Btuh (.67 ton)	2-3 kW/hr	\$17	\$14	\$11	\$
12,000 Btuh (1 ton)	3-4 kW/hr	\$26	\$20	\$17	\$

EER = Energy Efficiency Ratio. Higher EER means more energy efficient.

ENERGY STAR room air conditioners = 10.7 EER or greater.

*\$.0834 per kWh was the average electricity cost in the U.S. for 2002. Refer to your electric bill for the actual electric rates. Actual costs may vary from estimated costs according to age and usage of appliance.

†Central and room air conditioning costs based on an average summer of 550 cooling hours.

Lighting

Incandescent, 100 Watts	11 kWh/mo	\$0.92	\$
Compact Fluorescent 27 Watts (replacing 100 Watts)	3 kWh/mo	\$0.25	\$
Incandescent, 75 Watts	8.25 kWh/mo	\$0.69	\$
Compact Fluorescent 23 Watts (replacing 75 Watts)	2.5 kWh/mo	\$0.21	\$
Incandescent, 60 Watts	6.6 kWh/mo	\$0.55	\$
Compact Fluorescent 20 Watts (replacing 60 Watts)	2.2 kWh/mo	\$0.18	\$
Incandescent, 40 Watts	4.4 kWh/mo	\$0.37	\$

Miscellaneous

Electric Water Heater (typical family of four)	400-600 kWh/mo	\$33.36-\$50.04	\$
Electric Water Heater - Off Peak (\$.035/kWh)	400-600 kWh/mo	\$14.00-\$21.00	\$
Dehumidifier (40 Pint)	200-400 kWh/mo	\$16.88-\$33.36	\$
Air Cleaner	50-100 kWh/mo	\$4.17-\$8.34	\$
Furnace Fan (automatic)	100-200 kWh/mo	\$8.34-\$16.68	\$
Furnace Fan (constant)	250-500 kWh/mo	\$20.85-\$41.70	\$
Ceiling or Window Fan	25-50 kWh/mo	\$2.09-\$4.17	\$
Heat Recovery Ventilator	25-50 kWh/mo	\$2.09-\$4.17	\$
Whole House Fan	100-200 kWh/mo	\$8.34-\$16.68	\$
Water Bed Heater (with thermostat)	150-200 kWh/mo	\$12.51-\$16.68	\$
Hair Dryer	10 kWh/mo	\$0.83	\$
Aquarium Heater	40-80 kWh/mo	\$3.34-\$6.67	\$
Engine Block Heater	.6-1.5 kW/hr	\$12.01-\$30.02	\$
Heat Tape (150 ft, 7 W/ft.) 4 hr/day	126 kWh/mo	\$10.51	\$
Hot Tub Heater (inside)	1.5-3.5 kW/hr	\$15.64-\$36.49	\$
Hot Tub Heater (outside)	3.5-6.0 kW/hr	\$35.00-\$60.00	\$
Space Heater 4hr/day	.5-1.5 kW/hr	\$5.00-\$25.00	\$
Pool Pump (1 hp)	.75-1 kW/hr		\$
12 hours/day		\$22.52-\$30.02	\$
24 hours/day		\$45.04-\$60.05	\$
Well Pump	40-80 kWh/mo	\$3.34-\$6.67/mo	\$
TV - Color - 25"	15-90 kWh/mo		
2 hrs/day		\$1.25	\$
6 hrs/day		\$3.75	\$
12 hrs/day		\$7.51	\$
VCR, Games, Stereo	24-48 kWh/mo	\$2.00-\$4.00	\$
Personal Computer	48-96 kWh/mo	\$4.00-\$8.00	\$

Volts x Amps = Watts

TOTAL

Watts/1,000 = Kilowatts (KW)

Fixed Charge

KW x 1 hour of use = 1 Kilowatt hour (kWh)

Subtotal

kWh x \$.0834*/kWh = Cost to operate appliance

Tax

TOTAL

*\$.0834 per kWh was the average electricity cost in the U.S. for 2002. Refer to your electric bill for the actual electric rates. Actual costs may vary from estimated costs according to age and usage of appliance.

Meter

monitor chart

Using this meter monitor chart, take a few minutes each day (preferably at the same time) and jot down your electric meter reading. Start the first day of the month.

By subtracting the previous day's reading from the current reading each day, you get the number of kilowatt-hours used during that 24-hour period. By adding the daily figures into a weekly total, you can see how much—and when—your family used power during that month.

As you know from reading this guide, your energy use will fluctuate with your daily activities. Monitoring your kilowatt-hours is the first step to understanding your electric use.

Daily Reading	kWh Used Daily	Record of Daily Activities that Affect Your Energy Use
1		
2		
3		
4		
5		
6		
7		
Weekly Total		
8		
9		
10		
11		
12		
13		
14		
Weekly Total		
15		
16		
17		
18		
19		
20		
21		
Weekly Total		
22		
23		
24		
25		
26		
27		
28		
Weekly Total		
29		
30		
31		
Extra Days Total		
MONTHLY TOTAL		

Vacation and seasonal use

When vacation time comes, and you're 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 the following questions:

1. Was the water heater turned down or off during your vacation? Remember, if the electric water heater is left energized during your vacation, it will continue to operate and maintain the tank temperature even if you're not using any hot water.
2. Were the refrigerators and freezers emptied and turned off? If not, they will continue to operate to maintain the preset temperatures.
3. Did other appliances keep running while you were on vacation? Clocks, fans and power ventilators, heating and air conditioning equipment, lights, personal computers, fax machines and even TV sets use some energy for their "instant-on" feature.

Make arrangements

Perhaps you can make arrangements with a neighbor to keep an eye on your place and adjust the heat, water heater and/or air conditioner 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. If you intend to be gone for an extended period of time, contact the energy experts at your electric cooperative and make arrangements so your electric service will remain uninterrupted.

Read your meter upon leaving and again when you return. This will let you determine the number of kilowatt-hours used while you were gone.

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

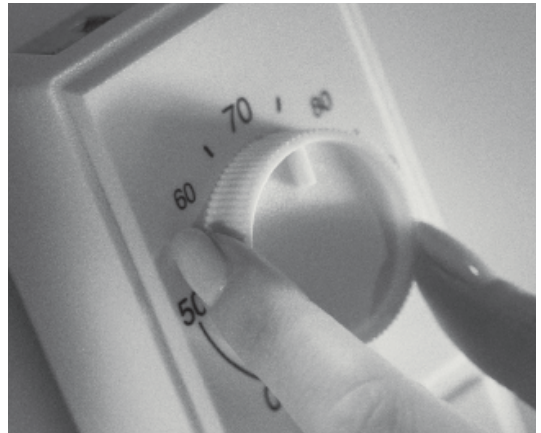
energy and money

Great River Energy and your local electric cooperative offer some simple steps to help reduce your energy costs. Using combinations of the following measures can save you 10 percent to 50 percent on your energy bills.

- Adjust thermostats. Turn down your thermostat during cool months and turn it up when air conditioning, especially when the building is not occupied. Install a programmable thermostat to accommodate your weekly schedule.
- Reduce hot water temperature. Reducing the temperature on your water heater thermostat can decrease heat loss from your tank. For washing hands, you may be able to turn the temperature to 110 degrees F (43 degrees C). Dishwashing may require higher temperature settings such as 130 degrees F (54 degrees C). Many dishwashers now have a temperature boost, allowing for a lower water heater temperature.
- Install water flow restrictors and aerators in sink faucets. These measures save money by reducing water use (including hot water).
- Reduce lighting expenses by turning lights off when not in use. Compact fluorescent lighting is the most efficient lighting on the market today. These bulbs use 70 percent less energy and last up to 10 times longer than incandescent bulbs. Several wattage sizes are available to fit any lighting needs.
- Seal heating and cooling ductwork. Leakage from areas such as joints, elbows and connections can be substantial — as much as 20 percent to 30 percent. This is especially costly if the ducts travel through unheated or uncooled spaces such as attics, basements or crawl spaces. Use duct tape or caulk to seal ducts.
- Install proper amounts of insulation to save heating and cooling energy. We recommend insulation values of R-45 or more in the ceiling and attic, and R-20 or more in the walls.
- Replace air filters regularly and follow maintenance schedules for furnace and air conditioning equipment. Replacing a dirty air filter can save money by reducing the amount of electricity needed to run a blower motor

(because there is less resistance to airflow with a clean filter).

- Clean heat exchangers and perform routine maintenance on refrigeration equipment. These simple measures will ensure the most efficient operation of heat exchangers needed for cooling.
- Seal off unused areas and don't heat or cool them. Storage areas are a good place to start.



- Turn off equipment when not in use. Don't underestimate the energy savings realized by turning off or unplugging unused televisions, stereos, computers, etc.
- Seal exterior cracks and holes and ensure tight-fitting windows. Small cracks or holes in the building exterior (like walls, windows, doors, ceilings and floors) can really add up to substantial heating or cooling losses. Install weather stripping and caulking to stop air leaks.
- Shade sun-exposed windows and building walls. Sunlight streaming through windows in the summer can substantially increase air conditioning costs. During the cooling season, use shading methods (like window coverings, awnings, trees and bushes) wherever possible.
- Don't heat or cool the outdoors. Keep exterior doors closed as much as possible. Block and insulate unneeded windows and other openings. Aside from the important security benefit, covering unneeded windows and doors can greatly reduce energy losses.
- Be energy conscious when replacing appliances. Buy ENERGY STAR appliances whenever possible.

We're here to help

Your electric cooperative is willing and ready to do whatever it takes to help make your home as energy efficient as possible. So, ask the energy experts at your cooperative what else they can do to help you get the most from your energy dollar.

Great River Energy member cooperatives

Agralite Electric Cooperative

Phone: 320-843-4150

Web site: www.agralite.coop

Arrowhead Electric Cooperative

Phone: 218-663-7239

Web site: www.aecimn.com

BENCO Electric

Phone: 507-387-7963

Web site: www.BENCO.org

Brown County Rural Electrical Association

Phone: 507-794-3331

Web site: www.browncountyrea.coop

Connexus Energy

Phone: 763-323-2600

Web site: www.connexusenergy.com

Cooperative Light & Power Association

Phone: 218-834-2226

Web site: www.clpower.com or www.lakenet.com

Crow Wing Power

Phone: 218-829-2827

Web site: www.cwpower.com

Dakota Electric Association

Phone: 651-463-6212

Web site: www.dakotaelectric.com

East Central Energy

Phone: 800-254-7944

Web site: www.eastcentralenergy.com

Federated Rural Electric Association

Phone: 507-847-3520 or 800-321-3520

Web site: www.federatedrea.coop

Goodhue County Cooperative Electric Association

Phone: 507-732-5117

Web site: www.gccea.com

Itasca-Mantrap Cooperative Electric Association

Phone: 218-732-3377

Web site: www.itsasca-mantrap.com

Kandiyohi Power Cooperative

Phone: 320-235-4155

Web site: www.kpcoop.com

Lake Country Power

Phone: 800-421-9959

Web site: www.lakecountrypower.coop

Lake Region Electric Cooperative

Phone: 218-863-1171 or 866-367-5732

Web site: www.lrec.coop

McLeod Cooperative Power Association

Phone: 320-864-3148 or 800-494-6272

Web site: www.mcleodcoop.com

Meeker Cooperative

Phone: 320-693-3231

Web site: www.meeker.coop

Mille Lacs Energy Cooperative

Phone: 218-927-2191

Web site: www.mlecmn.net

Minnesota Valley Electric Cooperative

Phone: 952-492-2313 or 800-282-6832

Web site: www.mvec.net

Nobles Cooperative Electric

Phone: 507-372-7331

Web site: www.noblesce.coop

North Itasca Electric Cooperative

Phone: 218-743-3131

Web site: www.northitascaelectric.com

Redwood Electric Cooperative

Phone: 507-692-2214

Runestone Electric Association

Phone: 320-762-1121

Web site: www.runestoneelectric.com

South Central Electric Association

Phone: 507-375-3164

Web site: www.southcentralelectric.com

Stearns Electric Association

Phone: 320-256-4241 or 320-259-6601

Web site: www.stearnslectric.org

Steele-Waseca Cooperative Electric

Phone: 507-451-7340 or 800-526-3514

Web site: www.swce.coop

Todd-Wadena Electric Cooperative

Phone: 218-631-3120 or 800-321-8932

Web site: www.toddwadena.coop

Wright-Hennepin Cooperative Electric Association

Phone: 763-477-3000 or 800-943-2667

Web site: www.whe.org



For more money-saving energy efficient ideas, visit these web sites:

www.commerce.state.mn.us

www.eren.doe.gov

www.aceee.org

www.eere.energy.gov

www.energystar.gov

www.ftc.gov

www.energy.gov

