Lee's Air Conditioning Home Energy Audit:

The costs for residential audits, sometimes called an energy assessment, vary and can depend on everything from how complicated a home's architecture is to how much business competition there is for home energy auditors in your area. Home energy audits tend to range from $300-$500, but they are sometimes subsidized by local governments or utilities. Some contractors will also reduce the costs if you hire them to make the recommended improvements to your house.

This "do-it-yourself" home energy audit will not be as thorough as a professional home energy assessment, but it can help you pinpoint some of the easier areas to address. When walking through your home, keep a checklist of areas you have inspected and problems you found. This list will help you prioritize your energy efficiency upgrades. Do not assume that just because your home is recently constructed–or even new–that there are no opportunities to save energy. Energy-saving technology has evolved rapidly over the past few years, outpacing training commonly available to many builders, including some of the most reputable.

LOCATE AIR LEAKS

First, make a list of obvious air leaks (drafts). The potential energy savings from reducing drafts in a home may range from 5% to 30% per year, and the home is generally much more comfortable afterward.

Check for indoor air leaks, such as gaps along the baseboard or edge of the flooring and at junctures of the walls and ceiling. Also check for leaks on the outside of your home, especially in areas where two different building materials meet. See Detecting Air Leaks for detailed instructions on finding air leaks yourself.

- **Seal Air Leaks**

You should plug and caulk holes or penetrations for faucets, pipes, electric outlets, and wiring. Look for cracks and holes in the mortar, foundation, and siding, and look for leaks around

windows and doors. Seal them with the appropriate material. Learn more about selecting and applying caulk and weatherstripping.

- **Consider Ventilation**

When sealing any home, you must always be aware of the danger of indoor air pollution and combustion appliance "backdrafts." Backdrafting is when the various combustion appliances and exhaust fans in the home compete for air. An exhaust fan may pull the combustion gases back into the living space. This can obviously create a very dangerous and unhealthy situation in the home.

In homes where a fuel is burned (i.e., natural gas, fuel oil, propane, or wood) for heating, be certain the appliance has an adequate air supply. Generally, one square inch of vent opening is required for each 1,000 Btu of appliance input heat. Burn marks or soot around the appliance burner or at the vent collar, or visible smoke anywhere in the utility room while the appliance is operating, indicate poor draft. When in doubt, contact your local utility company, energy professional, or ventilation contractor. Learn more about proper ventilation. Your HVAC professional can help you determine the best method to bring fresh air into your home.

CHECK INSULATION

Heat loss through the ceiling and walls in your home could be very large if the insulation levels are less than the recommended minimum. When your house was built, the builder likely installed the amount of insulation recommended at that time. Given today's energy prices (and future prices that will probably be higher), the level of insulation might be inadequate, especially if you have an older home.

If the attic hatch is located above a conditioned space, check to see if it is at least as heavily insulated as the attic, is weather stripped, and closes tightly. In the attic, determine whether openings for items such as pipes, ductwork, and chimneys are sealed. Seal any gaps with an expanding foam caulk or some other permanent sealant. When you are sealing gaps around chimneys or other heat producing devices, be sure to use a non-combustible sealant. Ask your HVAC advisor about an “attic tent” to seal those drafty attic stairs.

Make sure that the attic vents are not blocked by insulation. You also should seal any electrical boxes in the ceiling with flexible caulk (from the living room side or attic side) and cover the entire attic floor with at least the current recommended amount of insulation. See attached chart for estimating insulation R value.

Checking a wall's insulation level is more difficult. Select an exterior wall and turn off the circuit breaker or unscrew the fuse for any outlets in the wall. Be sure to test the outlets to make certain that they are not "hot." Check the outlet by plugging in a functioning lamp or portable radio. Once you are sure your outlets are not getting any electricity, remove the cover plate from one of the outlets and gently probe into the wall with a thin, long stick or screwdriver. A plastic crochet hook is particularly suited, as it will retrieve small bits of any insulation material for easy identification. If you encounter a slight resistance, you have some insulation there. You could also make a small hole in a closet, behind a couch, or in some other unobtrusive place to see what, if anything, the wall cavity is filled with. Ideally, the wall cavity should be totally filled with some form of insulation material. Unfortunately, this method cannot tell you if the entire wall is insulated, or if the insulation has settled. Only a thermographic inspection can do this.

If your basement or crawlspace is unconditioned and open to the exterior, determine whether there is insulation under the living area flooring. In most areas of the country, an R-value of 25 is the recommended minimum level of insulation. If the sub-space is enclosed and contains heating or cooling appliances, air ducts or plumbing, you should probably insulate the sub-space perimeter rather than the living space floor. The insulation at the top of the foundation wall and first floor perimeter should have an R-value of 19 or greater. If the basement is intentionally conditioned, the foundation walls should also be insulated to at least R-19. Your water heater, hot water pipes, and furnace ducts should all be insulated.

INSPECT HEATING AND COOLING EQUIPMENT

Inspect heating and cooling equipment bi-annually, or as recommended by the manufacturer. If you have a forced-air furnace, check your filters and replace them at least monthly. Have a certified technician check and clean your equipment once a year.

If the unit is more than 15 years old, you should consider replacing your system with one of the newer, energy-efficient units. A new unit would greatly reduce your energy consumption, especially if the existing equipment is in poor condition. Check your ductwork for dirt streaks, especially near seams. These indicate air leaks, and they should be sealed with duct mastic. Insulate any ducts or pipes that travel through unheated spaces. An insulation R-Value of 6 is the recommended minimum. If replacing the ducts, always insist on R8 insulation.

LIGHTING

Energy for lighting accounts for about 10% of your electric bill. Examine the light bulbs in your house and consider replacing inefficient bulbs with a more efficient choice, such as energy-saving incandescents, compact fluorescent lamps (CFLs), or light-emitting diodes (LEDs). When shopping for bulbs, consider the brightness of the bulbs you want and look for lumens and the

Lighting Facts label. Your electric utility may offer rebates or other incentives for purchasing energy-efficient lamps.

APPLIANCES AND ELECTRONICS

The appliances and electronics you choose and how you use them affect your energy use and costs. Examine the appliances and electronics in your home and estimate their energy use. Consider strategies for reducing the energy use of your appliances and electronics.

You might consider the following:

- Unplugging an item when it is not in use to prevent phantom loads
- Changing the settings or using the item less often
- Purchasing a new, more efficient product. Learn more about shopping for efficient appliances and electronics.