

ENERGY SMARTS: CHECKLIST TO DETERMINE ENERGY EFFICIENCY OF A HOME

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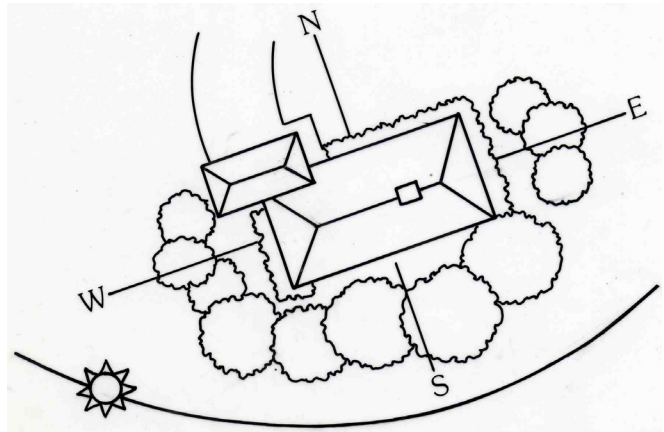
If you are purchasing a new or older home, it is important to select a home that is energy efficient. An energy efficient home can save you thousands of dollars in long term energy costs. The information found in this fact sheet will help you make an informed decision about purchasing a home that is energy efficient. If you are unable to answer most of these questions, you will need to obtain a friend, contractor, inspector, or energy auditor who can answer them for you.

The Utah Energy Conservation Coalition provides energy audits for many areas of Utah (800-550-8322). Also, furnace dealers, heating contractors, and insulation contractors may perform energy audits. Regardless of who conducts the energy audit, make sure you obtain a completed copy of the audit, and it is a good idea to accompany the auditor during the inspection so you understand the results.

SITE SELECTION & ORIENTATION

- √ Is the home placed on the site so that the long or main axis of the house runs east and west for maximum solar gain in the winter? (See Figure 1).
- √ To gain maximum benefits from free solar heat in the winter, are windows on the south side of the house?
- √ Are the window roof overhangs the correct depth so that sunlight does not penetrate into house during the summer? (see Figure 2).
- √ Are there operable windows placed so that the summer breezes, from prevailing winds, cool the house?
- √ Are windows on the north side at a minimum? Windows on the north side generally contribute to heat loss because of the cold northern winds.
- √ If the house does not have an overhang on the west, is there a limited number of windows facing west, or trees to block summer sunlight and heat? Windows

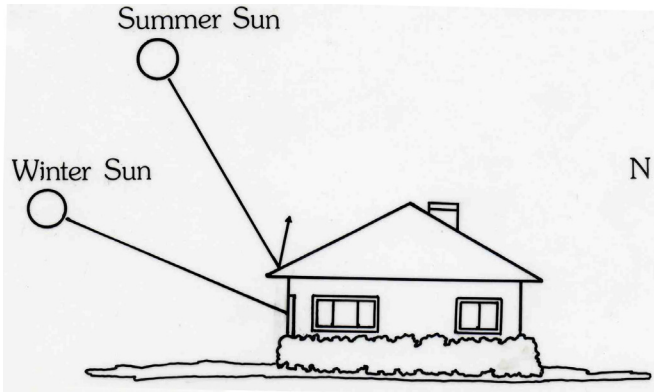
Figure 1. Long Axis of House East and West



facing west that are not shielded in some way, receive direct afternoon summer sunlight and also cold winds that increase heat loss during the winter.

- ✓ Are unheated areas and the garage on the sides of the house that receive most winter winds? These areas can serve as buffers.

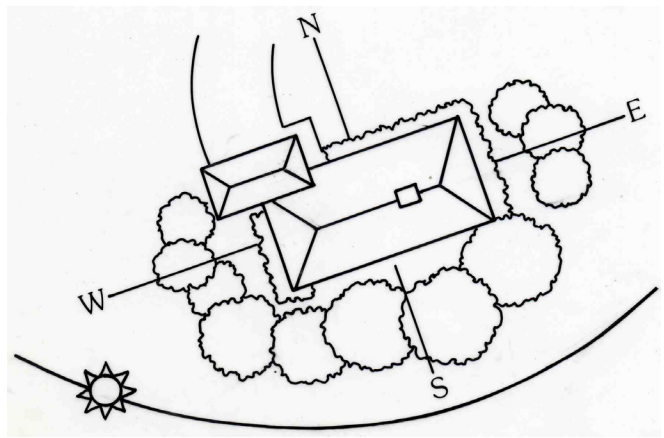
Figure 2. Roof Overhangs Proper Depth



SHADING & SCREENING

- ✓ Is the roof overhang, including rain gutter, at least 30 inches to provide shading from direct summer sunlight? Since the angle of the sun is low in the winter and high in the summer, the roof overhang should shade the windows from the high summer sunlight but still permit the sunlight to warm the house in the winter (see Figure 2). For very precise calculations on overhangs, refer to fact sheet “Energy Smarts: Solar South, Roof Overhangs, and Light Shelves.”
- ✓ Does the house have other shading and screening devices, such as wooden trellises, louvered overhangs, awnings, horizontal and vertical louvered panels, adjustable shutters for windows and doors, masonry grills, or extended porches?
- ✓ Does the house have deciduous (leaf bearing) trees on the south, east, and west sides? Deciduous trees on the south, east, and west sides of the house provide summer shade and when they shed their leaves, they let the sunlight warm the house in the winter (see Figure 3).
- ✓ Does the house have windbreaks such as evergreens, shrubs, and tall wooden fences, which can protect it from cold wind?

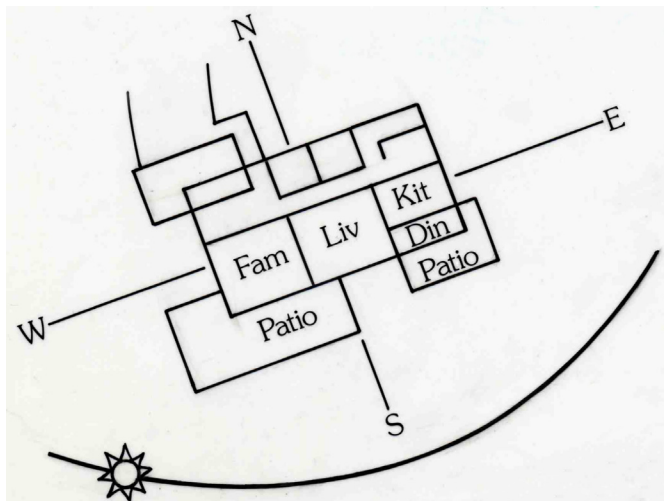
Figure 3. Deciduous Trees on South, East, and West



DESIGN

- ✓ Are the rooms most used during daylight hours oriented to the south to reduce the need for artificial lighting (see Figure 4)?

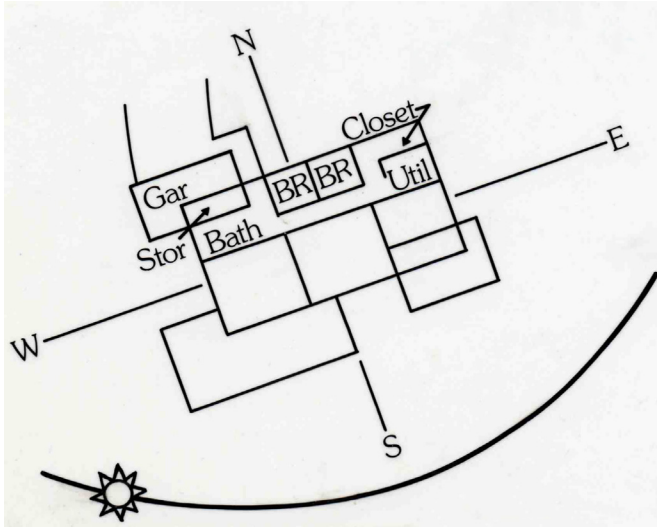
Figure 4. Most Used Rooms During the Day



- ✓ Can bedroom areas or other unused rooms be closed off or zone-controlled to reduce heating and air conditioning when not in use?
- ✓ Are the living areas on the southern and eastern portions of the home and the sleeping areas on the northern side? Southern and eastern portions of the home should be used for the living areas and the sleeping areas should be on the north (see Figure 5).
- ✓ Is the house planned for energy efficiency? A simple rule governs overall energy-efficient design which is

that a house should have a minimum of outside surface exposed. A square shaped floor plan provides the least exterior surface, therefore loses less heat during the winter when compared to an oblong or spread-out design.

Figure 5. Least Used Rooms on North



- √ Is the house partially below ground? A two-story house or a house with the lower level built partially below ground will cost less to heat or cool per square foot than a sprawling, one-story ranch style house.
- √ Is the thermostat located on an inside room partition or wall so as to react to actual room temperatures without influence from sunlight, drafts, or appliances?

INSULATION

- √ Is there a vapor barrier under the sheetrock on the inside wall?
- √ Are there proper amounts of insulation in the ceiling and attic? In cold climates, the minimum recommended insulation for the ceiling and attic is R-38.
- √ Is the insulation in the attic evenly installed with no holes or gaps except around vents and some recessed light fixtures? Depending on the design, recessed light fixtures can have insulation covering the fixture in the attic.
- √ Is the attic access insulated and weatherized?

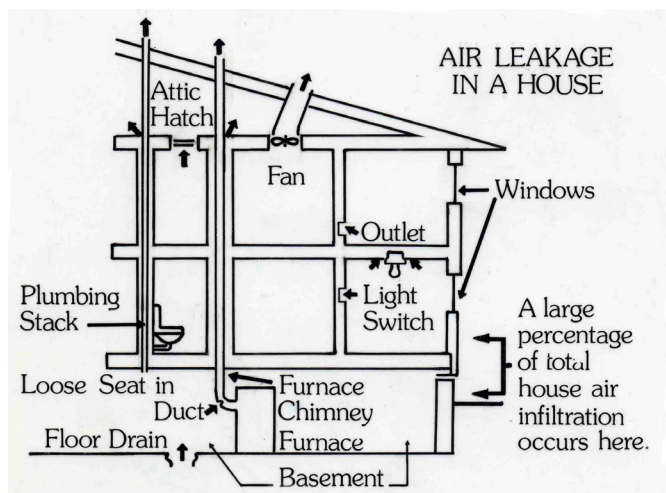
√ Are there proper amounts of insulation in the walls? In cold climates, the minimum recommended for walls is R-19. To see if there is insulation in the walls, turn off the power and remove the cover from an electric outlet on an exterior wall. Using a plastic probe, check for insulation. This will only tell that there is insulation in the walls, not how much.

- √ Are there proper amounts of insulation in the floors and crawl spaces? In cold climates, the minimum recommended insulation for the floors over unheated spaces and crawl spaces is R-19 (not vented). For vented crawl spaces the recommendation is R-30.
- √ Is the rim joist insulated where the floor joists end at the top of the basement wall?
- √ Are the sill plates insulated, sealed, or caulked to reduce infiltration?
- √ Are the heating ducts and hot water pipes that pass through unheated areas sealed and insulated and pipes that pass through heated areas sealed? Energy loss from the duct system can be as much as 15 to 25 percent of the heating and cooling bill.

INFILTRATION

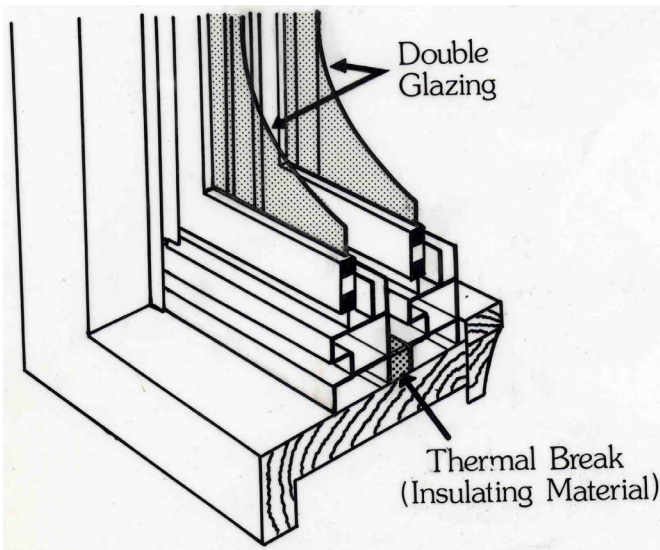
- √ Are the outlets, fixtures, and switch plates properly insulated so that you cannot feel air movement when you put a hand in front of them (see Figure 6)?

Figure 6. Air Leakage



- √ If there is a fireplace, does the fireplace damper fit tightly so that you cannot see light or a gap around the closed damper? Otherwise a great deal of heating and cooling can be lost up the chimney.
- √ Do kitchen, bath, and laundry exhaust fans have positive-closure dampers?
- √ Is the attic ventilated using soffit or roof vents?
- √ Are the window and door frames caulked on the inside and weather-stripped?
- √ Are the windows made of high quality double pane glass? Double pane insulating glass should be used throughout the house.
- √ Do the windows have low-emissivity (Low-E) coatings and are they gas filled?
- √ Are the window frames quality construction? Window frames and their quality construction and installation are as important as the insulating value of the glass (see Figure 7). Wood and vinyl frames offer the best insulating value today. For more information about windows, refer to fact sheet "Energy Smarts: Windows."

Figure 7. Energy Efficient Windows



- √ Is the entrance door protected from the cold outside air by an air-lock or vestibule?
- √ Are the exterior doors insulated and weather stripped? Be sure the weather stripping is in place and that it stops air infiltration into the house. Just by placing your hand around the door, you may be able to feel the air coming into the house.
- √ Are the exterior doors made out of steel or fiberglass and insulated?

HEATING AND COOLING SYSTEMS

- √ Is the heating system energy efficient? Find the brand and model number on the furnace, then check with the dealer or manufacturer for A.F.U.E. rating. The higher the rating, the more efficient.
- √ Does the heating system have an Energy Star® logo meaning that the system exceeds Government energy standards (see Figure 8)?

Figure 8. Energy Star® Logo



Money Isn't All You're Saving

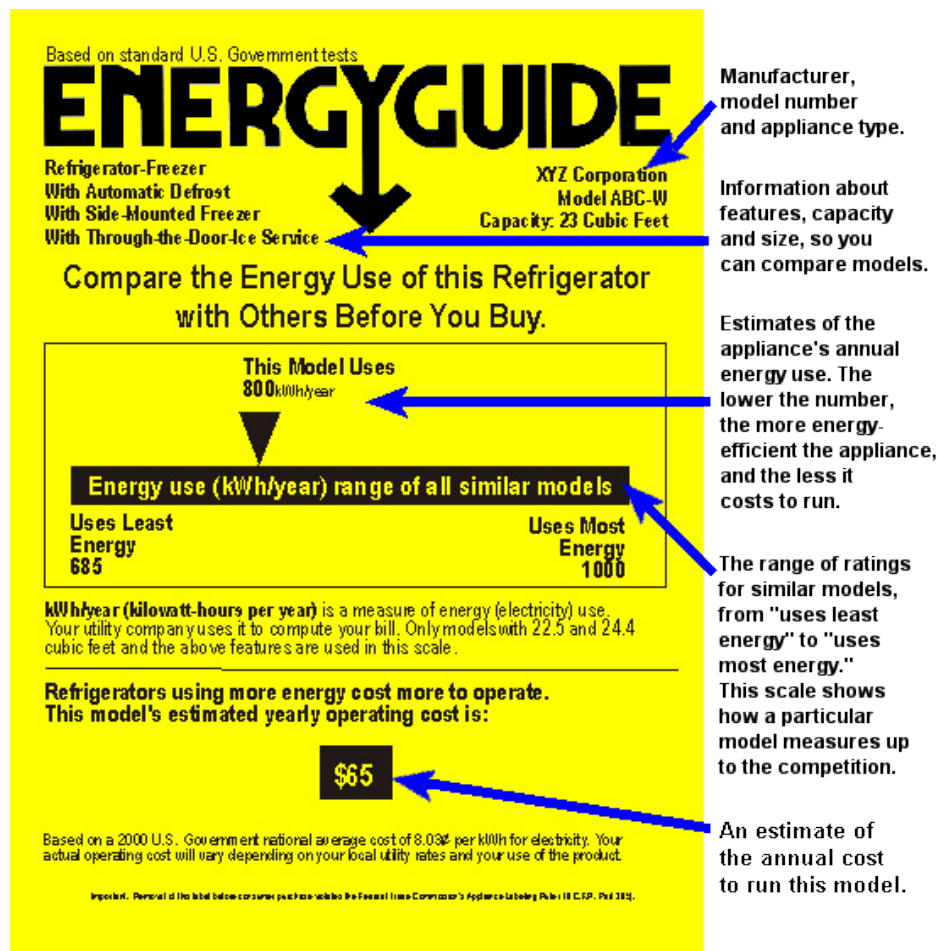
(Printed with permission from EnergyStar®)

- √ Is there an automatic thermostat that controls the central heating and air conditioning?
- √ Are there individual room controls or zones for precise heating control?
- √ Are there outside combustion air intakes for furnaces and fireplaces?
- √ Are all heating elements operating properly? After the thermostat is turned up 5 degrees, hot water and steam radiators should provide heat within 15 minutes and all forced or gravity hot-air registers should provide heat in 5 minutes.

HOT WATER SYSTEM

- √ Is the water heater close to areas of major use? By placing the water heater close to where water will be used, heat loss through pipes is minimized.
- √ Is the water heater energy efficient? See if the energy efficient label is still on the water heater. You can also check efficiency by noting the fuel type, brand, model, then compare water heater to other models at the retail store. Look for the Energy Star® logo.
- √ Are the hot water pipes wrapped with insulation?
- √ Do the shower heads have flow restrictors to save on hot water? Flow restrictors can cut the flow of water by 40 to 60 percent.

Figure 9. Energy Guide Label



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KITCHENS

- √ Are the appliances energy efficient? Energy efficiency can vary considerably among appliances of similar size and features. Compare dollar figures found on energy guide labels with other appliances in the retail store (see Figure 9).
- √ Do the appliances have an Energy Star® logo indicating appliance exceeds Government standards on energy efficiency.
- √ Are the cabinets, countertops, and floors light colored? Light colors reflect more light and thus reduce the artificial illumination requirement.
- √ Are fluorescent tubes or bulbs used to light the kitchen? Fluorescent lighting is more energy efficient than incandescent lighting and when used throughout the house can reduce lighting utility costs by 75 percent.

- √ Is the refrigerator placed in the coolest part of the kitchen, well away from the range, oven, direct sunlight, or a heating vent?

FINANCIAL

- √ Is the home energy efficient? If the house you plan to purchase is energy efficient, you may qualify for an "Energy Efficient Mortgage" or special financial incentives. Ask your lender about them.

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