

Do-It-Yourself Home Energy Audit



An energy-efficient home is comfortable to live in and less expensive to heat and cool. This guide will walk you through a simple audit to help you identify ways to improve your home's efficiency. Use the checklist on the back to note any problem areas.

This audit covers the systems that are the major energy users in your home. There are many other factors that affect energy costs, including home appliances, lighting, and your energy usage habits.



What You'll Need:

Pen or pencil

Dust mask

Gloves

Ladder

Flashlight

Incense stick

Screwdriver

Tape measure or ruler

Important Safety Information:

Attics and crawlspaces can contain a variety of materials you'll want to avoid contact with. Be sure to wear appropriate safety equipment. Use caution around:

Asbestos: Some older homes still have asbestos around pipes, air ducts, and heating equipment, in siding and roofing materials, and in vermiculite insulation. It may look like a grey or white fibrous material. Asbestos is dangerous when the fibers are released and inhaled into the lungs - if you suspect anything contains asbestos, leave it alone. Limit access to the area and do not disturb or touch it.

Fiberglass Insulation: Use a dust mask, goggles and gloves to protect lungs, eyes and skin from fiberglass particles.

Wiring: Turn off electricity at the breaker before probing for insulation in the vicinity of any wiring. Consult an electrician if you see bare wires or electrical connections not contained within covered boxes.

1. Air leakage

Air leaks can increase your home heating and cooling costs as much as 20% and cause uncomfortable drafts. Sealing air leaks is a cost-effective way to reduce energy costs and improve comfort.

You may be able to find large air leaks by simple inspection, especially on a windy day. For a more thorough approach, conduct a basic depressurization test. First, close all exterior doors and windows. Second, turn off all combustion appliances such as gas burning fireplaces or water heaters. Third, turn on all exhaust devices including the clothes dryer and kitchen and bathroom fans, or use a large fan to suck the air out of one window. This will slightly depressurize your house and pull air in through the leaks, making them easier to detect. Use an incense stick or a damp hand to identify air movement in these places:

- Along the edge of the flooring
- Wall and ceiling junctures
- Outlets & wall plates
- Plumbing penetrations under sinks
- Attic & crawl space hatches
- Fireplace dampers
- Around doors & windows
- Wall or window air conditioners
- Pet doors



2. Insulation, doors and windows

Heat loss through your ceiling, walls and floor could be significant if you don't have enough insulation. If your home was built before 1990 and has not had an insulation upgrade, it is very likely time for one! And if you have single or double-pane, aluminum framed windows, you should consider replacing them.

Attic:

- ✓ Measure the depth of the insulation in your attic, over the heated spaces in your home. (Unheated spaces such as garages and covered patios don't need attic insulation.)
- ✓ Use the chart to calculate the R-value of your insulation. Today's building codes call for R-38 insulation in ceilings, although existing homes built to earlier standards will have far less.
- ✓ If your attic hatch is located above a conditioned space, check to see that it is well insulated, weather stripped and closes tightly.

Walls:

- ✓ To check for insulation in your exterior walls, shut off the breaker to a wall switch, then unscrew the cover plate and shine a flashlight between the plaster and the edge of the electrical box. You may also use a plastic utensil to probe gently next to the box. Be careful not to damage electrical wiring.

Floors:

- ✓ Look at the underside of any floor over an unheated space such as an unfinished basement, garage or crawl space. Inspect and measure the thickness of any insulation you find there. Today's building codes call for R-25 insulation under floors over unheated spaces.

Doors & Windows:

- ✓ Inspect your windows. Look for any fogging between the panes, which indicates a broken seal. Note the frame type and the number of glass panes.
- ✓ Note whether your exterior doors are made of wood or are steel or fiberglass insulated doors.

Calculate the R-value Of Your Insulation

An R-value indicates an insulation's resistance to heat flow. Higher R-values indicate greater insulating effectiveness.

What you See		What it Probably Is	Depth (inches)	Total R-Value
Loose Fibers	lightweight yellow, pink or white	fiberglass		= 2.5 x depth = _____
	dense gray or near-white, may have black specks	rock wool		= 2.8 x depth = _____
Granules	small gray flat pieces or fibers (from newsprint)	cellulose		= 3.5 x depth = _____
	light weight	vermiculite or perlite		= 2.4 x depth = _____
Batts	light-weight yellow, pink or white	fiberglass		= 3.2 x depth = _____



3. Heating system

Heating systems account for about 40% of home energy use. A properly maintained heating system can use 30-50% less energy than a poor performing one.

Central Forced Air Heating Systems

- ✓ Clean or replace furnace filters monthly.
- ✓ Have your heating system inspected and tuned up annually.
- ✓ If your ductwork runs through an unheated space such as a basement or crawlspace, determine whether or not it is insulated.
- ✓ Check the joints between the sections of ductwork to ensure they are properly sealed with mastic, not duct tape. Note any open or damaged joints.
- ✓ Check for air leaks around each air register.

Zonal Heating Systems

- ✓ Ensure baseboards or wall heaters are clean and dust free.
- ✓ Check for automatic setback thermostats. Consider installing them if you don't have them.
- ✓ Ensure that zonal heaters in unoccupied rooms are turned off.



If you heat with baseboards, ceiling cables or wall heaters, consider installing a ductless heat pump.

Ductless systems are easily installed and much less expensive to operate than electric resistance heat. They also provide summer cooling. There are great rebate and tax credit programs for ductless systems. Call our Energy Experts to learn more.



4. Water heating and water usage

Water heating can account for up to 30% of your home energy usage. A well insulated hot water system, set to the proper temperature and used with low-flow faucets and showerheads, will maximize energy savings.

- ✓ Check your water temperature by running hot water over a candy or meat thermometer. It should be between 120°F and 130°F. If you need to adjust the temperature on your water heater, be aware that most models have two thermostats, and both thermostats should be set at the same temperature. Turn off the water heater at the breaker before opening the thermostat cover.
- ✓ Check to see if faucets and showerheads are low-flow models. Showerheads and kitchen faucets should be 1.5 - 2.2 gallons per minute (GPM). Bathroom faucets should be 0.8 - 1.5 GPM. If the GPM rating isn't shown on the faucet, turn it on and put a container under the fixture. Collect the water for 10 seconds, then measure the amount of water you collected. Convert your measurement to gallons and multiply it by 6 to get the GPM.
- ✓ Although newer water heaters are well insulated, many older models are not. If your water heater is more than 15 years old, consider replacing it with a new high-efficiency model.

Is it time for a professional weatherization inspection?

Following the steps in this guide will help you identify areas for improvement. For a more thorough analysis, consider scheduling a professional inspection. Your heating fuel determines which organization will provide the inspection:



- ✓ **If you heat with electricity**, our Energy Experts will conduct a free in-home energy use evaluation. To schedule an appointment, call (503) 366-5470 or email experts@crpud.org.
- ✓ **If you heat with natural gas**, the Energy Trust of Oregon provides free Home Energy Reviews. To schedule a review, call 866-368-7878 or visit <http://www.energytrust.org>
- ✓ **If you heat with oil, butane, propane, kerosene or wood**, contact the Oregon Department of Energy about the State Home Oil Weatherization (SHOW) program. Call (800) 221-8035 or visit <http://www.oregon.gov/energy>.

Energy Efficiency Rebate Programs

The PUD's Energy Experts offer many rebate programs to help you use energy wisely. To learn more, visit www.crpud.net, call (503) 366-5470, or email experts@crpud.org.

- Home Weatherization
- ENERGY STAR® Windows
- Insulation Upgrades
- Duct Testing/Sealing
- Air Source Heat Pumps
- Ductless Heat Pumps
- Geothermal Heat Pumps
- Marathon® Water Heaters
- ENERGY STAR® Appliances
- ENERGY STAR® New Homes
- ENERGY STAR® Manufactured Homes

State & Federal Tax Credits

State and federal tax credits are available for many efficiency upgrades. Learn more:

- www.oregon.gov/energy
- www.energystar.gov/taxcredits

Home Energy Audit Checklist

Use this sheet to make notes of what you find during your audit.

Air Leaks

Location	Leaks Detected	Notes
Along flooring edge		
Wall/ceiling junctures		
Electrical outlets		
Switch plates		
Window frames		
Around doors		
Fireplace dampers		
Attic hatches		
Wall/window-mounted A/C units		

Insulation, Windows and Doors

Location	Notes
Attic, over heated space	
Exterior walls	
Under floors	
Window frame type(s)	
Exterior door type(s)	

Central Heating System

	Notes
Furnace filters cleaned or changed monthly	
Annual inspection/maintenance performed regularly	
Filters cleaned or changed monthly	
Ductwork is sealed and insulated	
Air registers are sealed against air leaks	

Water Heater and Water Usage

	Notes
Temperature set at 120 degrees	
Faucets and showerheads are low-flow models	
Water heater age	