Energy at Home

Taking a Look at Your Home's Energy Use

South Dakotans and Minnesotans co-op members rank at the top in the nation for the average residential kilowatt hour usage in the country.

In 2006, South Dakota ranked second behind Minnesota's average of 1,399.85 kwh per month per residential member. (In 2002, Minnesotans averaged 1,426 kwh per month and South Dakota ranked fourth with an average of 1,360.80 kwh per month.)

Home energy use has risen throughout the last several decades.

It's hard to imagine life without electricity. In our homes, we rely on it to power our lights, appliances and electronics. Many of us also use electricity to provide our homes with hot water, heat and air conditioning.

But as we use more electricity in our homes, our electric bills rise. Figuring out where your home's energy bill adds up takes a bit of detective work on the part of the homeowner. Each family has unique energy use patterns and habits. Once you know your family's use and habits, you can develop a conservation and energy efficiency plan.

Your Home's Energy Use

The first step to taking a whole house energy efficiency approach is to find out which parts of your house use the most energy. A home energy audit will pinpoint those areas and suggest the most effective measures for cutting your energy costs. You can conduct a simple home energy audit yourself, you can contact your local electric cooperative or use their online energy audit tool available at www.touchstoneenergy.coop or you can call an independent energy auditor for a more comprehensive examination.

Energy Auditing Tips

• Check the insulation levels in your attic, exterior and basement walls, ceilings, floors and crawl spaces.

• Check for holes or cracks around your walls, ceilings, windows, doors, light and plumbing fixtures, switches and electrical outlets that can leak air into or out of your home.

• Check for open fireplace dampers.

• Make sure your appliances and heating and cooling systems are properly maintained. Check your owner's manuals for the recommended maintenance.

• Study your family's lighting needs and use patterns, paying special attention to high-use areas such as the living room, kitchen and outside lighting. Look for ways to use lighting controls – like occupancy sensors, dimmers or timers – to reduce lighting energy use and replace standard (also called incandescent) light bulbs and fixtures with compact or standard fluorescent lamps.

Formulating Your Plan

After you have identified where your home is losing energy, assign priorities by asking yourself a few important questions:

• How much money do you spend on energy?

• Where are your greatest energy losses?

• How long will it take for an investment in energy efficiency to pay for itself in energy cost savings?

• Do the energy saving measures provide additional benefits that are important to you (for example, increased comfort from installing double-paned, efficient windows)?

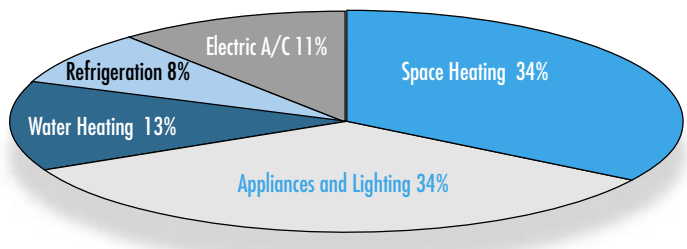
• How long do you plan to own your current home?

• Can you do the job yourself or will you need to hire a contractor?

• What is your budget and how much time do you have to spend on maintenance and repair?

Once you assign priorities to your energy needs, you can form a whole house efficiency plan. Your plan will provide you with a strategy for making smart purchases and home improvements that maximize energy efficiency and save the most money. Another option is to get the advice of a professional. Many utilities conduct energy audits for free or for a small charge. For a fee, a professional contractor will analyze how well your home's energy systems work together and compare the analysis to your utility bills. He or she will use a variety of equipment such as blower doors, infrared cameras and surface thermometers to find leaks and drafts. After gathering information about your home, the contractor or auditor will give you a list of recommendations for cost-effective energy improvements and enhanced comfort and safety. A good contractor will also calculate the return on your investment in high-efficiency equipment compared with standard equipment.

How we use energy in our homes



Heating accounts for the biggest chunk of a typical utility bill.
Source: 2005 Building Energy Data Book, U.S. Department of Energy

Estimating Appliance and Home Electronic Energy Use

If you're trying to decide whether to invest in a more energy-efficient appliance or you'd like to determine your electricity loads, you may want to estimate appliance energy consumption.

Formula for Estimating Energy Consumption

You can use this formula to estimate an appliance's energy use:

Wattage × Hours Used Per Day ÷ 1000 = Daily Kilowatt-hour (kwh) consumption

(1 kilowatt (kw) = 1,000 watts)

Multiply this by the number of days you use the appliance during the year for the annual consumption. You can then calculate the annual cost to run an appliance by multiplying the kwh per year by your local utility's rate per kwh consumed.

To estimate the number of hours that a refrigerator actually operates at its maximum wattage, divide the total time the refrigerator is plugged in by three. Refrigerators, although turned "on" all the time, actually cycle on and off as needed to maintain interior temperatures.

Examples:

Window fan:
(200 watts × 4 hours/day × 120 days/year) ÷ 1000 = 96 kwh × 8.5 cents/kwh = $8.16/year

Personal Computer and Monitor:
(120 + 150 Watts × 4 hours/day × 365 days/year) ÷ 1000 = 394 kwh
394 kwh × 8.5 cents/kwh = $33.51/year

Wattage

You can usually find the wattage of most appliances stamped on the bottom or back of the appliance or on its nameplate. The wattage listed is the maximum power drawn by the appliance. Since many appliances have a range of settings (for example, the volume on a radio), the actual amount of power consumed depends on the setting used at any one time.

If the wattage is not listed on the appliance, you can still estimate it by finding the current draw (in amperes) and multiplying that by the voltage used by the appliance. Most appliances in the United States use 120 volts. Larger appliances, such as clothes dryers and electric cooktops, use 240 volts. The amperes might be stamped on the unit in place of the wattage. If not, find a clamp-on ammeter – an electrician's tool that clamps around one of the two wires on the appliance – to measure the current flowing through it. You can obtain this type of ammeter in stores that sell electrical and electronic equipment. Take a reading while the device is running; this is the actual amount of current being used at that instant.

When measuring the current drawn by a motor, note that the meter will show about three times more current in the first second that the motor starts than when it is running smoothly.

Many appliances continue to draw a small amount of power when they are switched "off." These "phantom loads" occur in most appliances that use electricity, such as VCRs, televisions, stereos, computers and kitchen appliances. Most phantom loads will increase the appliance's energy consumption a few watt-hours. These loads can be avoided by unplugging the appliance or using a power strip and using the switch on the power strip to cut all power to the appliance.

Many cooperatives offer for rent or loan the use of a Kill-A-Watt meter which allows homeowners to simply plug a device into a meter and determine how much electricity is being used. A LCD display measures electric consumption by the kilowatt-hour. You can calculate your electrical expenses by the day, week, month, even an entire year.

Typical Wattages of Various Appliances

Here are some examples of the range of nameplate wattages for various household appliances:

- Aquarium = 50 to 1,210 Watts
- Clock radio = 10
- Coffee maker = 900 to 1,200
- Clothes washer = 350 to 500
- Clothes dryer = 1,800 to 5,000
- Dishwasher = 1,200 to 2,400 (using the drying feature greatly increases energy consumption)
- Dehumidifier = 785
- Electric blanket- Single/Double = 60/100
- Fans:
  - Ceiling = 65 to 175
  - Window = 55 to 250
  - Furnace = 750
  - Whole house = 240 to 750
- Hair dryer = 1,200 to 1,875
- Heater (portable) = 750 to 1,500
- Clothes iron = 1,000 to 1,800
- Microwave oven = 750 to 1,100
- Personal computer
  - CPU – awake/asleep = 120/30 or less
  - Monitor – awake/asleep = 150/30 or less
  - Laptop = 50
- Radio (stereo) = 70 to 400
- Refrigerator (frost-free, 16 cubic feet) = 725
- Televisions (color)
  - 19″ = 65 to 110
  - 27″ = 113
  - 36″ = 133
  - 53″-61″ Projection = 170
  - Flat screen = 120
- Toaster = 800 to 1,400
- Toaster oven = 1,225
- VCR/DVD = 17 to 21 / 20–25
- Vacuum cleaner = 1,000 to 1,440
- Water heater (40 gallon) = 4,500 to 5,500
- Water pump (deep well) = 250 to 1100
- Water bed (with heater, no cover) = 120–380