ENERGY guide

As the cost of energy rises, consumers are seeking ways to use energy more efficiently. It takes a lot of electricity to power the farms that feed families across America. With the electricity demands of agriculture and a home, farms rely heavily on their electric cooperative.

The first step to using energy more wisely is understanding your energy use. This guide will present information and practices that will help you be better informed about your electricity consumption and help you make smart decisions about energy.

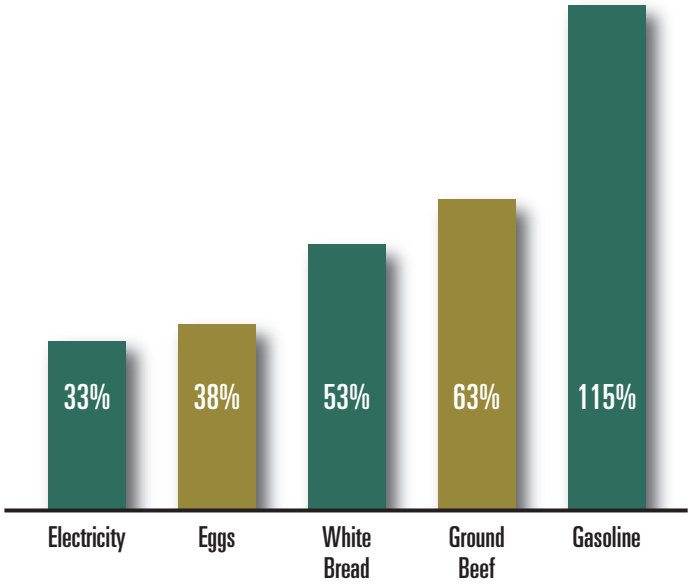
ENERGY® wise

Fueling your farm

Whether you're drying crops, milking cattle, farrowing hogs or operating an anaerobic digester, your farm benefits from the service provided by your electric cooperative. Your co-op provides reliable, affordable and abundant electricity that meets all of your farm's needs. Among the most important benefits to farmers is the relatively stable price of electricity over time.

Power continues to be a bargain, especially when compared to other consumer goods. The chart below shows how the cost of electricity has changed compared to other consumer products.

Price increases since 1996



Source: U.S. Bureau of Labor Statistics; U.S. Energy Information Administration

Using your meter

Your meter is a highly accurate tool. If used properly, it gives you the most precise picture of your electricity use. The most important thing to remember is to read your meter on the same day of each month. If you check your meter every 30 days, you'll be able to monitor your use more accurately.

We're here to help

Once you've got a clear picture of your electricity use, your co-op is willing to do whatever it takes to help make your farm as energy efficient as possible. Ask the energy experts at your local cooperative what they can do to help you get the most from your energy dollar.

Monitor your use and cost

The most effective way to measure your electricity use is to use your meter and keep an accurate record. Take a few minutes each day (preferably at the same time) to jot down your electric meter reading. Start the first day of the month.

By subtracting the previous day's reading from the current reading, you'll get the number of kilowatt-hours (kWh) 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.

Monitoring your kWh is a vital first step to understanding your electricity use. Understanding your electricity use is the first step to becoming more efficient at home.

DAILY READING	kWh USED DAILY	RECORD OF DAILY ACTIVITIES THAT AFFECTED 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		

Energy use chart

Home Electricity Costs

APPLIANCE	TYPICAL ENERGY USAGE	AVERAGE MONTHLY COST AT 11.5¢/kWh	ESTIMATED MONTHLY COST
Refrigerator With Top Freezer	34-183 kWh/mo	$3.91-$21.05	
Freezer	34-62 kWh/mo	$3.91-$7.13	
Dishwasher	20-40 kWh/mo	$2.30-$4.60	
Oven	45 kWh/mo	$5.18	
Range Top	37 kWh/mo	$4.26	
Microwave Oven	17 kWh/mo	$1.96	
Clothes Washer	39 kWh/mo	$4.49	
ENERGY STAR® Clothes Washer	17 kWh/mo	$1.96	
Clothes Dryer	83 kWh/mo	$9.55	
Electric Water Heater (Family of 4)	400 kWh/mo	$46.00	
Dehumidifier	81-690 kWh/mo	$9.32-$79.35	
Air Cleaner	60-120 kWh/mo	$6.90-$13.80	
Furnace Fan	33-560 kWh/mo	$3.80-$64.40	
Ceiling Fan	7 kWh/mo	$0.81	
Portable Heater (1,500 Watts)	22-540 kWh/mo	$2.53-62.10	
Well Pump	7-108 kWh/mo	$0.81-$12.42	
13-Watt Compact Fluorescent Lamp	2.3 kWh/mo	$0.26	
100-Watt Incandescent Lamp	6 kWh/mo	$0.69	
Halogen Torchiere Lamp	54 kWh/mo	$6.21	
22-inch LCD TV (720P)	3-22 kWh/mo	$0.35-$2.53	
42-inch Plasma TV (1080P)	29-233 kWh/mo	$3.34-$26.80	
27-inch Analog TV	7-54 kWh/mo	$0.80-$6.21	
53-inch Analog Projection TV	10-82 kWh/mo	$1.15-$9.43	
DVD Player/VCR	7 kWh/mo	$0.81	
Desktop Computer and Monitor	22-60 kWh/mo	$2.53-$6.90	
Laptop Computer	7-40 kWh/mo	$0.81-$4.60	
Stereo System	10 kWh/mo	$1.15	
Cellular Phone	0.5 kWh/mo	$0.06	
Standby Power	42 kWh/mo	$4.83	
		Total cost	

Seasonal Home Electricity Costs

APPLIANCE	AVERAGE SEASONAL COST AT 11.5¢/kWh			
Central Air Conditioners **SEER**	**7**	**10**	**13**	**16**
3 Ton w/o Programmable Thermostat	$245	$171	$132	$107
3 Ton with Programmable Thermostat	$206	$144	$111	$90
5 Ton w/o Programmable Thermostat	$408	$286	$220	$179
5 Ton with Programmable Thermostat	$343	$240	$185	$150
Room air conditioning **EER**	**7**	**9**	**11**	**13**
5,000 Btuh	$34	$26	$22	$18
8,000 Btuh	$54	$42	$35	$29
12,000 Btuh	$82	$63	$52	$44

SEER = Seasonal Energy Efficiency Ratio. Higher SEER means more energy efficient.
EER = Energy Efficiency Ratio. Higher EER means more energy efficient.
Calculations based on 414 cooling hours, the average annual cooling load in St. Cloud, Minn., according to ENERGY STAR.

Farm Electricity Costs

EQUIPMENT	ENERGY CONSUMPTION	ESTIMATED MONTHLY kWh
Aeration Fan	(HP x 0.746) x hours of use	
Air Compressor	(HP x 0.746) x hours of use	
Barn Cleaner (2-5 HP)	25-40 kWh per month	
Barn Lighting	60 kWh per month	
Clipper	1 kWh per hour	
Dairy Water Heater	1 kWh per 10 hours	
Block Engine Heater (1-2 kW)	1-2 kWh per hour	
Fence	7 kWh per month	
Electric Motor	(HP x 0.746) x hours of use	
Grain Dryer (No Heat)	1 kWh per bushel	
Grain Dryer (w/ Electric Heat)	2 kWh per bushel	
Grain Elevator	4 kWh per 1,000 bushels	
Grain Grinder	1 kWh per 500 pounds	
Incubator	1 kWh per 25 eggs	
Milking Machine (Portable)	2 kWh per cow per month	
Livestock Fan (1/2 HP)	0.5 kWh per hour	
Milking Machine (Pipeline)	5 kWh per cow per month	
Milk Cooler (Bulk)	1 kWh per 100 pounds	
Pet Water Heater	30-50 kWh per month	
Poultry House Lighting	6 kWh per 100 birds per month	
Poultry Water Warmer	1 kWh per day	
Silo Unloader (Grass)	4 kWh per ton	
Silo Unloader (Corn)	2.5 kWh per ton	
Tool Grinder	0.5 kWh per hour	
Water Pump (Deep Well)	1.5 kWh per 1,000 gallons	
Water Pump (Shallow Well)	1 kWh per 1,000 gallons	
Water Stock Tank Heater	50-500 kWh per month	
Welder	9 kWh per month	
Yard Lighting (Dusk to Dawn)		
175-Watt Mercury Vapor	73 kWh per month	
250-Watt Mercury Vapor	105 kWh per month	
400-Watt Mercury Vapor	161 kWh per month	
	Farm total kWh	

These figures present a range of typical use based on the average use of an appliance in good working condition. Actual use will vary based on patterns of use, age and condition of equipment. $0.115/kWh was the approximate average price of residential electricity in May 2010 according to the U.S. Energy Information Administration. Cost estimates do not include taxes and other charges. Refer to your electric bill for actual electric rates.

Fan and motor energy use

The horsepower (HP) and duration of use of a fan or motor determines the electricity consumption. Use the formula below to better understand how much electricity is consumed.

(HP of motor or fan x 0.746) x hours of use = kWh

Estimating electricity use and cost

Appliance and equipment wattage and operating costs can vary greatly. The following information will show you how to determine where your electricity 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 kWh. Average kWh cost = $ amount of electric bill divided by kWh used.

EXAMPLE: $115 ÷ 1,000 kWh = **11.5¢ per kWh**

Step 2

Since the wattage of an appliance determines the electrical use per hour, the second step is to determine the wattage of the appliances of concern. 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 amps, rather than watts. If so, multiply volts times amps to determine the wattage.

EXAMPLE: 120 volts x 12.1 amps = **1,452 watts**

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?

EXAMPLE: kWh used = (100 watts x 15 hours) ÷ 1,000 watts = 1.5 kWh
Your cost = 1.5 kWh x 11.5¢ = 17.25¢

1,000 watt-hours equals 1 kilowatt-hour.

Step 4

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

EXAMPLE: $115 ÷ 30 days = **$3.83 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: $3.83 ÷ 4 people = **96¢ per person per day**

Factors that affect energy use

Season

Electric bills will typically jump in the summer due to air conditioner use. You may see similar increases in the winter if you heat with electricity. Your bill can also vary due to equipment that is only used during specific times of year, such as crop dryers and engine block heaters.

'Phantom' load

When you turn something off, that doesn't necessarily mean that it has stopped using electricity. Many electronics have a standby mode that draws an electric current even while turned off. Known as "phantom" loads, they can add up quickly. In fact, the average home wastes 42 kWh each month due to phantom loads – that adds up to nearly $50 per year. Unplug all electronics that display a clock or light while turned off, or use a smart power strip to limit phantom loads.

Vacation

When 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. If you've ever wondered how an empty house can use so much energy, answer the following questions:

- **Was the water heater turned down or off during your vacation?** Remember, 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.
- **Did other appliances keep running while you were on vacation?** Clocks, cell phone chargers, DVD players, heating and air conditioning equipment, computers, fax machines and TV sets may draw some "phantom" electricity.

Vintage

Older electronics often draw more current than newer models (televisions are the most common exception). While it can be difficult to invest in a new appliance when you've got a reliable older model, the cost savings from energy can, in some cases, recoup the cost of an upgrade.

Get inside the outlet

The table on pages 4 and 5 will give you an estimate of your electricity use, and your meter is great for accurately measuring consumption for your entire home, but there are tools that can help identify those items that are particularly costly to operate.

A portable electric monitor fits between an appliance and the outlet to measure electricity use and cost. By isolating an individual device, you can watch how your habits affect your power bill.

Contact your co-op to find out how to get a portable electric monitor and to learn about other tools available to give you a clearer picture of your electricity use.

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

www.mnbrighterideas.com
www.greatriverenergy.com
www.togetherwesave.com
www.energystar.gov
www.commerce.state.mn.us
www.aceee.org
www.eere.energy.gov
www.ftc.gov
www.energy.gov

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Your co-op can help

If you are building, renovating or considering an investment in energy efficient equipment, contact your local cooperative. A co-op representative can get you in touch with qualified contractors or vendors, and might offer rebates and discounts to help fund your project.