

Touchstone Energy[®] Home



Touchstone Energy[®]
HOME

Promoting Energy Efficiency

A publication of Alabama Electric Cooperative and its member cooperatives

I N T R O D U C T I O N

Your local Touchstone Energy® Cooperative has long placed a priority on promoting energy efficiency to their customers. In a recent survey of customers throughout Alabama and Florida, responses were overwhelmingly in support of a well-insulated, electrically heated home:

- More energy efficient
- Less expensive to operate
- Cleaner and safer
- More comfortable.

So why introduce the new Touchstone Energy® Home? It's simple, really. Over time, building codes and common practices among builders and contractors made yesterday's "energy efficient" home today's standard model. Touchstone Energy® Cooperatives wanted to reward customers for exceeding the ordinary and, at the same time, link everything with the Touchstone Energy® connection among customer-owned electric systems around the country. The Touchstone Energy® Home was born.

After months of planning, Touchstone Energy® Cooperatives in Alabama and Florida adopted a set of qualifications for the Touchstone Energy® Home program specially designed for the region of Alabama and Florida. The Touchstone Energy® Home features are:

- R-16 wall insulation
- R-38 ceiling insulation
- Attic ventilation

- R-19 floor insulation
- Double pane windows or single pane with storm windows
- Metal insulated doors
- Infiltration control to help prevent air from leaking into the home
- Exhaust systems in bathrooms and kitchen
- An exterior house wrap
- Heating and cooling ducts located in conditioned space
- An energy-efficient electric water heater
- A high-efficiency electric heat pump.

The Touchstone Energy® Home standards apply to new and existing homes whose owners want them to be more energy efficient.

In the pages that follow, you'll find out more about the Touchstone Energy® Home program and about individual components that make it such a wise investment for homeowners.

All of the information you need about the program is in this booklet, but if you'd like to take a virtual tour of the Touchstone Energy® Home, you can do so by logging on to your local Touchstone Energy® Cooperative's web site.

You may log on to www.powersouth.com for the web address of your local Touchstone Energy® Cooperative.

MAKING YOUR HOME MORE ENERGY EFFICIENT

There are two forces that affect the comfort level of any home—new or existing. One is air infiltration, the other is heat loss (in winter) or heat gain (in summer).

Proper insulation and weatherization techniques have a positive impact on both infiltration and heat loss/gain.

Air infiltration is the movement of air into your house. It can come in through cracks around doors or windows. It can come in around openings where utility or plumbing service enters the house. It can even come in through small openings, such as electrical outlets or wall switches on outside walls.

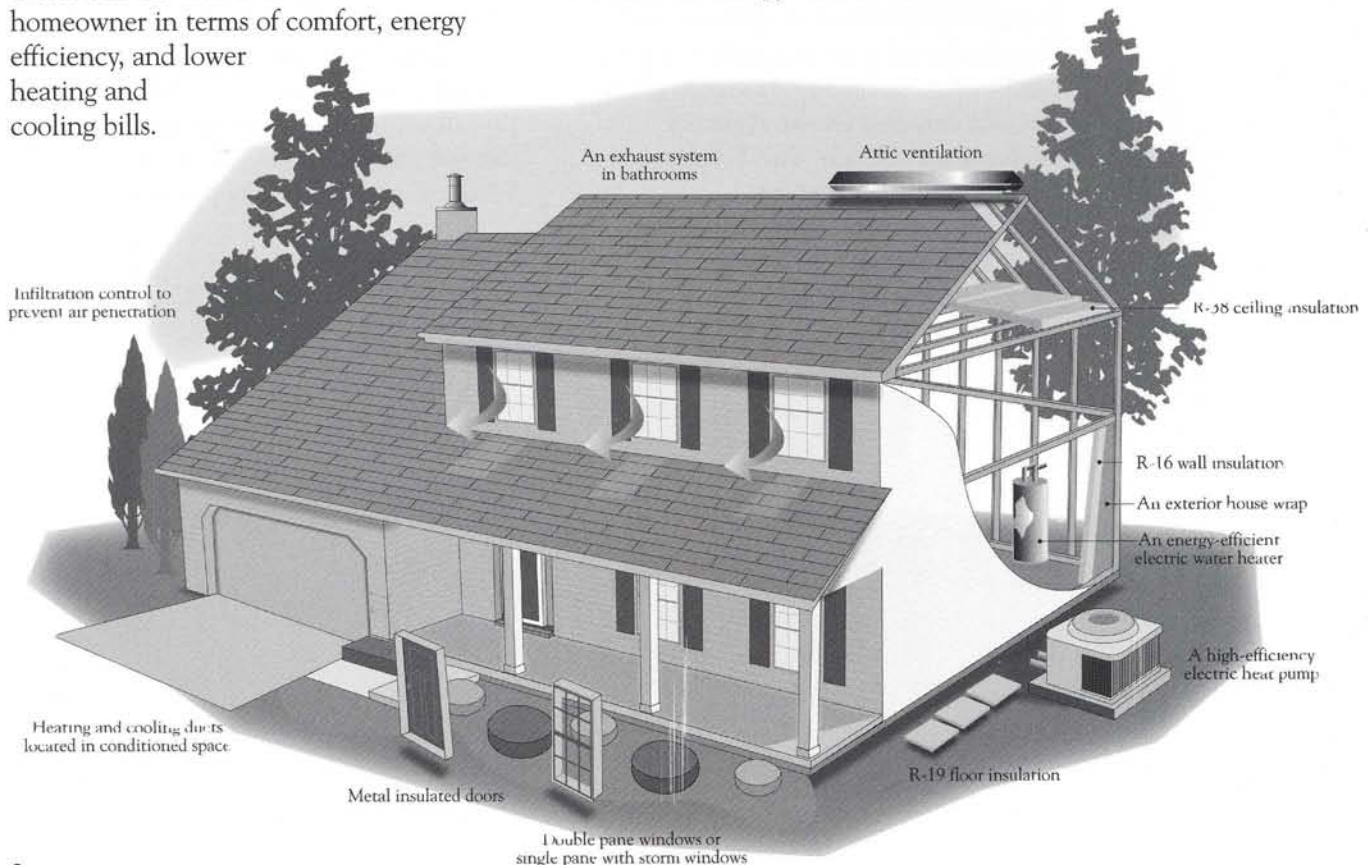
Heat loss/gain is the transfer of heat through walls, floors, ceilings, doors and windows.

Under standard building conditions, air infiltration is not blocked well and controlling heat transfer is not as good as it should be for this region. By building homes to the Touchstone Energy® Home standards, both forces are controlled much better and the results are beneficial to the homeowner in terms of comfort, energy efficiency, and lower heating and cooling bills.

Adequately blocking air infiltration requires a number of weatherization techniques that can be used on both a new or existing home. Efforts to create an airtight seal around the home's interior during construction are among the most cost-effective measures that can be made.

While leaks are fairly simple and inexpensive to seal during construction, they are almost impossible to seal later.

Begin by asking your builder or contractor to seal unnecessary leaks. One of the worst offenders is the sole plate, the place where the walls meet the floor. A strip of insulation and a bead of silicone caulk applied to the sole plate prior to erecting the walls eliminates this major infiltration point. Over-sized holes cut for wires or pipes should be filled with caulk or foam insulation, and anywhere dissimilar building materials meet should also be sealed. Don't forget electrical and switch-plate outlets. They should be sealed with foam gaskets. These practices should be done to ensure your home is built to the Touchstone Energy® Home standards.



WALLS AND CEILINGS

Insulating materials are rated by R-values. That rating simply measures how effective the material is at blocking heat transfer. The higher the R-value, the better insulation of the home.

Modern insulating materials come in two popular types: fiberglass and cellulose. The fiberglass material comes in batts—small blankets of material in several different depths—and as loose material that can be blown into certain areas. The cellulose typically is blown into areas as a wet mixture. As it dries, it not only provides insulation, it has the advantage of helping block infiltration, as well.

For the Touchstone Energy® Home, the insulation requirements are R-16 for exterior walls, R-38 for conventional ventilated attics and R-19 for floors over open or enclosed crawl spaces.



Combining 3.5" R-13 fiberglass with foam board to the exterior walls, plus the final exterior finish, be it wood, brick or vinyl will bring the R-value of the wall to the minimum of R-16.

The R-16 requirement for walls is attainable in a number of ways. For example, most homes are built with 2"x4" studs. A 3.5" R-13 fiberglass batt should be used. Adding foam board to the exterior walls, plus the final exterior finish, be it wood, brick or vinyl will bring the R-value of the wall to the minimum of R-16.

A good rule of thumb to use when deciding where to place wall insulation is that all heated or cooled areas should be separated from un-conditioned areas with insulation. Regardless of your home's layout, you can use this rule to determine where insulation should be installed. If cellulose is used instead of fiberglass, the same 2"x4" studded wall would have an R-value of 13.

If 2"x6" studs are used, blown in cellulose will achieve an R-19—actually higher than the Touchstone Energy® Home standards. Seven-inch fiberglass batts compressed into the cavity would equal about an R-15 rating.

The best way to assure that proper insulation levels have been reached is to make sure your builder or remodeler works closely with your local Touchstone Energy® Cooperative.

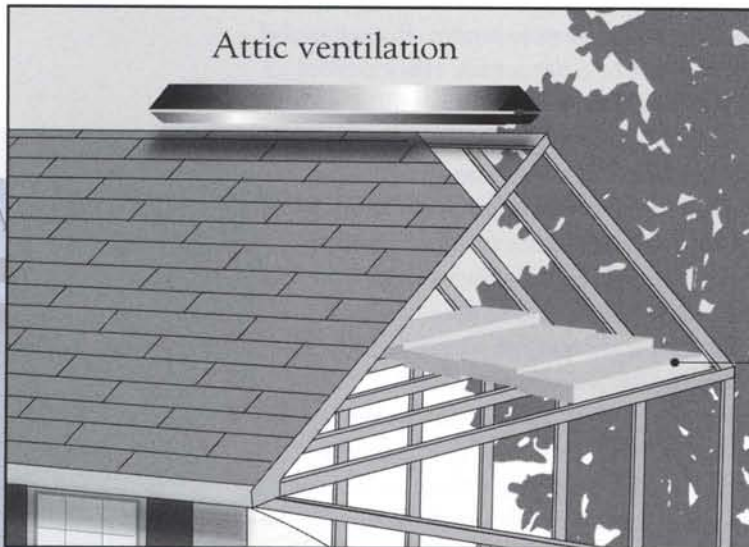
If your attic is not a living space, your ceiling should be insulated because it is the barrier between the conditioned and the unconditioned space. As with walls, it's possible to reach the required R-value—R-38—in a couple of different ways. If your builder or contractor is using fiberglass batts, two batts rated R-19 can be stacked on top of each other (be sure the top layer runs across the bottom layer, not in the same direction).

Cellulose contractors will simply blow in about 10 inches of material in the attic area of the home to reach the R-38 value.

Regardless of whether you use cellulose or batts, make sure the insulating material does not block the attic ventilation. More on that later.

Knee walls—a common building component in 1 1/2 story homes—should be insulated just as walls would be.

VENTILATION



The recommended type of ventilation is a continuous ridge vent, or a thermostatically controlled power vent combined with soffit vents.

Proper ventilation in the attic is important in a Touchstone Energy® Home for a couple of reasons. First, it helps remove heat. Second, it can prevent unnecessary moisture buildup, which can reduce the efficiency of the insulating material. Ventilation controls heat and moisture buildup in attic, crawl space and uninsulated wall cavities. Good ventilation helps cool the house during hot weather and helps prevent structural damage caused by condensation in winter. Ventilation in attics and crawl spaces should not be blocked to reduce heat loss. Such blockages trap heat and moisture that can cause severe damage to the home's structure.

Attics should be ventilated year round to reduce the build-up of heat and moisture. In winter, attic ventilation expels moisture that otherwise might accumulate and deteriorate insulation or other building materials. Don't be tempted to seal the vents to conserve energy. Sealing them could cause costly moisture damage. In summer, proper ventilation reduces roof and ceiling temperatures thereby lowering cooling costs and extending roof life. Attic heat, which would otherwise intensify, pouring unwanted heat down through the attic floor into the living area, will escape naturally if vent area is provided.

The recommended type of ventilation is a continuous ridge vent, or a thermostatically controlled power vent combined with soffit vents.

One of the most effective ways to ventilate a roof is the combination of a continuous ridge vent along the top of the roof with soffit vents along the sides. This creates plenty of area for the temperature differential to form, allowing warmer air to exit at the highest point in the attic. Roof vents come in a wide variety of types, some turbine-style vents even spin. Studies show the effectiveness of passive vents is about the same whether they are stationary or moveable. Power vents will draw more air out of the attic, but any energy savings attributable to them must be tempered with the fact that they use energy to operate.

FLOORS

Heat loss through basement and foundation walls is often neglected even in new houses. But in fact, in an otherwise well-insulated and tight house, as much as 20 percent of the total heat loss can occur through walls not being insulated.

Insulating a home's foundation or floor is usually the second most cost-effective insulation measure a homeowner can practice. The old adage is that heat rises, and—to a certain degree—it's true. But remember, heat always is looking to transfer itself to a cooler area. If that's through an uninsulated or poorly insulated floor, you're going to have an energy drain right under your feet.

The Touchstone Energy® Home standards call for R-19 floor insulation over open and closed crawl spaces.

For homes built over an enclosed crawl space, a plastic ground cover is required. It should be at least 6-mil polyethylene with overlapping joints and cover the entire ground area in the crawl space. Covering the ground surface with 6-mil-thick polyethylene and anchoring it in place will keep moisture from getting into the crawl space from the ground. Be sure the crawl space is well ventilated to keep moisture from building up and damaging building materials.

For homes built on a concrete slab, rigid foam board insulation should be installed around the perimeter of the slab. Slab perimeters should be insulated with rigid insulation at the time of construction. Slabs lose heat at their perimeters because concrete is a fairly good conductor of heat. With no insulation, the temperature difference between the slab and the outside air can be dramatic. Heat loss beneath the slab into the earth is much less severe because ground temperatures are more moderate than the surrounding air temperature. Adding slab insulation requires digging a trench to expose the foundation wall below the frost line, washing the foundation wall, spot-gluing rigid board insulation to the wall with an adhesive then covering the insulation with a protective coating. Although insulation board is optional for homes with concrete slab floors, it is highly recommended for the Touchstone Energy® Home.



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WINDOWS AND DOORS

Windows to the world; windows to efficiency

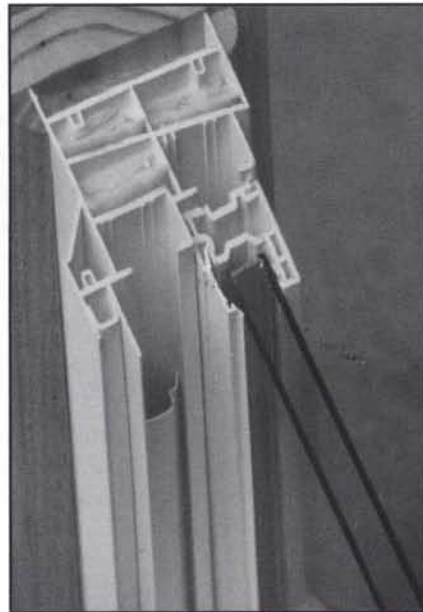
You may have noticed that many new homes feature lots of glass. Pretty to look at, but terrible in terms of overall energy efficiency. But the Touchstone Energy® Home features some standards that make it possible for homeowners to enjoy the beauty of windows without compromising efficiency.

All windows must be double pane with a thermal break between the panes. That thermal break allows heat to be trapped, but not transferred as much into the cooler area.

Another option many homeowners use is "Low-e windows." Low-e, the abbreviation for low emissivity glass, has an invisible, metallic coating that admits the full spectrum of sunlight but blocks radiant heat from escaping. In addition, argon gas fills the space between the panes. Argon allows sunlight to pass through, but it blocks the heat.

During the winter months, between 70 and 75 percent of the heat that would otherwise escape from the house is reflected back into the home for energy savings. Because the coating also increases the inside window's surface temperature, areas near them are more comfortable on cold winter nights. During the cooling season, as much as 25 percent of the unwanted heat that would otherwise enter the house is reflected to the outside. The low-e coating blocks ultraviolet light, which would normally fade fabrics and other materials.

It is highly recommended that any home facing east and west, or a home with 50 percent of the glass exposed to direct sunlight, use low-e windows.

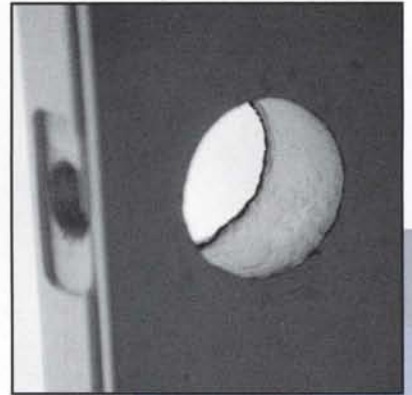


Decorative doors are another popular feature on many new homes. But again, be careful not to compromise efficiency for aesthetics.

Outside doors should be metal with a foam core insulating material inside the door. In addition to having attractive wood-grain finishes, metal doors provide better security, seal more tightly using magnetic weather-stripping and are more sound proof than regular wood doors. With today's technology, these doors can be painted easily and, in some cases, can be stained to resemble wood.

Solid wood doors are allowed in limited usage to qualify as a Touchstone Energy® Home.

Sliding or French-style glass doors should meet the same standards as conventional windows—double pane with a thermal break between the panes of glass.



Outside doors should be metal with a foam core insulating material inside the door. In addition to having attractive wood-grain finishes, metal doors provide better security, seal more tightly using magnetic weather-stripping and are more sound proof than regular wood doors.

All windows must be double pane with a thermal break between the panes. That thermal break allows heat to be trapped, but less transferrable into the cooler area.

INFILTRATION CONTROL

Energy thieves exist throughout your home, but none is more overlooked than air infiltration.

Air infiltration is the simple movement of air into or out of the home through cracks, construction openings and other crevices. That's why blocking infiltration is such a major part of the Touchstone Energy® Home program.

All exterior windows, doorframes and corner joints should be properly caulked or sealed. It is not acceptable to stuff fiberglass insulation around those openings since the compressed material loses much of its insulating ability.

All penetrations through the wall and into the home should be sealed with caulk, gaskets or some other appropriate material. Such openings include, but aren't limited to electrical, cable/satellite television or telephone/internet service entries. Openings for plumbing through the walls or sole plates also should be sealed.

The sole plates themselves—the base between the floor and exterior walls—should be caulked or have a sill sealer installed.

Vapor barriers are materials that restrict the movement of water vapor through the home's envelope. Commonly made of materials like plastic sheets, treated papers and metallic foils, they often come attached to insulation materials. In homes without them, warm

inside air, which contains water vapor, can move into the walls, ceilings and floors and condense, causing serious moisture damage and significant loss of insulating value.

An exterior house wrap is required for a Touchstone Energy® Home. The exterior house wrap not only blocks air infiltration but has the added benefit of soundproofing the home.



Other points to address to block infiltration include:

- Fireplaces—they should have glass fronts or glass fire doors. There should be an outside air source to supply combustion air. Chimneys should have tight-fitting dampers.
- Kitchens and baths—exhaust fans should be installed to help remove moisture from kitchens and baths. These systems should have back draft dampers to prevent heat from being lost when the fans are not in use.
- Recessed lighting—often referred to as “can lights,” recessed fixtures must be airtight and rated for an insulated ceiling to avoid any fire hazard.
- Outlets and switches—surprising amounts of air infiltration come from electrical or telephone outlets along exterior walls. Again, foam gaskets should be inserted underneath the outlet cover to block infiltration.

All penetrations through the wall and into the home should be sealed with caulk, gaskets or some other appropriate material. Such openings include, but aren't limited to electrical, cable/satellite television or telephone/internet service entries.



HEATING, COOLING AND DUCT WORK

The Touchstone Energy® Home requires an electric heat pump for heating and cooling, and an electric water heater for hot water.

When shopping for either, pay attention to the energy efficiency ratings.

Heat pumps are rated with a SEER number, which stands for Seasonal Energy Efficiency Ratio. The higher the SEER, the more efficient the system and, as a result, the lower your operating costs will be for heating and cooling your home.

Heat pumps are sized by tons. That's not a measure of weight, but a measure of how much energy is required to transfer a certain level of heat. For example, the typical 1,800-square-foot home will need about a 3-ton heat pump. When building to Touchstone Energy® Home standards, it may be possible to reduce the size of the unit to 2 1/2 tons, which means lower operating costs without giving up comfort.

Electric heat pumps are basically reversible air conditioners. They move heat from the air in one location to the air in another. In summer, they operate as air conditioners, removing heat from the home. In winter, they reverse their operation, gathering heat from air outside the home and moving it inside. Since heat pumps move rather than generate heat, they can be extremely efficient, delivering more than three times as much heat as they consume in energy. Heat pumps have the additional advantages of providing heating and cooling in one unit using a single energy source.

Look for the highest SEER rating possible for an electric heat pump. Someone from your local Touchstone Energy® System can help calculate how long it would take to recover any increase in costs incurred for purchasing a higher SEER electric heat pump.

Another consideration for installing the electric heating and cooling system is the ductwork. Studies show that ductwork leaks can waste between 20 and 40 percent of the home's heating and cooling dollar.

Materials used to seal ducts should last as long as the ducts themselves. The most commonly used material, cloth duct tape, is not recommended because its adhesive dries out and the tape falls away.

Many foil duct tapes also do not have quality adhesives.

When possible, install ductwork in the home's conditioned space. For example, a tray ceiling would allow ductwork along the perimeter of the room. That way, any heat lost from the ducts is lost into the room being conditioned anyway, so there's less waste.

When it's not possible to install ducts in conditioned space, make sure ducts are insulated and that duct joints are sealed with a mastic to avoid leakage.

The recommended duct sealing materials include duct sealing mastic, UL-181 aluminum tape and high-quality caulking or foam sealant. Mastic is the most effective material to seal all types of ductwork and can be purchased in tubs or caulk tubes. Mastic looks like drywall joint compound and dries in hours. It sticks well to most surfaces and requires little preparation.

The Touchstone Energy® Home standards also require that homes use an electric water heater. Your Touchstone Energy® System will provide you one free. The electric water heater is larger than standard models, has more insulation and features a smaller heating element—all of which combine to make sure you have plenty of hot water and lower your operating costs.



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Comfort. Savings. Efficiency.



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