

Homeowners' guide to energy savings

Money-saving tips for every budget



ON

for conservation

OTTER TAIL
POWER COMPANY

So which is it?

The best things in life are free.

You've got to spend money to make money.

When it comes to saving energy, the correct answer is *both*.

Most of us are trying to cut our energy consumption because it's good for the budget and it's good for the environment. Implementing no-cost changes and developing good habits can help you conserve energy.

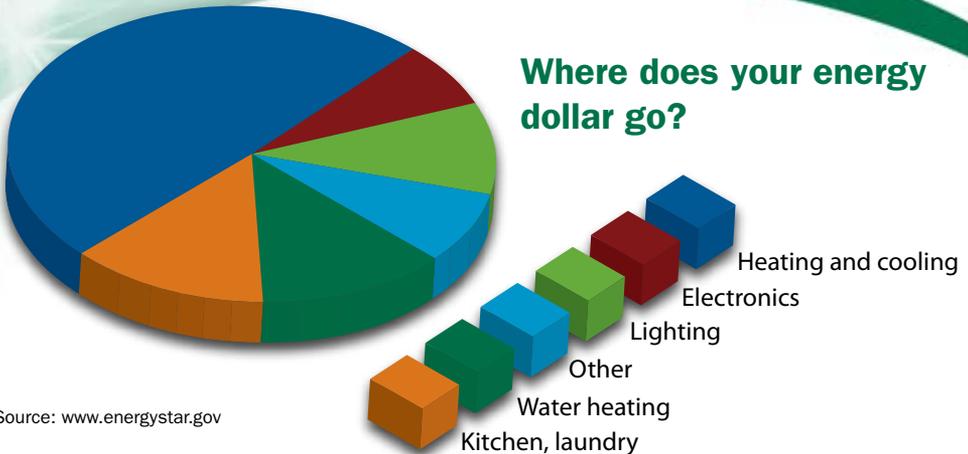
Once you've adopted energy-saving habits, you may wonder if you could *do more* and *save more*.

The answer is yes!

A few dollars and a little sweat equity invested in energy-saving projects, such as weatherizing, have an almost immediate payoff. Bigger investments—like replacing inefficient furnaces or windows—can save hundreds of dollars each year when done properly.

What you do and where you start is up to you. But one thing is certain: Every effort you make to conserve energy can pay off in a lower energy bill for you and conserve resources for everyone.

Where does your energy dollar go?



Source: www.energystar.gov

In 2005 the typical American family spent \$1,900 a year on utility bills. That amount is even higher now, and prices continue to rise. Through energy-saving products and practices, you can minimize the impact that cost increases have on you and your family.

No-cost habits that save

Maybe your family already has good energy-conservation habits. But if you think you can do better, look over this checklist for no-cost ways to save.

- ❑ Remember the magic numbers: 68 and 72. Set your home thermostats at 68 degrees or lower in winter; 72 degrees or higher in summer. For every degree you set your thermostat below or above these target temperatures—depending on the season—you'll save about 3 percent on your utility bill.
- ❑ Dial down the thermostat when nobody's home and close heating vents in seldom-used rooms.
- ❑ Keep furniture and drapes from blocking heat sources.

Save by shutting

- ❑ Shut drapes or blinds in summer; open them during daylight hours in winter.
- ❑ Shut fireplace or wood stove dampers when not in use.
- ❑ Shut off bath and kitchen exhaust fans when their jobs are done.
- ❑ Shut off faucets. Running hot water when you don't need it wastes two to three gallons a minute.
- ❑ Shut off extra lights. Focus light only where it's needed, like kitchen counters, computer desks, and workbenches.
- ❑ Shut off TVs, stereos, and appliances, and unplug chargers when not in use.
- ❑ Shut off the water heater and water softener if you plan to be gone for more than three days.



Beware the greedy entertainment center

Using a big-screen TV, video games, DVRs, and TVs in multiple rooms can add up to 10 percent to your electric bill. That's as

much as keeping 12 laptop computers plugged in and running for a year!

To diminish those phantom loads, plug all electronics into the same power strip. Turn off the electronics, then turn off the power strip.

Do chores that pay

- ❑ Keep radiators, air registers, and baseboard heaters free of dust.
- ❑ Remove debris from heat pump and air conditioner compressors by gently spraying them with water once a month when weather permits.
- ❑ Defrost refrigerators and freezers when the frost is about a quarter of an inch thick.
- ❑ Clean the clothes dryer lint filter after every load, periodically scrub residue from the filter screen, and check to be sure the vent is clear.

Practice water wisdom

- ❑ Lower your water-heater thermostat to 120° F.
- ❑ Take a shower instead of a bath. A bath takes about twice as much hot water as a five-minute shower.
- ❑ Wash only full loads in the clothes washer and dishwasher.
- ❑ Wash clothes in cold water with cold-water detergents as often as possible.

Get smart in kitchen, laundry room

- ❑ Use the smallest pan needed, put a lid on it, place it on the right sized burner, and turn the heat down when its content begins to boil.
- ❑ Use your microwave or slow cooker instead of your stove.
- ❑ Skip preheating your oven unless you're baking breads or pastries.
- ❑ Set your refrigerator thermostats to an appropriate temperature. Recommendations are 37° F. to 40° F. for the refrigerator; 5° F. for the freezer.
- ❑ Keep refrigerators and freezers full but not packed.
- ❑ Let dishes dry on their own rather than using the heat-dry cycle on your dishwasher.
- ❑ Use the automatic moisture sensor on your clothes dryer if it has one.

Save \$

According to the U.S. Department of Energy, a family of four, each showering for five minutes a day, uses 700 gallons of water a week. Cut that amount in half by using low-flow showerheads.



Invest a little, gain a lot

These energy-saving measures will cost you a little money but won't break the budget, and you'll save in the long run.

Spend \$1 on weatherizing; save \$2.20

According to the U.S. Department of Energy, the value of weatherization improvements to your home is 2.2 times greater, on average, than the cost of the improvements themselves.

For great how-to help, download the *Do-It-Yourself Guide to Energy Star Home Sealing* on www.otpco.com.

On a really tight budget? Many Community Action agencies offer home weatherization assistance for people with lower incomes.

Seal the leaks

Air leaks are the biggest energy wasters in the home. The good news is it doesn't cost much to seal them. Caulk, weather strip, and/or insulate around:

- Entrance doors.
- Electrical outlets and switch plates on exterior walls.
- Bathroom and kitchen exhaust fans.
- Exterior hose connections, such as dryer exhausts.
- The areas where ductwork, electrical wiring, or plumbing extends through floors, ceilings, or exterior walls.
- Warm-air registers and water-heater and furnace flues.
- New and replacement windows. Replace cracked caulk on existing windows.

Do you have air leaks in your house?

Caulk is best for cracks and gaps less than 1/4 inch wide. Insulation, including expandable foam, rigid foam, and fiberglass batting, may be used for ceilings, walls, and floors over unconditioned crawl spaces.



Pamper your furnace

- ❑ Schedule regular maintenance on heating and cooling systems for top efficiency and equipment longevity.
- ❑ Insulate ducts that pass through unconditioned spaces.
- ❑ Clean or replace furnace filters monthly.
- ❑ Zone your heating system and lower temperatures in seldom-used rooms.

Use efficient lighting

- ❑ Replace incandescent lightbulbs with compact fluorescent lamps. CFLs use 75 percent less electricity.
- ❑ Install motion sensors that automatically turn on lights when a room is entered and off when it's vacated.
- ❑ Use LED decorative lights to save 90 percent on your holiday lighting costs.
- ❑ Place your outdoor lights on photoelectric control or use an automatic timer.

Treat hot water like it's worth something

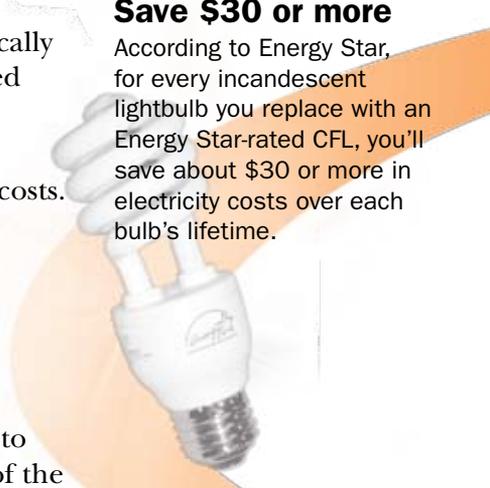
- ❑ Insulate older electric water heaters to prevent heat loss through the walls of the tanks. Follow installation instructions.
- ❑ Insulate long runs of hot-water supply pipe, especially sections in unheated areas.
- ❑ Install low-flow faucets and showerheads.
- ❑ Repair leaky faucets (and toilets) promptly.

Save 70%

Geothermal heat pumps are ranked by the EPA as the most energy-efficient systems for heating and cooling. You'll save 70% on heating and cooling costs.

Save \$30 or more

According to Energy Star, for every incandescent lightbulb you replace with an Energy Star-rated CFL, you'll save about \$30 or more in electricity costs over each bulb's lifetime.



Save \$200 on a water heater

Replacing an inefficient or worn-out water heater may seem costly, but you'll save money down the road. Plus, if you install a 90 percent efficient water heater on one of Otter Tail Power Company's controlled-service rates, you may qualify for a rebate. Call our **Idea Center** at **800-493-3299** for more information.

Shop smart

New appliances aren't cheap, but your old ones may be costing you more than you think. For instance, a 1990s-era refrigerator could cost up to 50 percent more to operate than a new Energy Star model.

When you shop, look for the Energy Star logo and compare EnergyGuide labels.

EnergyGuide labels include:

- Estimates of how much energy appliances use.
- Comparisons with energy use of similar models.
- Approximate annual operating costs.

What is Energy Star?

Energy Star is a program of the U.S. Environmental Protection Agency and Department of Energy. Energy Star appliances exceed the efficiency levels required by current federal standards.

www.energystar.gov



How much does it cost to run typical home appliances?

The appliances chart on the following page shows the average operating costs for many typical home appliances.

Costs are based on an average residential service rate of \$0.0757 a kilowatt-hour, an average off-peak water-heating rate of \$0.053, and an off-peak rate of \$0.03625 a kilowatt-hour. While your actual price may vary, this chart gives you a good idea of what the cost ranges might be.

Want more information about appliances?

Look up operating costs of more than 50 common appliances at www.otpc.com.

To figure out operating costs on your own, use the formula on page 13.

Operation and cost per cooling season							
Appliances	Approx. average wattage	Low hours of use	High hours of use	Low kwh	High kwh	Low cost	High cost
Air conditioner							
room 6,000 Btu	750	120	720	90	540	6.81	40.88
room 9,000 Btu	1050	120	720	126	756	9.54	57.23
central 8.5 SEER 2.5 tons)	3500	240	860	840	3010	63.59	227.86
Air-source heat pump							
(12 SEER 2.5 tons) off-peak	3500	240	860	840	3010	30.45	109.11

Operation and costs per month							
Appliances	Approx. average wattage	Low hours of use	High hours of use	Low kwh	High kwh	Low cost	High cost
Clothes dryer	5000	6	28	30	140	2.27	10.60
Clothes dryer off-peak	5000	6	28	30	140	1.09	5.08
Clothes washer	600	7	40	4	24	0.32	1.82
Coffeemaker	850	4	30	3	25.5	0.26	1.93
Computer with monitor and printer	200	25	160	5	32	0.38	2.42
Dishwasher	1200	8	40	10	48	0.73	3.63
DVD player	40	50	200	2	8	0.15	0.61
Freezer (15 cubic feet)	335	180	420	60	141	4.56	10.65
Microwave	1500	5	30	8	45	0.57	3.41
Range							
oven	3500	10	50	35	175	2.65	13.25
small element	1200	10	50	12	60	0.91	4.54
large element	2300	10	50	23	115	1.74	8.71
Refrigerator-freezer							
frost-free 16 -18 cu. ft.	400	150	300	60	120	4.54	9.08
side by side	780	190	300	148	234	11.22	17.71
Television							
CRT 27"	170	60	440	10	75	0.77	5.66
LCD 32"	125	60	440	8	55	0.57	4.16
VCR	40	50	200	2	8	0.15	0.61
Video Game (X-box)	100	15	75	2	8	0.11	0.57
Water heater on the off-peak water heating rate of \$.053							
family of 4 off peak	4500	90	138	405	621	21.47	32.91
family of 2 off peak	4500	66	92	297	414	15.74	21.94
Water heater on off-peak rate of \$.03625							
family of 4 off peak	4500	90	138	405	621	14.68	22.51
family of 2 off peak	4500	66	92	297	414	10.77	15.01

Big improvements = big savings

There's no doubt weatherizing, replacing old windows and doors, and installing up-to-date electric heating systems will save you money. How much money? Barb, one of Otter Tail Power Company's customers in Jamestown, North Dakota, is saving almost \$700 a year on her heating bill after winning one of our \$7,500 Home Energy Makeovers.

The makeover included:

- A new off-peak electric heating system.
- Additional insulation, weather stripping, and caulking.
- New Energy Star windows and a solid-core exterior door.

How much difference did the weatherizing make? It cut the air leakage in Barb's home almost in half, from 2,150 to 1,100 cubic feet per minute based on a blower door test.

And Barb's not alone. We're seeing other customers in our service area who are saving up to \$800 on their annual heating bills after taking similar actions.

Do your homework before you start

Before launching into any major home-improvement project, it's vital to pinpoint problems, make a plan, and develop a budget.

Start your research online

□ Visit www.otpc.com to:

- Evaluate your home's energy use with a free online home energy audit.
- Run your own cost comparison before changing heating or water-heating systems.
- Download the *Do-It-Yourself Guide to Energy Star Home Sealing* to learn how to find air leaks and seal them from basement to attic.

□ Check out www.ConservingElectricity.com for energy-saving tips and guides for home and business.

- **Saving energy at home**—Browse through nine different links designed to help you save energy and money.
- **Businesses make saving energy profitable** – Learn about conservation programs specifically designed for businesses.

Ask the experts

- ❑ Hire an expert to perform a home energy audit and blower door test on your home. Then make the repairs or changes identified by the audit. Blower door testing measures air infiltration into a home under a constant depressurization level.
- ❑ Get efficiency-improvement cost estimates from building materials suppliers and contractors.
- ❑ Call the Otter Tail Power Company Idea Center at 800-493-3299 for information about electric technologies, operating costs, rebates, and financing for electric applications.

Take action as needed

Follow insulation recommendations. Insulation levels are specified by R-value. The higher the R-value of a material, the greater its insulating properties and the slower heat flows through it.

- ❑ Seal air leaks into your attic and add insulation. Add roof vents to prevent condensation and formation of damaging ice dams.
- ❑ Seal spaces between floor joists and behind knee walls with extruded or sprayed foam insulation.
- ❑ Insulate the interior of foundation walls with extruded polystyrene.
- ❑ Replace worn, broken, improperly fitting windows with Energy Star designs.
- ❑ Replace leaky basement windows with insulated-glass windows.
- ❑ Install energy-efficient exterior doors and storm doors.



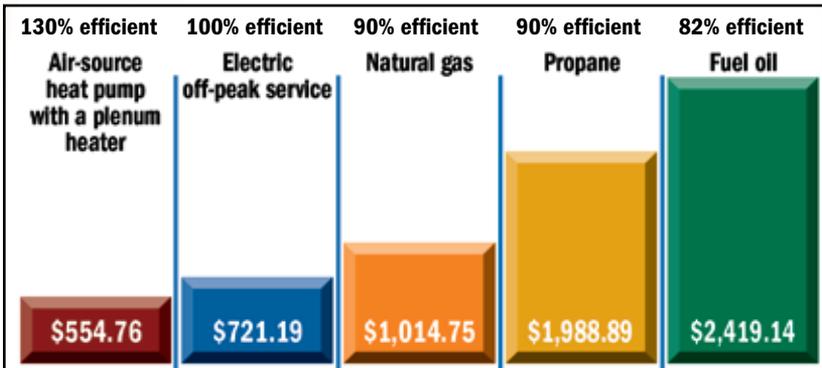
Compare and save

- Find out how your current heating fuel stacks up to electricity with the fuel comparison tables found at www.otpc.com.
- Consider manageable off-peak electricity, and your pocketbook will benefit in more ways than one.
 - Electric heating systems convert 100 percent of the energy they use into heat. Even when they're new, gas and propane furnaces top out at about 92 percent efficiency, heating oil at about 85 percent; and with older models, efficiency may drop as low as 60 percent.
 - As costs of natural gas, propane, and heating oil continue to rise, off-peak electricity remains a good deal.
 - Electric water heaters are up to 94 percent efficient. Standard fossil fuel water heaters are only about 60 percent energy efficient.

Save with rebates

Install a thermal-storage heating system and you may be eligible for a generous rebate. Qualifying projects include thermal-storage central furnaces or room units, underfloor cable or panel systems, and electric boilers for hydronic underfloor heating systems that are placed on a qualified rate. Learn more at www.otpc.com.

Let's take a look at the costs of heating a 20-year-old 2,000 square-foot home with electricity compared with fossil fuel.



Annual heating costs based on the DOE, EIA 2008/2009 forecast of \$13.45/mcf natural gas, \$2.42/gallon propane, and \$4.09/gallon fuel oil and an off-peak rate of \$.03625/kwh.

Heat pumps make sense

- ❑ **Save 30 percent more electricity with an air-source heat pump**
In warm weather air-source heat pumps serve as air conditioners; in winter they collect heat from outside air to warm your home. In northern climates a supplemental heat source is required for comfort during extreme cold. The combination can save up to 30 percent over conventional 100 percent efficient electric heat.
- ❑ **Go geothermal for more than 300 percent efficiency**
Geothermal, or ground-source, heat pumps are the most energy-efficient heating and cooling systems on today's market, delivering more than three units of heat for each unit of energy used.
How it works: A geothermal heat pump warms a building by extracting heat from the earth in winter and cools by transferring heat to the earth in summer.
- ❑ **Take advantage of rebates for Minnesota and South Dakota customers**
Otter Tail Power Company offers rebates and special low-interest loans on air-source and geothermal heat pump systems for qualified Minnesota and South Dakota customers. We offer these incentives through our Minnesota Conservation Improvement Program and our South Dakota Energy Efficiency Plan while funds are available. We are exploring similar programs in North Dakota.

Save \$300

Residential Demand Control customers save an average of \$300 a year on their electric service costs—and many save much more. By permitting control of certain appliances (heating systems, water heaters, etc.), RDC customers are eligible for one of Otter Tail Power Company's discounted electric rates. And that rate applies to all the energy they use in their homes.

With rising energy prices, this is one way to control your energy costs. RDC is best matched with customers who use electric heating. For relatively unnoticeable control during peak periods, customers can combine RDC with thermal-storage electric heating technologies. Learn more at www.otpc.com.

Ready, set, get started

With time, effort, and some financial investment, you can make your home a model of energy efficiency. It's a worthy goal, not just for the monetary rewards, but for the resources you'll help preserve for generations to come.

For more information and inspiration, visit the following web sites:

Otter Tail Power Company

www.otpc.com and www.ConservingElectricity.com

Energy Star

www.energystar.gov

Energy Savers: Tips on Saving Energy and Money at Home

www1.eere.energy.gov/consumer/tips/



Appendix

What's a kilowatt-hour?

Most people know they pay for electricity by the kilowatt-hour (kwh), but few know exactly what a kilowatt-hour is.

Perhaps the easiest explanation is that a 100-watt lightbulb burning for 10 hours uses 1 kilowatt-hour of electricity.

$100 \text{ watts} \times 10 \text{ hours} = 1,000 \text{ watt hours (1 kilowatt-hour)}$

What does a kilowatt-hour of electricity cost?

In 2007 Otter Tail Power Company residential customers paid on average 7.57 cents for a kilowatt-hour of electricity. In the above example, the cost of burning the 100-watt bulb for 10 hours would be 7.57 cents.

Let's take a look at another example. A 250-watt color television would use 1 kilowatt in four hours.

$250 \text{ watts} \times 4 \text{ hours} = 1,000 \text{ watt hours (1 kilowatt-hour)}$

This means that the cost of watching your favorite television programs from 6:30 to 10:30 in the evening would be about 7.57 cents, not including the use of a satellite, cable box, digital video recorder, etc.

How can I determine my costs more exactly?

You'll find the wattage of most appliances stamped on the back or bottom.

1. To determine the kilowatts used per hour, divide the wattage by 1,000.
2. Multiply that number by the number of hours per year you use the appliance.
3. Multiply that answer by your electric rate as stated on your electric service statement.

Example: A dishwasher using 600 watts.

1. $600 \text{ watts} / 1,000 = .6 \text{ kwh per hour}$
2. $.6 \times 500 \text{ hours used} = 300 \text{ kwh per year}$
3. $300 \times .0757 = \$22.71 \text{ per year}$

For estimates on the annual operating costs for many commonly used electric appliances, check out the *Appliance energy use table* on page 7. For a more complete list of appliances visit www.otpc.com. To find the link, click on *Save energy/money* and *Calculate your savings*.



Conserving energy keeps cash in your pocket

With good energy-conservation habits and the help of Energy Star products, in one year alone Americans saved \$16 billion on their utility bills.
\$16 billion. Not bad. Some of it could be yours!



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