Do-It-Yourself (DIY) Home Energy Assessments

In order to identify energy loss in your home, you need to conduct a home energy assessment. If you choose not to hire a trained professional, there is still a lot you can do. By using this checklist to identify problem areas and making energy efficient changes, you can significantly lower your energy use and utility bills. At the end of the assessment, there is a list of simple steps that you can do to save even more energy.

Check for Air Leaks - The potential energy savings from reducing air leaks in a home ranges from 5 to 30% per year. Not only will you save money, but your home will likely feel less drafty and more comfortable after sealing leaks.

Sites for Air Leaks - If your home has leaks, it is likely to be in the following places:

- Electrical Outlets
- Switch Plates
- Window Frames
- Attic Hatches
- Baseboards
- Kitchen Cabinets
- Weather Stripping Around Doors
- Duct Disconnects in the Attic
- Exterior Walls
- Seal return air chases
- Wall – or window – Mounted Air Conditioners
- Fireplace Dampers - are they closed when not in use?
- Caulking and Weather Stripping: Check to see that it is applied properly, leaving no gaps or cracks, and are in good condition.
- On the outside of your house: Inspect all areas where two different building materials meet, looking for cracks and/or gaps, including:
  - All exterior corners
  - Where siding and chimneys meet
  - Areas where the foundation and the bottom of exterior brick or siding meet
- Check for holes or cracks: In and around your walls, ceilings, windows, doors, light and plumbing fixtures, switches, and electrical outlets, pipes and wires, foundation seals, and mail slots that can leak air into or out of your home.

Checking for Air Leaks - Once you know where wire is likely to leak into and out of your home, you need to know how to check for air movement. Check to see if air can flow through the places above using one of these methods:

1. Hold a feather or lightweight piece of string in front of the areas below, if it there is airflow.
2. Look for cobwebs - spiders put their webs where there is air movement.

3. Carefully (avoiding drapes and other flammables) light an incense stick and hold it close to any areas where you suspect an air leak. The smoke will "flutter" where there is leakage.
4. Have someone outside blow a hair dryer around each window while you hold a lighted candle inside. If the candle flickers you need to caulk or weather strip around the frame.
5. After dark, walk around your house and shine a flashlight on places that are likely to have air leaks. Have someone on the inside recording where they see light entering through gaps.
6. In attic, look for dirty insulation, a sign air is leaking and the insulation is filtering air.

Anywhere you feel/see air, cracks, or gaps, use caulking or weather stripping to fill and seal them. If airflow was felt/seen behind electrical outlets and light switch plates, purchase electrical and switch plate insulation pads to place behind the plate.

Insulation

- Attic R-Value: Check the R-value of the insulation in your attic.
- Attic Hatch: If it 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; if not, install an attic "dome" with a high R-value.

- Attic Openings: Check whether openings in the ceiling for items such as pipes, ductwork, and chimneys are sealed. Seal any gaps with an expanding foam, caulk or some other permanent sealant. This may best be done by a professional.
- Attic Vents: Check that the vents to the outside 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).
- Water Heater: If in an attic or garage, or other unconditioned space, make sure your water heater is properly insulated with a water heater blanket. Installation must be in compliance with the manufacturer's instructions.
- Water Pipes: Check to see that exposed water pipes are are insulated – water cools faster in exposed pipes and is therefore re-heated more often, which requires the use of more energy.

Heating and Cooling Equipment

- Forced-air Furnace: Check your filters and replace them when dirty. Generally, you should change them about once every month or two, especially during periods of high usage. Confirm that they are the proper MERV rating for the furnace.
- Equipment Maintenance: Have a professional check, clean, and tune-up your equipment annually.
- Ductwork: First, check your ducts to make sure they are all connected, both to the unit and the other ductwork. Next, 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 insulated spaces. Don't use duct tape.

- Check for unsealed air returns.
- ProgrammableThermostat: Check to see if your thermostat is programmable, and program the temperature to be set higher for air conditioning and lower for heat when no one is going to be home, and during the night when everyone is asleep, but no more than a five degree setback. If you have a heat pump, use a programmable thermostat specifically designed for that type of unit.

Lighting / Electronics / Appliances

- Light Bulb Wattage: Examine the number of watts used by the light bulbs in your house. You may be using 100 watt (or larger) bulbs where 60 or 75 watts would do. Remember, you should purchase light bulbs based on the amount of lumens (or light output) they provide, and not the amount of wattage (or energy) they use. You can get the same amount of light output from a CFL or LED as you can an incandescent bulb — only you will use less energy with a CFL or LED. Replace incandescent light bulbs to compact fluorescent lights or LED's where lights are on for hours at a time.
- Check to make sure all electronics and appliances are plugged in only if they are in use: Even better— use a power strip or smart strip to plug in your electronics and appliances and simply turn off the strip when they are not in use.
- ENERGY STAR rated electronics and appliances. Consider ENERGY STAR electronics and appliances for your next purchase, as they can save on operating costs.
- Refrigerators: Is your refrigerator older than ten years? If so, it will be worth the replacement cost, and get the most efficient one you can, as it runs 24-7. By the way, this applies to the old refrigerator kept in the garage too.

Windows

- Check windows for shade. Exterior trees or awnings are a great idea.
- Consider solar screen and/or films on windows that are not shaded by trees and/or overhangs: The sun's rays entering your house through the windows add considerably to the air conditioning load.

Plumbing

WaterSense low flow showerheads, sink faucets, and toilets conserve water and water heater energy, and save money over time. Replacing an old toilet with a high efficiency model can conserve up to 16,000 gallons of water a year!

Additional Information:

- Compare your home's energy to other similar homes; go to: https://www.energystar.gov/index.cfm?fuseaction=HOME_ENERGY_YARDSTICK.showGetStarted and see how you rate.

- Use the home energy saver website http://hes.lbl.gov/ as an additional resource to your home energy audit; calculate how much you can save by becoming more energy efficient.
- If you want to further improve the efficiency of your home, especially if you have high energy bills or your home is uncomfortable, consider contacting a professional to conduct a home energy audit to diagnose why.
    - Your first step should be to contact your utility to see if they offer free or discounted energy audits to their customers. If not, you can hire a home energy professional, such as a certified Home Energy Rater, to evaluate your home's energy efficiency.
    - Hiring guidelines, what to expect from a home audit, and other tips can be found at Find out more here: http://energy.ces.ncsu.edu/for-consumers/
    - To find a Home Energy Rater, visit the ENERGY STAR for Homes Partner Locator.

Resources:

E-Conservation – North Carolina Cooperative Extension
http://energy.ces.ncsu.edu/ A great resource for DIYs, guidelines, renter resources, rebate and incentive programs, tips, helpful videos, and more.

Resources For Renters - Just because you do not own your home or apartment does not mean you cannot control your residential energy use! http://energy.ces.ncsu.edu/resources-for-renters/

eXtension Home Energy - http://www.extension.org/home_energy

Department of Energy - DOE http://energy.gov/energysaver/articles/do-it-yourself-home-energy-audits

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