E-ACCESS

E-BILL / ONLINE PAYMENTS

FREE HOME ENERGY AUDITS

LOW-FLOW SHOWERHEAD EXCHANGE PROGRAM

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH

200 Canal Street
New Smyrna Beach, FL 32168
(386) 427-1361
www.ucnsb.org

UTILITIES COMMISSION CITY OF NEW SMYRNA BEACH

Connecting you with the Quality of a New Smyrna Beach Life

How To Save On Your Electric Bill

2011-2012

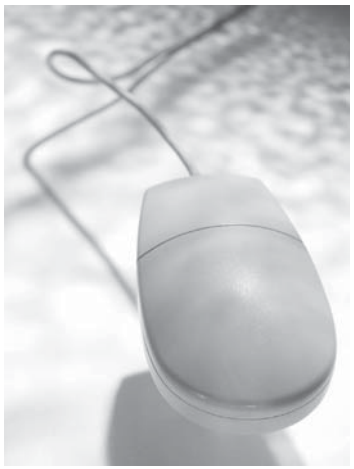
5 Getting help

• Plug into UCNSB for Assistance

As your municipal electric utility, UCNSB is dedicated to helping you use energy wisely. If you have concerns about your home energy usage, comfort, or home appliances, we can help. Through our free Energy Audit Program, a certified State of Florida Energy Rater will come to your home and work closely with you to identify and correct problems that cause high energy consumption. UCNSB provides these services ***FREE OF CHARGE***. It's all part of our commitment to our customers.

Contact Us

Call us at **386-427-1361** to reach UCNSB's customer service department.



For details about UCNSB products and services, visit our web site at **www.UCNSB.org**

Why waste money?

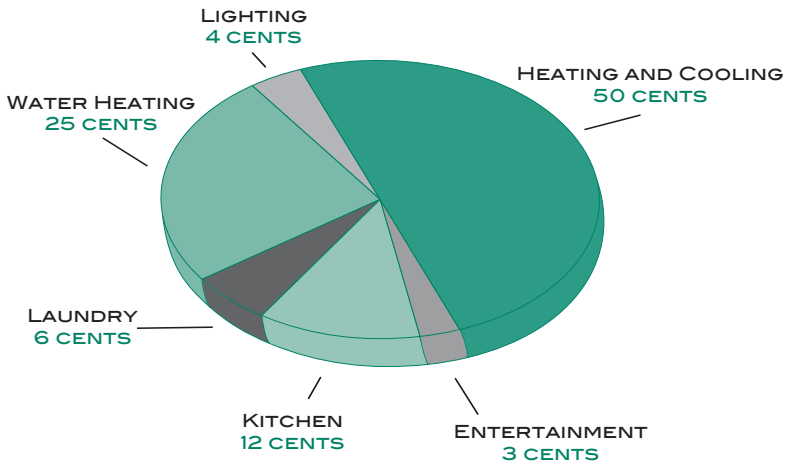
Unless you have money to burn, you probably don't want to spend more than you need to on your electric bill. But if you use electric appliances and never think about their efficiency or operating cost, you may be seeing your energy dollars go up in smoke.

The good news is, you don't have to. After reading this guide, you can gain control of your UCNSB bill. If you can identify and eliminate excess electric use, you'll trim away wasted energy dollars. In most cases, it simply means being more aware of the electric appliances in your home and operating them more efficiently.

If there are no problems with the equipment in your home, the size of your electric bill will usually depend on how many appliances you have and how you use them. **Most electric bills fluctuate in response to the weather outside**. Air conditioning and heating are major factors. Or, you might add new appliances or have more people living in your home. Any of these factors could cause a jump in your electric bill.

This booklet will help you determine why you may have an unusually high bill. It will help you decide what changes may be needed to reduce your consumption. Remember, if you need help pinpointing your electric usage problem, you can always call UCNSB.

Your Electric Energy Dollar



The graph above shows how your electric energy dollar is typically spent in the home.

Note: All figures and charts in this booklet are based on the all-inclusive rate of 12 cents per kilowatt-hour, and all numbers have been rounded. The figure of 12 cents/kWh includes the base electric rate, plus all applicable state and city or county taxes. The base rate includes a 6% payment to the City of New Smyrna Beach. Residential customers pay 2.5% gross receipts tax to the State of Florida, plus either 9% to the City of New Smyrna Beach or 10% to the County of Volusia.

October 2011
Utilities Commission, City of New Smyrna Beach extends its gratitude to the staff of Southern Maryland Electric Cooperative for their assistance in publishing this booklet.

There are some steps you can take to remedy a moisture problem.

Too much moisture

If you have problems with excessive moisture in your home, the first thing to do is to identify the source of the moisture and then work to eliminate it. Following are some tips:

- Make sure all downspouts are connected. Consider installing long extension spouts to channel water away from your home.
- Inspect and repair flashing details around your home.
- Get into the habit of running the exhaust fans in your bathrooms when taking baths or showers.
- Don't let liquids and food simmer uncovered on your stove for unnecessary lengths of time.
- Dry and store firewood outside of your home.
- Make sure your clothes dryer is vented to the outside.

Not enough moisture

It is not uncommon for homes to have a low humidity during the winter. To combat this problem, you can:

- Seal all large holes in the home which lead to the outside.
- Consider installing a humidifier. Make sure a contractor sizes the humidifier correctly to provide the proper level of moisture needed. Take care not to add too much moisture to your home. You'll know that you're adding too much if you see window condensation after operating your humidifier.

temperature and humidity outdoors. In the summer, Rh of less than 60 percent helps promote comfort in the home. In the winter, Rh of 40 percent or less is recommended to promote comfort. Humidity higher than 40 percent can cause condensation of cold windows and surfaces in the home.

The chart below illustrates how humidity can make the air temperature "feel" much warmer than it actually is.

Comfort Index

Relative Humidity	*Air temperature* 70	75	80	85	90	95	100	105	110	115
	Apparent temperature									
	Degrees Fahrenheit									
0%	64	69	73	78	83	87	91	95	99	103
10%	65	70	75	80	85	90	95	100	105	111
20%	66	72	77	82	87	93	99	105	112	120
30%	67	73	78	84	90	96	104	113	123	135
40%	68	74	79	86	93	101	110	123	137	151
50%	69	75	81	88	96	107	120	135	150	
60%	70	76	82	90	100	114	132	149		
70%	70	77	85	93	106	124	144			
80%	71	78	86	97	113	136				
90%	71	79	88	102	122					
100%	72	80	91	108						

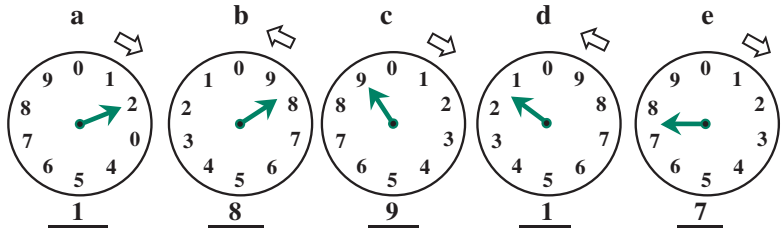
Note: Apparent temperature goes down as the humidity is lowered.

Table of Contents

1 Your electric meter

• Learn to read your own meter

Your electric meter measures the amount of electricity you use in kilowatt-hours (kWh). One kWh is equal to using 1,000 watts of electricity for 1 hour. Ten 100-watt bulbs burning for one hour would consume one kilowatt-hour of electricity. Your monthly electric bill is based on the amount of kWh you use.



The example above shows the dials on a five-dial meter. (Most UCNSB meters have five dials; some have four.) To read the meter, begin with the right-hand dial (e) and record numbers right to left (e-a).

The pointers of the dials move in the direction of the hollow arrows. When a pointer is between two numbers (as in dial b), write down the lower number, the number the pointer has gone past. If the pointer is on a number (as in dial a), look at the dial to the right of it (dial b). If the pointer (on dial b) has not passed 0, record the smaller number (for dial a). If the pointer on the dial to the right has passed 0 (as in dial d), record the number the pointer appears to be on (for dial c). The example above would be read as 18917.

contractor may recommend installing additional return ducts, transfer ducts, or other design modifications.

- Be sure that all interior doors are undercut at least one inch to allow air to flow from the various rooms to the return duct. Make certain that carpeting does not block the undercut area.
- Insulate duct work in unconditioned spaces such as an unheated basement, crawlspace, or attic. Uninsulated duct work can cause substantial heat loss going from the heat pump to the supply registers.
- Keep furniture away from supply registers. Blocking registers prevents the heated or cooled air from being distributed evenly.

• Control the humidity factor

There's an old saying that goes, "It's not the heat that gets me during the summer in Florida, it's the humidity!" As you know, humidity can make hot temperatures seem absolutely steamy; it can also put a chilling bite in cold temperatures.

Relative humidity (Rh) is a measure of how much moisture is in the air. It is a ratio that indicates the ability of the air to absorb more moisture. This ratio is expressed as a percentage. The lower the percentage, the less moisture is found in the air, and the greater potential for the air to absorb additional moisture. When the air reaches 100 percent relative humidity, it is completely saturated.

The amount of water vapor in the air determines the rate at which your body dissipates heat. The more humidity the air has the more heat it can hold.

The Rh in a home can be affected by many factors, including the amount of air leaks, the amount of moisture generated within the home's shell, and the

opening of doors and windows. You're working against your climate control system if you let the outdoor air mix directly with the climate you're trying to maintain inside.

• Be sure your duct work does its job

A large factor in comfort is your home's duct system. A typical system loses 20 to 30 percent of its heating or cooling capacity.

One way the system loses efficiency is through conduction of heat through the duct walls. In the heating mode, the hot air inside the ducts warms the duct walls. They, in turn, warm the cold air surrounding them. When this warmed air escapes to the outdoors, the heat will never reach the rooms of the house.

Poor duct layout can also have a negative impact on comfort. Many homes have a supply duct for each room, but only a single return duct in a central location within the house. When interior doors are closed, it is difficult for the air in these rooms to circulate back to the return duct. The pressure in the closed-off rooms increases, while the pressure decreases in rooms open to the return duct. This can cause pressure differences within the home. The uneven pressure will increase air leakage. Rooms without returns and those with closed doors could feel colder in the winter and hotter in the summer.

The way the supply air diffusers and return air grilles are selected and laid out in the conditioned space is called room air distribution. This system uses forced air convection currents to assure comfort. If air moves too slowly, temperatures within the space will be uneven and you may feel stuffy. If the air moves too rapidly, you might be bothered by the draftiness and cold.

Here are some things you can do to ensure proper air flow:

• Have a heating and cooling contractor check to be sure duct work is free of air leaks and is functioning properly. Your

• Use your meter to check appliance usage

If you want to know the exact amount of electricity used by a certain appliance in your home, you can use the disc wheel on the meter to find out.

• Turn off breakers or fuses to all electrical appliances except for the appliance to be measured.

• Go to the electric meter and count the revolutions of the disc on the meter while timing with a stop watch. Record the time in seconds for 10 revolutions of the disc.

• Look at the Kh symbol on the meter, and the small number after it. On most meters the number is 7.2. Every time the disc wheel goes around, that's how many watt-hours are consumed.

• Use the formula shown below to calculate how much wattage the appliance is drawing. Use 3.6 as indicated in the formula—it is a constant. Then multiply the kW electric use by 1 hour and multiply this by the energy cost of $0.12 per kWh.

For Example: A customer's meter has a Kh constant of **7.2**. (Remember to look at the meter nameplate for this number.) A 3-ton air conditioner makes the meter disc go around **10** revolutions in **87** seconds. Assume an average electric cost of $0.12 per kWh. As you can see in the calculations below, the air conditioner draws **2.98** kW and costs **$0.36** per hour to operate.

Formula for Estimating Kilowatts

$$\frac{\text{Revolutions}}{\text{Time in Seconds}} \times 3.6 \times \text{Kh} = \text{kilowatts}$$

Cost of Operating a 3-ton Air Conditioner

$$\frac{10 \text{ Revolutions}}{87 \text{ Seconds}} \times 3.6 \times 7.2 = 2.98 \text{ kW}$$

$$2.98 \text{ kW} \times 1.0 \text{ hour} \times \$0.12 / \text{kWh} = \$0.36$$

2 Basic Appliances

• The operating cost of household appliances

When you pay your electric bill, you are paying for kilowatt-hours (kWh). The average monthly kWh consumption for many common home appliances is listed in the following tables. (Electric use tables for large appliances are listed separately in other sections of this booklet.) Use these figures to estimate how much an individual appliance contributes to your bill. You can then identify costly appliances and make changes to control your electric bill.

Appliance	*Typical Wattage*	*Average Use*	*Average Monthly kWh Use*	*Average Cost Per Month **
Air cleaner: furnace mount	35	24 hours / day	25	$3.00
Air cleaner: portable	20	24 hours / day	14	1.68
	100	24 hours / day	72	8.64
	275	24 hours / day	198	23.76
	350	24 hours / day	252	30.29
Aquarium: 20 gallon @75°	30	24 hours / day	22	2.64
55 gallon @75°	80	24 hours / day	60	7.20

**Based on the all-inclusive rate of 12 cents per kilowatt-hour.*

• Regulate the air temperature

One of the biggest factors affecting comfort is air temperature. Most people feel comfortable between 68° and 78°. These "ideal" temperatures vary with the level of activity, clothing, and personal preference.

Your body is designed to function in a healthy manner at an inner body temperature of about 98.6°. In order to maintain that temperature, any excess heat must be rejected. In a conditioned space, the body always generates more heat than needed. So your body is constantly transferring heat to the air around you.

Radiant temperature is the temperature of the walls, ceiling, floors, and furnishings. Radiant heat can affect comfort when the heat leaves your body and flows to colder surfaces surrounding you in conditioned spaces. For example, if you were seated at a desk situated near an outside wall, your body heat could flow from you to the colder wall nearby. The colder the wall is, the more rapidly the heat would leave your body. Even when the air temperature surrounding you is acceptable, the temperature of the surfaces surrounding you can cause discomfort if the nearby surfaces are very cold or hot.

A few simple tips will help you to feel more comfortable with the temperatures around you.

- Install insulated drapes or curtains on large windows and doors with lots of glass. Make sure that drapes don't block baseboards or supply registers.
- Close window coverings in the summer and keep them open in winter. Radiant heat from the sun can add heat to the home in winter and increase comfort. In the summer, it's best to block out the sun's heat to keep your home cool.
- Dress appropriately for the season and the thermostat setting you select. Layers of clothes will help you retain body heat during cold weather. When it's warm, light clothing will make it easier to release unwanted heat.

- During extra hot or extra cold weather, avoid excessive

When should you have a load calculation done? If you are building a new home, a load calculation should be completed using the house plans. If you have put an addition on your home, have added insulation to your attic or crawl space, or made other efficiency improvements to the structure of the home, a load calculation is also recommended.

If you are simply replacing existing equipment and have never experienced major comfort problems, a load calculation may not be necessary.

4 Staying Comfortable

• Maximize your comfort zone

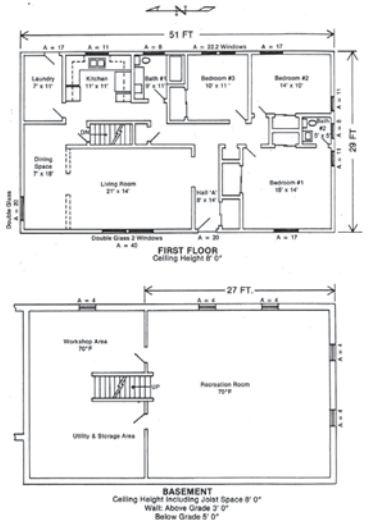
Comfort is one of the driving forces of your electric energy bill. If you're shivering in your living room on a winter afternoon, your impulse is to turn up the heat. If you're sweating on a summer evening, you'll probably want to turn down the air conditioning. But there are many steps you can take to maximize your comfort zone. Not all of them involve reaching for the thermostat.

Most people don't think about comfort as much as they do discomfort. Comfort is something you take for granted. The subject comes up only when you feel **uncomfortable**. To establish your comfort zone, you must control the factors that can cause discomfort. These factors include air temperature, air distribution, and humidity.

Appliance	*Typical Wattage*	*Average Use*	*Average Monthly kWh Use*	*Average Cost Per Month **
Blanket, electric	180	8 hours / night	21	$2.52
Bug zapper:				
Small	20	24 hours / day	14	1.68
Large	80	24 hours / day	58	6.96
Cable T.V. converter box	22	6 hours / day	4	.48
Clock	3	24 hours / day	2	.24
Clothes dryer				
Thermostat control	5,500	6 loads / week	88	10.56
Moisture sensor	5,500	6 loads / week	53	6.36
Clothes washer (does not include cost of hot water)	510	6 loads / week	9	1.08
Coffee maker (drip)	1,000	Once / day	9	1.08
Compactor, trash	460	Once / day	1	.12
Computer				
PC desktop	150	8 hours / day	36	4.32
Laser printer	70	2 hours / day	4	.48
Dehumidifier				
15 pint capacity	350	12 hours / day	126	15.12
20 pint capacity	480	12 hours / day	173	20.76
40 pint capacity	625	12 hours / day	225	27.80
Dishwasher (does not include cost of hot water)	1,200	25 loads / month	15	1.80
Fans, medium speed				
Ceiling, 4-foot diameter	40	24 hours / day	29	3.48
Oscillating, 12-inch	35	24 hours / day	25	3.00
Box, 20-inch	100	24 hours / day	72	8.64
Whole house, 30-inch	400	24 hours / day	288	34.56
Fence, electric	10	24 hours / day	7	.84
Garage door opener	800	2 times / day	5	.60
Hair dryer				
Low	250	5 times / week	1	.12
Medium	500	5 times / week	2	.24
High	1,000	5 times / week	4	.48
Heat tape	25	24 hours / day	18	2.16
Heater, engine block	1,000	12 hours / night	360	43.20
Heater, portable				
Low	500	12 hours / night	180	21.60
Medium	750	12 hours / night	270	32.40
High	1,500	12 hours / night	540	64.80
Heating pad	65	4 hours / day	8	$.96

Depending on its horsepower and the total hours of use, a pool pump could cost between $28 and $70 to operate per month while your pool is open.

Appliance	*Typical Wattage*	*Average Use*	*Average Monthly kWh Use*	*Average Cost Per Month **
Humidifier (console model)				
Evaporative	30	6 hours / day	5	.60
Mist	350	6 hours / day	63	7.56
Ultrasonic	50	6 hours / day	9	1.08
Steam vaporizer	500	6 hours / day	90	10.80
Lighting (incandescent)				
40-watt bulb	40	6 hours / day	7	.84
60-watt bulb	60	6 hours / day	11	1.32
100-watt bulb	100	6 hours / day	18	2.16
Microwave oven				
Small	500	20 minutes / day	5	.60
Large	1,500	20 minutes / day	15	1.80
Oxygen generator	350	24 hours / day	252	30.24
Pool pumps				
½ horsepower	600	12 hours / day	216	25.92
¾ horsepower	860	12 hours / day	310	37.20
1 horsepower	1,070	12 hours / day	385	46.20
1½ horsepower	1,500	12 hours / day	540	64.80
Radio	75	3 hours / day	7	.84
Range, burners				
6" burner, high setting	1,300	1 hour / day	39	4.68
8" burner, high setting	2,350	1 hour / day	70	8.40
Range, oven	3,300	1 hour / day	100	12.00
Self-clean cycle	1,500	2 times / month	10	1.20
Roof ventilator (1/20 hp)	175	10 hours / day	53	6.36
Sewage pump	600	20 minutes / day	6	.72
Sewing machine	75	2 hours / day	5	$.60



Heating and Cooling Equipment Sizing

Residential heating and cooling equipment must be designed and sized correctly for your home. Temperature, humidity, air movement, and energy efficiency all rely on a properly designed system. This should be a primary consideration if you are having new heating and cooling equipment installed.

The basis for an efficient heating and cooling system is a **load calculation**. A load calculation helps match the design of your home with the equipment needed to keep it comfortable. Your heating and cooling contractor should provide a load calculation because they are responsible for properly installing your system.

A load calculation is based on the following 12 factors:

- Measurements of the structure
- Walls
- Windows
- Doors
- Attic
- Floors
- Roof color
- Compass orientation of the house
- Insulation levels in the walls, attic, and crawlspace
- Structure material used for the building
- Ductwork location
- Number of people living in the home

refrigerator or freezer in the basement to reduce some of the extra heat. These appliances can produce substantial amounts of waste heat doing their jobs—about as much as a 200-watt light bulb operating continuously.

• Do not position heat-producing appliances, such as televisions or lamps, near the thermostat. The heat they produce can "fool" the thermostat, causing the unit to run longer than needed.

• Make sure furniture does not obstruct the air conditioning vents.

• Do not enclose the outdoor unit! A top discharge unit (one which blows air out the top) needs two feet of clearance above the top. Do not place the outdoor unit under a deck unless there is a minimum clearance of three to five feet at the top. Blocking discharge air causes warm air to be recirculated back into the outdoor unit, increasing operating costs.

• Compare the temperature on the thermostat with the temperature of the air coming out of the supply registers. The difference between these two temperatures should be between 16° and 22°. Smaller temperature differences may indicate a problem with the air conditioner, like a low refrigerant charge, a dirty air filter, or excessive duct leakage.

If you normally keep your thermostat set at 78°, then nudge it lower, you'll see the following jumps in your cooling costs:

Move setting to:	See costs go up:
76°	13%
74°	24%
72°	35%
70°	48%

Appliance	*Typical Wattage*	*Average Use*	*Average Monthly kWh Use*	*Average Cost Per Month **
Shaver	15	2 times / day	1	.12
Toaster	1,100	2 times / day	3	.36
Television, color				
14- to 19-inch	70	6 hours / day	13	1.56
23- to 26-inch	130	6 hours / day	23	2.76
VCR	25	6 hours / day	5	.60
Vacuum	630	10 minutes / day	3	.36
Waterbed, king-size (90°)				
Unmade	350	Every day	160	19.20
Two blankets	350	Every day	130	15.60
Comforter	350	Every day	120	14.40
Well pump	1,000	15 hours / month	15	1.80
Whirlpool tub	1,800	1 hour / week	7	.84

• Figuring the cost of appliance use

Do you have an appliance that's not listed on our charts? Well, you can easily figure out the cost of operating that appliance for one day or for the whole month if you know its rating in watts, how much time you operate the appliance, and the cost of electricity. Use the following formula:

A		**B**		**C**		**D**
appliance rating (converted from watts to kilowatts)	X	use in hours	X	cost per kWh	=	cost of operating the appliance over the given period of use

• **Figure A:** The rating in watts can usually be found labeled on the appliance. Remember, 1,000 watt-hours equals one kWh, the unit of electrical energy you use and pay for each month. You'll need to convert the watts rating to kilowatts by dividing the watts by 1,000.

• **Figure B:** You can estimate how many hours this appliance is kept on during the course of a day.

• **Figure C:** The cost of electricity is 12 cents per kWh.

On the appliance charts in this booklet, the average cost per month has been calculated so you can apply the information to your electric bill. You can use the formula above to calculate the cost of operation during a given period of use. To get the monthly amount, you must multiply **Figure D** by the number of times this interval takes place during the month to get your monthly figure.

You may run your dishwasher 25 times during a month, or activate your garage door opener twice a day or 60 times during a month. You might only operate your mixer once a week for periods of 15 minutes each.

Operating Costs for Central Air Conditioning

Size in Tons	Seasonal Energy Efficiency Rating (SEER)						
	9	10	11	12	13	14	15
1.5	$220	$195	$170	$145	$120	$100	$80
2.0	280	255	230	205	180	155	130
2.5	340	315	290	265	240	215	190
3.0	400	370	345	320	300	275	250
3.5	455	430	405	380	355	330	305
4.0	515	490	465	440	415	390	365
5.0	630	605	580	560	535	510	485

There are several steps you can take to reduce cooling costs:

• Do not set the thermostat lower than the desired temperature when you first turn it on. If you try this it will not cool faster. It will only cool to a lower temperature than necessary and waste energy in the process.

• Try to raise the thermostat to between 83° and 85° when no one is home during the day. You may reduce cooling costs by 15 percent.

• Try to keep the thermostat set at 78°. Lower settings will dramatically increase your costs, as you can see in the table on the next page. (Amounts shown represent costs per season.)

• Use a fan in conjunction with an air conditioner. This will allow you to economize by setting the air conditioner higher (warmer) while providing the same comfort. During a hot day, even a small breeze from a floor, table, or ceiling fan can make you feel between 4° and 8° cooler, as well as reduce the stuffy feeling from a closed-up house. Even at high speed, a large table or ceiling fan uses only as much energy as a large light bulb—far less than any air conditioner.

• Make sure that the secondary refrigerator or freezer is located in a cool place in your home. You may be able to put the

is between 35° and 45°. During defrost, the heat pump switches to the cooling cycle, which means that the air going to the rooms will be cold. Usually, one stage of electric heat is turned on to temper the air during the defrost cycle. Following are some symptoms of defrost problems: a) Frost remains on the outdoor unit after the defrost cycle; b) The large or "fat" refrigerant line develops frost; c) The defrost cycle lasts longer than 15 minutes; or d) frost build-up is only on the lower part of the outdoor coil.

• Know your electric furnace

An electric furnace is the most expensive heating system to operate. Because of the duct system, an electric furnace could potentially cost 20 to 30 percent more to run than baseboard electric heat.

There are two major ways to reduce electric bills: thermostat setback and repair of duct leaks.

You can cut your electric usage by setting your thermostat back overnight, or when no one is home for 8 hours or more.

You can also save on electric furnace heating costs by checking duct work and repairing any duct leakage. See Pages 28 and 29 for more information on duct leakage.

Remember to check your filter once a month and replace or clean it as needed.

• Use air conditioning wisely

Your summer cooling bills depend a great deal on your central air conditioner's size (in tons) and its Seasonal Energy Efficiency Rating (SEER).

The higher the SEER, the greater the energy efficiency of the unit. The average central air conditioner sold in 1988 has a SEER of about 9. Units built after January 2005 have a minimum SEER of 13. As the table on the next page shows, your average summer cooling bill could range from $80 to $630, depending on the size and efficiency of your air conditioner.

Let's say your mixer is 120 watts or .12 kW (120/1000). You use the mixer about 15 minutes each week. .12 x .25 (1/4 hour) x $.12 = $.0036 per usage. Multiply this weekly use times 4 to calculate the monthly cost of $.0144.

There are other, more complicated methods of calculating electric energy costs. These methods can involve special monitoring equipment or the counting of meter disc revolutions.

When you're trying to control your electric bill, the simple formula used here can help guide you to more economic appliance usage. Contact UCNSB if you need more specific information.

• Standby power

Many household appliances draw energy not only when they are in use, but also when the power is switched off. This phenomenon is known as standby power.

Any appliance with an external power supply or plug-in wall transformer uses electricity constantly. The top 10 appliances contributing to standby energy use, from the highest to the lowest, are shown in the following table.

The average standby power in a home is between 50 to 115 watts, or about 400 to 1,000 kilowatt-hours per year ($52 to $130 annually).

	Typical Wattage	Average Monthly kWh Usage	Average Cost Per Month
Security alarm system	15	11	$1.32
Digital satellite system	15	11	1.32
Cable box	12	9	1.08
Compact audio system	11	8	.96
Copier	10	7	.84
TV/VCR combination	9	6	.72
Color TV	6	5	.60
VCR	5	4	.48
Garage door opener	5	4	.48
Microwave oven	4	3	.36

The simplest way to control standby power usage is to unplug appliances when they are not in use. While this may not be practical for programmed appliances, unplugging these appliances during vacations can produce energy savings.

• Operate refrigerators and freezers efficiently

The energy efficiency of refrigerators and freezers has improved dramatically in the past 20 years. But these appliances are still among the largest energy consumers in the home.

The way you operate your refrigerator and/or your freezer can influence your operating cost. Remember to read the owner's manual carefully and follow these energy-saving tips:

- A freezer should be kept at 0°. Lowering the temperature to -5° will increase energy use by an average of 18 percent.
- On top-mount refrigerators, an "energy-saver" switch operates a heater to keep the moisture from forming around the door frame or on the outside of the cabinet. To conserve energy, use the "reduces moisture" position only when condensation is apparent. These heaters can use from 15 to 40 kWh a month.
- Do not place a refrigerator or freezer in a garage or in an outdoor shed. During the summer months, electric use can double for an outdoor unit.

The following tables illustrate the average monthly operating cost for refrigerators and freezers of various ages and types. You'll notice how much energy efficiency has improved over the years and how much you can save on your electric bill by investing in a newer model.

temperature of the air coming out of the supply registers. The difference between these two temperatures should be between 18° and 30°, depending on the outdoor temperature. To conduct this test, let the heat pump run for 10 to 15 minutes without the auxiliary (aux) light on the thermostat coming on. Then, take a thermometer and find the air temperature at several supply registers. Subtract the thermostat temperature from the supply air temperature to determine the rise. Temperatures higher than 100° to 105° from the air supply registers mean the electric heat is on. Compare the rise with the values in the table on the previous page. Smaller temperature rises may indicate a heat pump problem—like a low refrigerant charge, a dirty air filter, or excessive duct leakage.

4. Check for duct leakage, which can account for 10 to 30 percent of total heating costs. On a day when outside temperatures are below 40°, set the thermostat fan switch from "auto" to the "on" position. Measure the air temperature at all supply and return registers. If there is more than a 6° to 8° difference between the supplies and returns, you may have duct leakage. Long, uninsulated duct runs in unheated basements or attics can also produce large temperature differences between supply and return registers. Because the heat pump runs longer, these large temperature differences can mean higher winter bills.

Problem:

The outdoor unit has a large build-up of frost.

Solution:

Check heat pump defrost cycles. Most heat pumps go into defrost once every 60 to 90 minutes when the outdoor temperature

4. Turn off the heat pump at the thermostat, then check the pressure switch on the outdoor unit. After resetting the pressure switch, turn the unit back to "on." Frequent resetting of the pressure switch is an indication of system problems.

NOTE: Pressure switches are not on all heat pumps.

Problem:

Your heat pump runs continuously, or is producing little heat.

Solution:

1. Check your heat pump's performance. Once the heat pump turns on, wait five minutes and go to the outdoor unit. The outdoor fan should be running. Find the "fat" refrigerant line covered with black insulation and carefully touch the uninsulated portion. This line should be very hot to the touch (use caution) if the heat pump is working well. If the line feels warm or cold, the system may need repair.

Outside Temperature	Temperature Rise
50°	28°-30°
45°	26°-28°
40°	24°-26°
35°	22°-24°
30°	20°-22°
25°	18°-20°

2. Check the thermostat settings and indicator lights. If the auxiliary (aux) light stays on frequently or continuously when outdoor temperatures are above 40°, then you should talk to a service technician. Some heat pump thermostats have special lights. If the service light continues to blink after one hour of normal operation, you should also talk to a service technician to determine if a service call is needed.
3. Compare the temperature on the thermostat with the

Refrigerators

	1980-89	1990-94	1995-2001	2002 - Present
Large 19-25 cubic feet	$13.88	$10.20	$7.50	$5.40
Medium 15-18 cubic feet	11.93	8.77	6.45	4.64
Small 10-14 cubic feet	11.10	8.16	6.00	4.32

Freezers

	1975	1985	1995	2005 - Present
Chest, manual	$10.60	$7.40	$5.20	$3.65
Upright, manual	12.15	9.20	6.95	5.25
Upright, frost-free	18.25	13.30	9.70	7.10
Compact				3.10

• Choose the best cooking method

Several different cooking methods can be used to prepare meals in your kitchen. These methods can affect the flavor and texture of the food, as well as the time you spend to prepare it. You should also consider at what temperature you wish to cook the food, how much energy you want to use, and the cost for this energy.

Here are some tips to consider when preparing meals.

• Instead of using your full-size oven for cooking small dishes, consider using a crockpot, toaster oven, or microwave.

• For stove-top cooking, use the smallest pan you can to do the job. Try to match the pan size to the burner size.

• Cook with lids on your pots or pans whenever your recipe allows. Without lids, heat escapes, and you can use up to three times as much energy.

• To reduce cooking time, defrost foods ahead of time in the refrigerator. Avoid opening the refrigerator door as much as possible.

• Begin cooking on highest heat, then lower or turn power off to finish cooking on retained heat.

• Preheat the oven no longer than necessary. It is not necessary to preheat for long-baking, roasting, or broiling foods.

In the chart below, you can see the potential savings associated with different cooking methods.

Energy Costs of Cooking a Casserole

Appliance	Temp.	Time	Energy	Cost
Electric oven	350°	1 hour	2.0 kWh	24 cents
Convection oven	325°	45 min.	1.4 kWh	17 cents
Toaster oven	425°	50 min.	.95 kWh	11 cents
Frying pan	420°	1 hour	0.9 kWh	11 cents
Crockpot	200°	7 hours	0.7 kWh	8 cents
Microwave	"high"	15 min.	.36 kWh	4 cents

• Save on water heating

Water Heating Costs

Number of People	Gallons per month	Water Temperature				
		120°	130°	140°	150°	160°
1	600	$12	$14	$17	$19	$21
2	1,080	22	26	30	34	37
4	1,950	43	50	57	64	71
6	3,000	63	73	84	94	105

Next to heating and cooling, water heating is typically the largest energy user in the home. Water heating costs depend upon two factors—the size of your family and the water temperature (thermostat setting). The table above shows that water heating for four people can range from $43 to $71 a month.

costs every month until the coil is chemically cleaned.

• Do not block or shut off more than 10 percent of the air supply registers. Insufficient air flow can cause a heat pump to run longer and harder.

If you normally keep your thermostat set at 68°, then nudge it higher, you'll see the following jumps in your heating costs:

Move setting to:	See costs go up:
72°	21%
74°	32%
76°	44%
78°	57%

•Try to keep the thermostat set at 68°. Higher settings will increase costs, as you can see in the box at left. Also, eliminate large changes in the thermostat setting. On most thermostats, when the temperature is increased by 1.5° to 2°, supplemental resistance heaters will come on as well as the heat pump. Large changes in the thermostat settings can increase electric bills.

• Troubleshoot your heat pump

You may not be aware that your heat pump is not performing properly, resulting in large increases in your electric bill. But if you observe any of the following problems and take action, you could reduce your electric bill or save on the cost of a service call.

Problem:

Your heat pump fails to operate—the outdoor fan is not running.

Solution:

1. Wait 15 minutes. The heat pump may be in defrost. During defrost, the outdoor fan is off to speed up the defrost process.
2. Check for a blown fuse or a tripped circuit breaker in the main power box or service panel.
3. Check that the heat pump disconnect switches are on. These switches are located next to the outdoor unit.

3 Heating and Cooling

Heating costs are usually the biggest part of your energy bill. For every dollar spent on air conditioning, three dollars will be spent on electric heat. Although there are many factors affecting heating energy use, you can keep winter bills as low as possible by following manufacturer recommendations and identifying early signs of equipment trouble.

• Get the most from your heat pump

The cost of heating your home with an air-source heat pump is 50 percent lower than the cost of heating your home with electric baseboard heat or an electric furnace. A measure for comparing heat pump heating efficiency is the heating season performance factor (HSPF). This is a ratio of the estimated seasonal heating output (BTUs) to the seasonal power consumption (watts). The higher the HSPF, the lower the heating costs. For every increase of 1 in HSPF, annual costs decrease by about $100.

Air-Source Heat Pumps
Annual Operating Cost

Size in Tons	Heating Season Performance Factor (HSPF)			
	6	7	8	9
1.5	$580	$470	$355	$240
2.0	755	640	525	410
2.5	925	810	700	585
3.0	1100	985	870	755
3.5	1270	1155	1040	925
4.0	1440	1325	1215	1100
5.0	1785	1670	1560	1445

As the table at the right shows, average winter heating bills could range from $240 to over $1,785, depending on the size and efficiency of your heat pump.

You can minimize operating costs with the following tips:

• Check air filters once a month. If the filter is completely clogged, the air flow will eventually bend it, allowing dirty air to bypass into the indoor coil. A dirty indoor coil will affect operating

You can save on hot water costs in your home by following a few simple suggestions:

1. Lower the water heater temperature. Water heated to between 120° and 125° is hot enough for most households. This is about midway between the "low" and "medium" settings on most water heaters. If you have a dishwasher without a booster heater, you should probably keep the water temperature at 140° (the medium setting).

2. Conserve water. Low-flow shower heads and faucet aerators can cut hot water use in half. Limiting shower time could also reduce hot water costs. Every 5 minutes of a daily shower costs $6 to $12 a month.

3. Insulate your water heater. An insulating jacket may pay for itself through energy savings in less than a year. The older the water heater, the greater the potential savings. Always follow the manufacturer's instructions given in your owner's manual. (Water heater jackets are not recommended for all models.)

4. Install a timer. A simple timer that shuts the water heater off 12 hours a day may pay for itself in three to four years. Savings are greater for water heaters located in unheated garages and basements.

Examine the table below and select those water heater changes with the greatest savings for you.

Energy Saving Actions Add Up

Action taken-- Changes to water heater	Monthly savings per family size			
	1	2	4	6
Setback from 160° to 125°	$8	$13	$25	$37
Setback from 140° to 125°	4	6	11	16
Setback from 130° to 125°	—	2	4	5
Low-flow shower head, 140°	4	8	13	20
Low-flow shower head, 125°	4	6	9	17
Tank insulation, 160°	6	6	6	6
Tank insulation, 125°	4	4	4	4
Clock/timer, 12 hours off	4	4	4	4

• Handle laundry chores the smart way

Doing laundry in your electric washing machine is a regular energy user. You can control the kWh you use and the money you spend for electricity by adjusting the wash/rinse temperature settings on your washing machine. Following are some energy-saving tips about your laundry usage.

• About 90 percent of the energy used in operating a washing machine is used for heating the water. You can determine for yourself whether or not the lower temperature wash settings give you the cleaning results you need. But remember, cold water is just as effective for rinsing as warm water.

• Try to load your washing machine to capacity. When you don't have a full load, adjust the water level to the size of the load.

• With low water temperatures, a liquid detergent is recommended. Powder detergents may not dissolve completely.

• Pretreat heavily soiled or stained clothes to avoid extra washes.

• Use the proper amount of detergent suited for the load size. This will help you avoid extra rinses.

It's easy to take electricity for granted when doing everyday tasks. But when you want to control your electric bill, it's wise to be aware of the impact various appliance use habits have on your bill.

A little common sense can take you and your family a long way when regulating your basic household appliance usage. Contact UCNSB for assistance in estimating your energy usage.

Cost of Washing a Load of Laundry

	120°		140°	
wash/rinse settings	kWh used	avg. cost per load (cents)	kWh used	avg. cost per load (cents)
hot/hot	6.5	78	8.3	100
hot/warm	4.9	59	6.3	76
hot/cold	4.3	52	5.3	64
warm/warm	3.4	41	4.3	52
warm/cold	1.9	23	2.3	28
cold/cold	0.4	5	0.4	5