



Whitepaper:

Common Home Energy Defects and Their Quick Fixes

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This whitepaper is intended to help clients understand common defects found during standard residential home inspections that have an impact on energy bills and how to quickly and economically fix those defects. Following the article is a reference page with links to information about energy saving tips, DIY projects and government energy programs.

Poor Attic Insulation

Inadequate or poorly distributed attic insulation is a common defect that has a substantial impact on a home's energy use. It is estimated that a home loses 15-25% of its energy through the attic space. In hotter climates that estimate can even be much higher because roof temperatures are accelerated and therefore inbound more heat into the ceiling cavity of the home. Adequacy of insulation is truly a judgment call; newer construction practices have raised the bar considerably on what is considered adequate.

It should be noted that a home inspector's ability to assess the presence or absence of insulation and its adequacy is limited to readily visible and accessible areas.

Simple fixes: During the summer, attic temperatures are routinely much hotter than the temperature in the living space of the home. A simple fix is to make sure that the attic scuttle door (access panel to the attic) is constructed of a minimum 5/8" drywall panel that is fitted with weather stripping on all four sides for a tight seal. Place a properly sized fiberglass batt on top of the attic scuttle board to help insulate the scuttle board and the perimeter. Attic scuttle openings are a common source of heat gain into the home's interior.

Gaps in Doors and Windows

Gaps at the bottom of doors and poorly sealed window frames (i.e. openings potentially visible at the exterior or interior) are common culprits of energy loss. This is especially true with entry doors as the space they cover is large and they're frequently in use. Inadequate weather stripping on doors and windows also allows the intrusion of hot air into the home (hot air moves towards cold, so cold air doesn't actually 'leak' out of a home as some might think).

ENERGY STAR estimates that homeowners can save up to 20% on their heating and cooling costs (or up to 10% on their total annual energy bill) by sealing and insulating doors and windows.

Simple fixes: Place a bright light on the exterior of a door when it is night time. Go to the interior side of the door opposite the light and see if you can see the light shining through any openings at the sides, top or bottom of the door. If you can see openings, the weather stripping is inadequate in that spot and the door leaks energy. Visit your local hardware store and pick up the right weather stripping for the job.

Garage Spaces

People often overlook the garage as a potential candidate for energy related improvements, but there are two main issues commonly found in this space.

First, the bottom weather seal on garage doors are often poorly fitted or damaged, allowing heat to enter the garage space.

The second area of concern is the door between the house and an attached garage. This door should be fire-rated (a special solid door with a tag on it) and self closing (it must be self-closing to maintain the fire rating of the garage). Many people disable the self closing mechanism because they don't want to be bothered with continuously opening and closing the door (such as when bringing in groceries). However, if these doors stay open, hot air from the garage – now increased by the car's heat – will come into the cool house.

Simple fixes: Replace the weather seal on the garage door making sure that the seal fits tight to the concrete when the door is in the down position. Maintain the integrity of the fire-rated door between the home and garage and ensure the complete closure of the door after it opens it by adjusting the self-closing mechanism so that the door fully closes each time it is opened. If you desire to be able to keep the door in an open position for a period of time, use a doorstop.

Incandescent Bulbs

Incandescent bulbs are a safety hazard and energy thief often missed by poorly trained inspectors. Open bulbs generate high enough heat to ignite flammable objects, therefore presenting a fire risk, especially in closets where sweaters, boxes or other flammable materials may reside. They also use a large amount of energy relative to their light output.

Simple fixes: Replace incandescent bulbs with much cooler burning compact fluorescent bulbs. The newer bulbs are available at home improvement centers. Read labels carefully.

Air Ducts

Blocked air ducts or holes, gaps or separations in the plenum (upper vent bonnet) or ductwork of air handlers/furnaces and air distribution systems allow cold air to leak out. This cold air never reaches the intended living spaces. Instead, the cold air winds up in the basement or attic.

Simple fixes: Duct mastic is the best solution for this problem. Available at home centers, duct mastic is contact cement that seals openings better than (you guessed it) duct tape. Duct tape will lose its seal after a period of time due to temperature changes.

Air Conditioners

Air conditioners that are beyond their estimated service life are more prone to inefficient cooling and are not as energy efficient as newer models. While still performing their intended function, replacement can have a significant impact on energy bills.

In addition, while some form of shrubbery around the outdoor unit can provide valuable shade that helps it run at optimal performance, excessive landscaping too close to the unit can block air flow and inhibit performance.

Simple fixes: Remove excess landscaping around the outdoor air conditioning unit. Construct a simple shade from PVC piping and ready-made tarp with pre-punched grommets. Place the tarp on the top of the PVC frame so that the AC unit is shaded but air flow is not restricted to the coils or at the fan. Reducing the amount of sun on the unit itself will help to reduce your energy bills.

Thermostats

As part of the home inspection, an inspector will test the heating, ventilation and air conditioning system. The inspector will also observe the location and operation of the thermostat. A properly located working thermostat is critical to maintaining a comfortable indoor climate while regulating energy costs.

If a thermostat is improperly located, for example on a dead wall in a hallway versus in an open hallway, the thermostat may interpret the area to be hot and therefore trigger the air conditioning to turn on even when the living spaces, such as bedrooms, are actually cool.

Simple fixes: Carefully evaluate your thermostat. Is it in the proper location? If not, consider relocating it or placing a ceiling fan in that hallway to properly distribute air near the thermostat. Is the thermostat a digital, programmable model? If not, replace it with a programmable model that includes a timer. Set the timer to bring the house to your desired temperature one hour before you return home from work. Programmable thermostats typically save 9-11% on energy costs. Thermostats are fairly easy to install. Purchase one at your local home improvement center and follow directions exactly.

[Please refer to the next page for links to useful resources.]

Links to Further Information

Alliance to Save Energy - <http://ase.org/>

California Energy Commission – Summer Energy Saving Tips -
<http://www.consumerenergycenter.org/tips/summer.html>

Energy Star – A Do-It-Yourself Guide to Sealing & Insulating -
http://www.energystar.gov/index.cfm?c=diy.diy_index

Home TuneUp® – Home Energy Audits - <http://www.hometuneup.com/>

U.S. Department of Energy – Consumer Energy Saving Tips for Homes and Cars -
<http://www.energy.gov/forconsumers.htm>

U.S. Department of Energy – Energy Efficiency & Renewable Energy Information
Center - <https://www1.eere.energy.gov/informationcenter/>

U.S. Department of Energy – Government Programs and Tax Breaks -
<http://www.energy.gov/recovery/>