

BASELOAD ENERGY USAGE

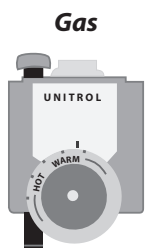
REDUCING WATER-HEATING COSTS

Water heating is a baseload use, therefore its cost doesn't vary much from month to month. In moderate climates, many families spend as much money on water heating as they spend on space heating or air conditioning annually.

Customers can reduce water heating costs through several different approaches.

- Reducing the temperature setting at their water heater to reduce standby loss.
- Reducing the standby heat loss from their water heater's tank and nearby piping
- Reducing the amount of hot water used.
- Replacing the water heater with a more efficient model.

Adjusting Water Heater Thermostats



Gas water heater thermostat controls show only "warm" and "hot" temperatures. Adjust the knob until the tap water temperature measures 120 degrees F.

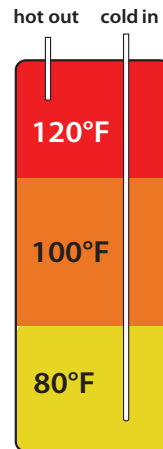
Customers can reduce their water heater's standby losses by adjusting its thermostat to a lower temperature.

Electric

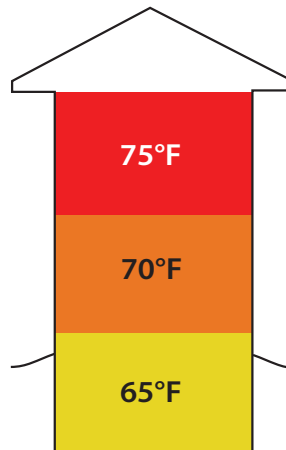


Electric water heaters have two thermostats hidden under covers on the front of the tank. Turn the power off at the electrical panel, remove the covers, and set both thermostat dials to 120 degrees F.

Building Science Temperature Stratification



Fluids, like air and water, stratify in layers according to temperature. The hottest fluid rises to the top and the coolest falls to the bottom. Temperature stratification in a water heaters allows us to harvest the hottest water off the top. Cold water is added to the bottom, which encourage this beneficial stratification.



Temperature stratification isn't beneficial to a home's occupants, who experience discomfort from temperature variations. The degree of stratification depends on the temperature of the furnace's supply air, the degree of air mixing, and the height of the building.

Water Heater Tank Improvements

The most basic conservation measure for water-heating is to reduce hot-water temperature. Customers can adjust water heater's thermostat. Measure water temperature with a thermometer at the tap closest to the water heater. Suggest to the customer to adjust the thermostat so that tap water is no hotter than 120 degrees F. This is hot enough for most household uses.

Installing a water-heater blanket with at least an R-12 insulation level is a cost-effective energy measure, unless a customer plans to replace the existing storage water heater with a more efficient model. (See “Evaluating Insulation” on page 24 for definition of R-values.) Water heaters that are more than 10 years old usually have only one inch of fiberglass insulation for a total of R-3. Water-heater insulation blankets are available in many hardware and department stores and are easy to install.

Safety is the primary consideration when installing the blanket. Follow the manufacturer’s printed instructions packaged with the blanket.

Customers can also reduce heat loss at the hot-water pipes by installing foam pipe insulation on the first five feet of both the hot and cold water lines. This reduces the standby heat loss that takes place when hot water circulates by convection up into the supply piping. For an added savings, customers can insulate all their the hot water pipes to reduce hot-water cooling as water travels to the fixtures.

Reducing Hot Water Consumption

Showering is typically the biggest hot-water use in the home. You can measure shower volume by calculating the time it takes to fill a one-gallon plastic milk jug from the shower spigot. Cut the top off to fit it over the shower head. If the jug fills in less than 12 seconds, the customer’s flow rate is more than 2½ gallons per minute. If this is the case, install a water-saving shower head rated for a flow of 1½ gallons per minute. **Installing a water-saving shower head is a job that you the auditor can accomplish.**

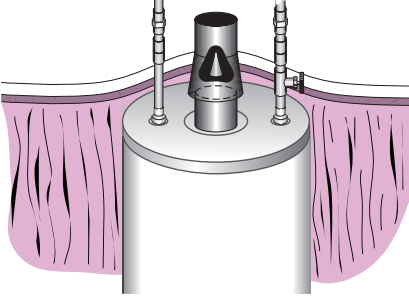
A majority of energy used by dishwashers and washing machines is consumed by the water heater to produce hot water. New dishwashers and washing machines use far less water and energy than their predecessors. Front-loading washing machines, for example, save up to half the water and energy of top-loading machines.

Hot water leaks are also a serious energy waster. Advise customer to repair any leaky faucets in their homes.

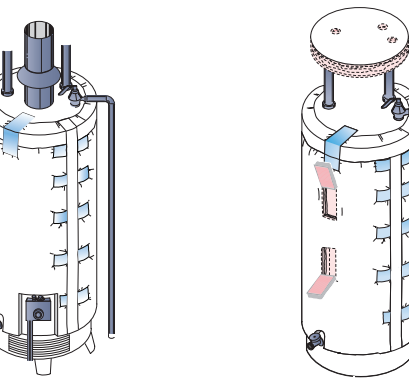
Water Heater Replacement

Some older water heaters have only an inch of fiberglass insulation (about R-3) installed between the inner tank and outer shell. However, many new gas water heaters have 2 inches of foam insulation (R-12 or more), and better electric models have 3 inches of foam (R-18 or more). More insulation helps reduce the heat loss through the walls of the tank.

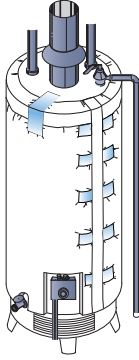
Installing Water Heater Blankets



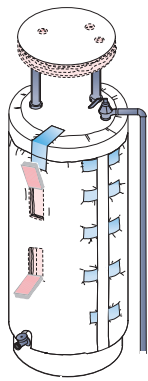
Gas water heater
Do not insulate the top of gas water heaters.



Electric water heater
Insulate the top of electric water heaters.



Keep insulation away from a gas water heater’s gas valve and burner door.



Cut out small rectangles over the elements and controls of electric water heaters.

Water heater blankets slow heat loss through the walls of the tank. This continuous heat loss accounts for 15 to 40 percent of the hot water energy cost.

Advise your customers to ask for these higher insulation levels when they buy new water heaters. This R-value information is found on the specification label attached to the water heater and on the Energy Guide label.

Recommendation for Customers Reducing Water Heating Costs

- ✓ Measure your hot water temperature, and adjust your water heater thermostat down to about 120 degrees F.
- ✓ Insulate your water heater and the water pipes near the water heater.
- ✓ Repair all faucet leaks.
- ✓ Install a low-flow shower head if your existing one uses more than 3 gallons per minute.

USING APPLIANCES EFFICIENTLY

The electricity consumed by appliances accounts for up to one third of the energy consumption in many homes. Customers can reduce their use of electricity for appliances by either using their existing appliances more efficiently, or by purchasing more efficient appliances.

Refrigerators and Freezers

New refrigerators consume as little as one-third the energy of models that are more than 10 years old. Replacing an older inefficient refrigerator with a model that uses less than 500 kilowatt-hours (kWh) per year reduces a customer's electricity costs significantly.

Offer customers these operating tips to save energy and money on refrigeration. Help the customer test temperatures and activate the Energy Saver switch if appropriate.

- Use a thermometer to measure refrigerator and freezer temperature. Adjust the dials inside the refrigerator and freezer as needed until the ther-

mometer reads 35 to 40 degrees F for the refrigerator and 0 to degrees 5 F for the freezer.

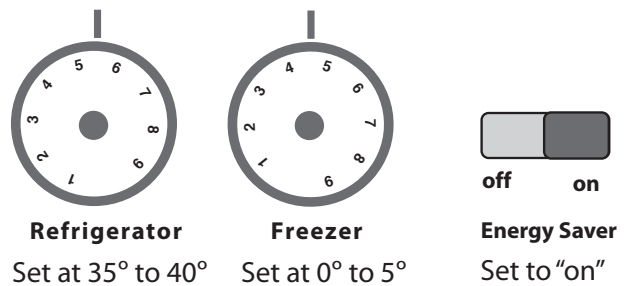
- Activate the Energy Saver switch, which turns off the anti-sweat heaters around the refrigerator door. These heaters aren't usually needed, unless the home is so humid that condensation or frost forms on the door seals.
- To limit door openings, decide exactly what you want before opening the refrigerator or freezer door. Try to remove all the items you need at once, and do the same when replacing them.

Suggest the following when a customer plans to buy a new refrigerator or freezer.

- Prefer refrigerators with an upper freezer compartment. Side-by-side refrigerator/freezers tend to use more energy.
- Prefer a chest freezer instead of an upright model, because chest freezers use less energy.
- Don't operate a second refrigerator. Make do with one large energy-efficient model.

City landfills and other disposal facilities are required to recycle refrigerators in a way that prevents the refrigerant from escaping into the atmosphere, where it could damage the ozone layer.

Setting Refrigerator and Freezer Controls



Customers can save money right away by making these simple adjustments to refrigerators and freezers.

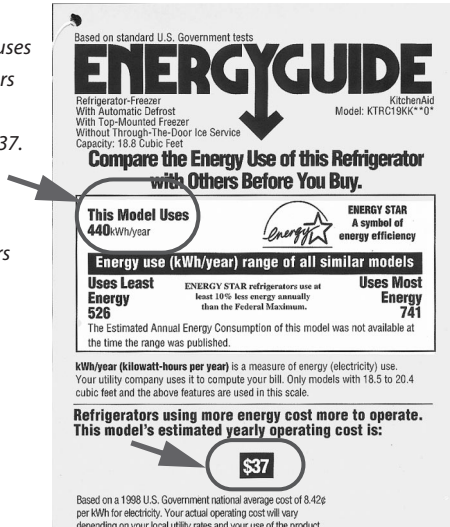
ENERGY STAR® and Energy Guide Labels

Advise customers to look for the ENERGY STAR label whenever they shop for appliances.



Wow! This new refrigerator only uses 440 kilowatt-hours annually, for an average cost of \$37.

Older refrigerators use 1000 to 1500 kilowatt-hours annually.



The Energy Guide labels is posted on all major appliances before they are sold. They help customers compare the annual energy use of the labeled model to its competitors.

Electric Cost of Appliances

Appliance	Usage, kWh per year	Annual Cost
Ten-year-old refrigerator or freezer	900-1800	\$90-\$180
New ENERGY STAR refrigerator or freezer	450-550	\$45-\$55
Hot tub / spa	2300	\$230
Water bed	1000	\$100
Television	100-1000	\$10-\$100
Well pump	500	\$50
Furnace fan (air handler)	500	\$50
Computer	50-400	\$5-\$40
Humidifier	50-1500	\$45-\$150
Engine heater	100-400	\$10-\$40

Data from Lawrence Berkeley Laboratory and others. Based on electric costs of 10¢ per kilowatt-hour.

Laundry Savings

Front-loading washing machines use far less energy and water than top-loading machines. According to recent field tests, a front-loading machine will use up to 60% less energy, 40% less water, and 20% less detergent than with a top-loading machine.

Front-loading washers cost between 50 and 100 percent more than conventional top-loading models but will repay the initial investment in 2 to 5 years, if the customer currently use warm or hot water for clothes washing. Front loaders will cut water usage and cost in addition to their energy savings.

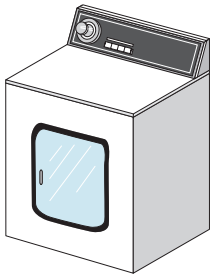
The faster spinning front-loading washer also gets the clothes far drier than a top-loading washer. This saves approximately 20 percent of the energy needed for clothes drying.

When possible, dryers should be installed on an exterior wall to minimize the length of dryer duct leading outdoors. Every foot of dryer vent, and every bend in the vent, reduces the amount of air that passes through the dryer, and increases drying time and expense.

Smooth aluminum dryer vent pipe saves considerable energy over flexible plastic tubing. Smooth vent pipe has far less airflow resistance and results in faster and more economical drying.

Old-fashioned timer controls run the dryer for as long as customers sets them, even if the clothes are dry before the cycle is finished. The new automatic temperature or humidity-sensing dryer controls shut the dryer off as soon as clothes are dry. This saves 10 to 15 percent of the cost of running a dryer and prolongs the life of clothing.

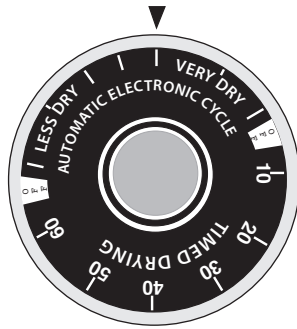
Reducing Laundry Energy Costs



Front-Loading Washer

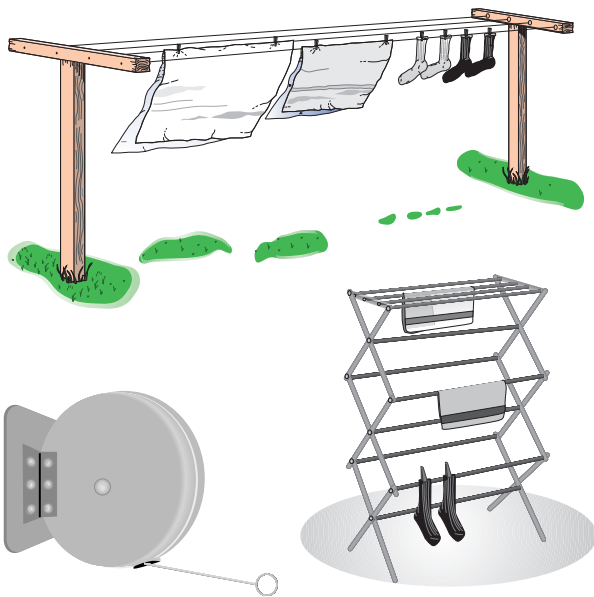
Front-loading clothes washers are more expensive to purchase than top-loading machines. But if customers usually wash with warm or hot water, these models provide an excellent energy savings.

Somewhere in the middle of a dryer's "automatic" range is a setting that dries clothes without wasting energy by over-drying them.



Dryer Control

Save Money by Using a Clothesline



A clothes line is one of the best energy saving devices around. Customers can save a hundred or more dollars a year by drying clothes during dry weather on a clothes line, clothes rack, or a space-saving retractable line.

Recommendations for Customers Using Appliances Efficiently

- ✓ Measure your refrigerator temperature and set at 35 to 40 degrees F. Measure your freezer temperature and set it to 0 to 5 degrees F.
- ✓ Run your dishwasher with full loads only.
- ✓ Set your washing machine to use warm or cool wash and rinse temperatures. Run your washer and dryer with full loads only.
- ✓ Clean your dryer's lint filter after each cycle. Use the electronic or automatic cycle instead of the timer. Consider drying clothes completely on a clothesline, or at least until they are almost dry, finishing in the dryer. They will have the tumbled texture of dryer clothes with less than half the energy use.
- ✓ Evaluate the age and energy efficiency of your refrigerator, dishwasher, and washing machine. Consider appliance replacements with ENERGY STAR labeled appliances.

IMPROVING LIGHTING EFFICIENCY

The average family dedicates up one-fifth of their electrical use to lighting. Fortunately, lighting retrofits are among the easiest energy conservation measures to perform. This is another energy conservation measure that you, the auditor, can perform or help your customer to perform.

Common incandescent light bulbs use 90 percent of their energy producing heat and only 10 percent producing light, making them the most inefficient energy-using device in our homes.

Compact Fluorescent Lights

Compact fluorescent lights (CFLs) use one-quarter to one-third the energy of incandescent lights. They last up to ten times longer than incandescent bulbs and they screw into a standard light socket.

CFLs should be used in the light fixtures that you use the most. Start by replacing incandescent lights that are on four hours a day or more, such as those in the kitchen, bathroom and living room.

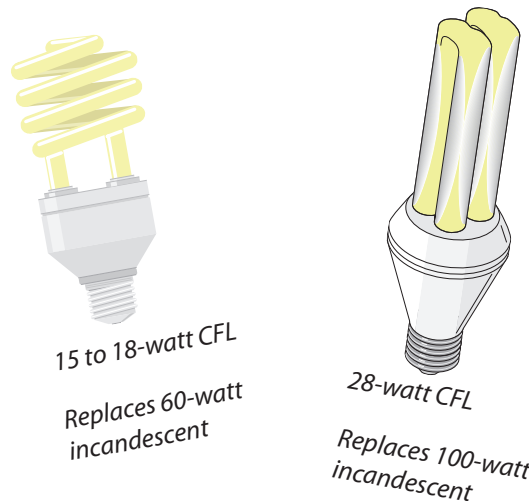
Standard CFLs are slightly larger than incandescent light bulbs and may not fit all fixtures. But the smallest compact fluorescent lights, called sub-compact fluorescents, are nearly the same size as incandescent light bulbs.

If you plan to replace an entire light fixture, or are choosing fixtures for a new home, select fixtures that are designed for CFLs. Dedicated CFL fixtures have pin-based replaceable CFL bulbs rather than screw-in bases like standard bulbs. They also include improved reflectors that distribute light more evenly.

Recommendations for Customers Improving Lighting Efficiency

- ✓ Buy and install compact fluorescent bulbs in any fixtures you use more than one hour per day. Replace the most used lamps first. Choose a wattage of one-third to one-quarter the size of the incandescent bulb it will replace.
- ✓ Purchase dedicated CFL fixtures when you next buy light fixtures.

Compact Fluorescent Lamps



Replacing standard bulbs with compact fluorescent lamps is easy, and savings begin immediately.