



## Things to Know About A Home Energy Audit

A home energy audit with SmartHouse is a smart first step toward improving the energy efficiency, comfort, health, safety and durability of your home. You can expect your home's energy audit to result in information that will help you achieve your goals in the most strategic and cost-effective way possible. The information we learn about your home will enable us to make informed suggestions as to where you should and should not invest your improvement dollars.

### Why People Choose A Home Energy Audit

There are lots of reason to choose a Home Energy Audit. Most frequently, we're contacted by customers who are interested in:

#### **More Comfortable Rooms**

Many homeowners suffer with drafts, rooms that don't heat or cool properly, uneven temperatures and cold floors. Too often, people just accept this discomfort because they don't know who to call. By utilizing the information obtained through the energy audit process, we can prescribe and install a cure for these problems.



#### **Improved Energy Efficiency**



Most homes waste a huge amount of energy, resulting in hundreds, possibly thousands, of dollars being wasted each year. A more efficient home requires less energy to keep you warm in the winter and cool in the summer.

#### **Healthier Indoor Air Quality**

For many people, indoor air quality is a big concern. If you have asthma or allergies, the air quality inside your home has a big effect on the quality of your daily life.



#### **Moisture Control**



Moisture issues can show up in a variety of ways; condensation on windows, brown spots and wet drywall on shower areas that don't vent fully are all examples. Uncontrolled moisture can create mold and eat away at the structure of your home. In addition to durability issues, moisture can also create significant indoor air quality challenges.

## Being a Friend to our Planet

With houses consuming more than 20% of our nation's energy and representing more than 60% of the energy consumed by an individual, there are some big reasons to look at houses as a place to save energy. The good news is, there are a lot of very cost-effective ways to drive big energy savings in nearly any home. Making your home more energy efficient not only lowers your utility bills and improves your quality of life, it is friendlier to the environment



## Making Your Home More Desirable



Home buyers are becoming more and more sophisticated and are starting to realize the true cost of home ownership is more than just the mortgage payment – it definitely includes utility bills. By engaging in the Home Performance Improvement process, you're not only improving the comfort and efficiency of your home, but are also creating a distinct competitive advantage which can improve the selling price of your home, as well as the speed in which it sells.

## Why People Choose SmartHouse



### Our Mission & Values

A business is only as good as the foundation it's built on. By publishing and living our values, we ensure our team members put all their attention in the right place...you and your home!

A more comfortable, energy efficient home. **GUARANTEED!**

#### WHAT WE DO

We perform energy audits and use specialized construction methods to help homeowners achieve improvements to the energy efficiency, comfort and health of their home. Our work makes economic sense (lower utility bills & higher property value), improves life quality, solves home problems (like drafts & cold rooms) and helps our planet by reducing energy use.



#### OUR VALUES

- Our customers always come first.
- We are fair & honest in all our dealings.
- Our recommendations are driven by building science, not sales goals.
- We strive to learn continuously.
- We are prompt, clean, courteous and respectful.
- We strive to be an employer of choice for talented trades-people.
- We lead by example.

## Who's Behind Us

### HOME Performance with ENERGY STAR (HPwES)



ENERGY STAR is one of the most trusted names in promoting energy efficiency, while maintaining a high quality of value and helping to protect the environment. The Energy Star program developed HPwES to give **homeowners confidence** that participating contractors follow industry best practices to address homeowners' concerns.

SmartHouse is St. Louis' leading area contractor for the HPwES program. Our membership in this program, together with our extensive experience (more than 3x as many home audits as every other St. Louis area Energy Auditor COMBINED!), is your assurance of receiving a complete, valid and informative home assessment.

### Missouri Botanical Gardens' EarthWays Center – Our Local HPwES Sponsor

The local HPwES sponsor provides a number of benefits and assurances to the homeowner, including subjecting a certain percentage of our jobs to random field-testing, to provide an added level of quality assurance. The local HPwES sponsor may also ask for your opinions about our work, so we know where we are doing well and where we can improve. We work closely with our HPwES sponsor to provide quality inspections, recommendations and whole house improvements.



The SmartHouse team member performing your Home Energy Audit is a Home Performance Specialist. All of our specialists are Energy Auditors registered with the *Missouri Department of Energy*, and certified by the *Building Performance Institute* (BPI), a nationally recognized training, certification and accreditation body.

Our Home Performance Specialists are experts in building science who understand how energy, moisture and air move throughout your home. Using diagnostic tools, including blower doors, thermal imaging cameras, combustion analyzers and more, we'll look at your whole house, with an understanding of how insulation levels, air leakage, windows and mechanical systems all interact to effect your home's comfort, energy usage, indoor air quality and durability.

Looking at your home holistically enables us to create custom solutions tailored to your home's characteristics and your particular needs. We'll make recommendations that are thoughtful, accurate, effective and supported by building science, without any agenda to sell a particular product.

### The Energy Audit Process

The Energy Audit follows a protocol using specific test equipment and methods, but that's where the standardization ends. The fact is, every house is different. Our Home Performance Specialists use their equipment and training to understand how your particular house is built, how it works, how its systems interact and what can be done to move you toward your goals.

Upon arriving, we'll have a lot of questions for you about your experiences in your home. We'll want to know your motivation for ordering the audit and what you hope to achieve. Now is the time to tell us about...

- Warm rooms, cold rooms, drafts, cold floors
- Moisture issues (mold, mildew, wet windows, etc.)
- Any thoughts or plans for remodeling or improvements

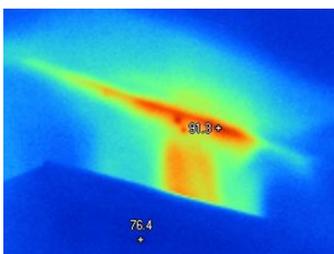


Next comes a tour of your home. We'll ask you to take us everywhere and tell us about any issues or concerns you have. During the tour, we are assessing how the house was built and renovated over the years and if we can see some clues about the concerns you are discussing. Finally, you will notice us opening EVERY interior door. This "sets up" the house for the blower door test. Please leave the doors open during the testing.

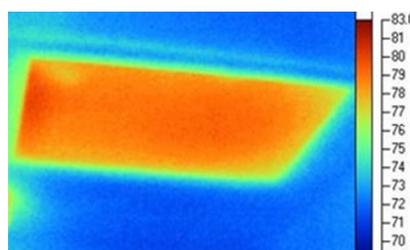


The **BLOWER DOOR** is a powerful fan that fits into an exterior doorway. It expels air to depressurize your house to a pre-determined pressure level. The computer attached to the blower door calculates the air volume needed to achieve that pressure drop to quantify leakage. We then compare the leakage volume with the total air volume of your home to determine how much opportunity there is to make improvements. While primarily used to guide us in *reducing* air leakage, the blower door also helps to assure that your house receives *enough* fresh air. In addition to measuring leakage, the blower door serves as a tool to help us find the leaks. When the air is blown out by the fan, it causes an equal volume of replacement air to leak in through holes, cracks, etc.

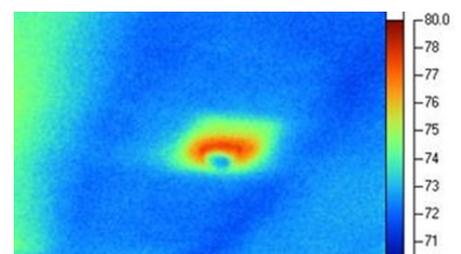
The **THERMAL IMAGING CAMERA** allows us to see this air as it leaks in, thus allowing us to identify the point of entry and devise a strategy to stop that leak. These thermal images allow us to "see through" the walls, to understand things about your home which can't be explored using conventional methods.



Attic air being sucked down a wall cavity by the air conditioner.



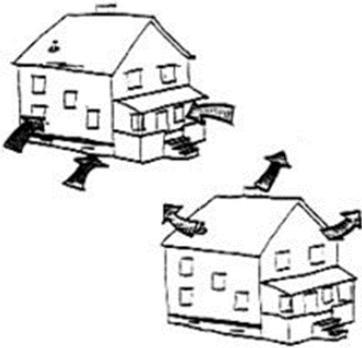
An attic access panel. The red color indicates a huge amount of heat/energy transferring between the house and the attic.



Recessed lights, while wonderful for lighting, allow significant energy loss if not properly insulated.

## Why Air Leaks Matter....

Many people believe adding a bunch of insulation will make a house more energy efficient. While that WILL reduce conductive heat loss, the fact is, **MOST ENERGY LOSS IS CAUSED BY AIR LEAKS.**



Look at the houses to the left. On a cold day, heated air escapes through the top of the house through a variety of gaps (bottom picture.) Then cold air leaks (typically into the basement) to replace the air that leaks out (top picture).

For every cubic foot of warm indoor air that escapes, a cubic foot of cold outdoor air infiltrates and must be heated by your furnace. YOU PAY OVER AND OVER AGAIN to heat that leaked air. Considering many houses leak between 150,000 – 200,000 cubic feet of air each day, that’s a lot of wasted heating.

The most important thing to note is that **INSULATION DOES NOT STOP AIR LEAKS.** Only finding the leak and applying proper air sealing techniques will get the job done. Then, apply a blanket of insulation and you’re all set to start saving money.

## FURNACE and AC EVALUATION

After evaluating your entire house for air leakage, we’ll turn to your mechanical systems and record the efficiency level, age and state of repair of your heating, cooling & water heating appliances. By collecting this information, we’re able to provide meaningful guidance on when to replace systems and what type of systems to buy when the time comes.



## COMBUSTION SAFETY ANALYSIS

Your home will be evaluated for combustion safety and testing will be performed, if needed. Combustion gases SHOULD be vented out of your home, but sometimes if the house is too “tight”, flue gases won’t have enough supply air present to properly exhaust the gases out of the home. With our testing, we’re able to confirm your combustion appliances are operating safely, and if not, make the proper recommendation for your home.

## DUCT LEAKAGE

During the energy audit, all accessible ductwork will be visually inspected for evidence of leakage, such as uninsulated ducts, tears, or improper connections. Lack of proper air flow from leaky ducts results in uncomfortable rooms, not to mention the money wasted to condition air that is not getting where you need it.

## WINDOWS and DOORS

We will assess all windows and doors, using a thermal camera where appropriate, to identify any areas of air leakage and if found, make recommendations to decrease energy loss.



## BATHROOM EXHAUST FANS

Does it seem like your bathroom fan makes a lot of noise but moves little air? This is a common problem in homes because most bath fans are improperly installed and vented. Even when they are moving the air, too often the air is vented inside the attic rather than being properly brought to the outside. We'll inspect your exhaust fans' installation and venting.



## INSULATION



Insulation is an important part of the energy & comfort equation and may be present in your attic, basement, walls and crawlspace. The detail work in installing insulation is often more important than the quantity installed. We'll determine the type and amount of insulation present and, perhaps more importantly, we'll look at how it's been installed.

## Reporting & Improvement Plan

When we're done with the energy audit, we'll prepare a written summary of our findings and include a list of recommendations for how you can achieve your goals for improved comfort and energy efficiency. We'll also provide price quotes for accomplishing any of the improvements our team is able to complete. For needed improvements that are outside our scope of work, we'll provide recommendations to trusted trade contractors in the area.

## COMMON IMPROVEMENTS

Perhaps the greatest value of an energy audit is it treats your home as the unique structure it is. When we arrive, we have no idea what we'll recommend and find ourselves amazed daily by how different our recommendations can be for two similarly appearing houses! And even though a recommendation such as "air sealing" may show up frequently, the magic of the energy audit is that the materials, quantity, location and method of installation will all be custom tailored to address your home's challenges and for achieving your goals. That said, there are some common improvements that show up as recommendations for many homes:

### AIR SEALING

Many air leaks in homes are fairly obvious, such as around windows, doors and electrical outlets. But others, like those in attic, around chimneys and through recessed lighting fixtures, are often the more significant sources of energy loss in a home. Sealing air leaks is critical to improving the overall efficiency of your home and will make your heating and cooling system perform better.

### ADDING INSULATION

Along with air sealing, we may recommend you add insulation. Many homes, both old and new, are not well insulated and some have no insulation at all. Properly installed insulation in walls, floors, attics, basements and crawlspaces provide for more even temperatures throughout the house and results in a quieter, more comfortable living environment that is easier to heat and cool.



## SEALING DUCTWORK



Many homes also have leaky ductwork and poor airflow resulting in stuffy, uncomfortable rooms – regardless of the thermostat setting. We may recommend sealing your accessible ductwork with mastic and balancing the duct system to optimize airflow to all rooms. Insulated ductwork in certain attic, crawlspace and basement situations can also help to ensure your home will be more comfortable.

## IMPROVING HEATING & COOLING SYSTEM

We'll review your heating and air conditioning equipment and determine if it would be cost effective to upgrade to a higher efficiency model. This is especially valuable considering many older systems can waste as much as 40 cents of every gas dollar consumed. You'll find the information we provide to be objective and useful to you in making smart decision on what type of system is best for your home.



## After the Improvements



It's not unusual for our clients to comment that their home feels different from the moment the improvement work is complete. This is especially true for improvements that are aimed at comfort issues. Depending on the work that was done, you might notice your home has fewer drafts plus more consistent temperatures from room to room. Hopefully, you will also see reductions in your utility bills in the months and years to come. Depending on the improvements you

selected for your home, we may return after the job is complete to assure the completed work has been effective. For homes that required significant air sealing, our return visit may include a blower door test to confirm the air leakage has been reduced.

## WRAP UP

We hope you feel there is a benefit for choosing the “Home Performance” approach to advancing your comfort and energy efficiency goals. We believe looking at your home as a series of components working together is the smart approach, which will result in a more strategic, effective and economical set of improvements. We invite you to contact us anytime with questions or to schedule your home energy audit. We look forward to the opportunity to work with you!

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