

# Home Energy Audit Basics

□ Gemma Alexander □ January 24, 2019



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Perhaps you've noticed an insert in your energy bill or received a flyer from your utility company offering discounts or rebates for a home energy audit. It's easy to see the benefit in upgrading to a newer, more efficient water heater or furnace. But why would anyone want to pay to get audited? Once you've read this introduction to energy audit basics, home energy will never remind you of the IRS again.

## What Is a Home Energy Audit?

When you get audited by the IRS, they are looking for things you've done wrong, and any mistakes they find are bound to cost you money. A home energy audit will help you find the most effective ways to do better, and any improvements they find will probably save you money. Also known as a home energy assessment, home energy audits present a comprehensive view of your home's energy use. A thorough audit will include a blower door test and thermographic scan. Every room of the house will be examined, and past utility bills will be reviewed. Audits will provide a home energy score on a scale of one to ten, but will also give detailed analysis to help you understand how where all that energy is going.





THERMOGRAPHY — OR INFRARED SCANNING — DETECTS BUILDING AIR LEAKAGE. PHOTO: ADOBE STOCK

## Why Get a Home Energy Audit?

Everyone knows that insulation, double-pane windows, and a good furnace contribute to a home's overall energy efficiency. An audit will maximize your return on investment by telling you which of those things will have the most impact on your specific house. Knowing where your own energy use is most inefficient will help you prioritize home improvements. Depending on the age and size of your home, as well as the types of heating and cooling you use, you could save between 5 percent and 30 percent on your energy bill by following the recommendations in your home energy audit.



# Energy Saver 101: Home Energy Audits

Take the first step to improving your home's energy efficiency: get a home energy audit.



## What is a home energy audit?

A home energy audit helps you pinpoint where your house is losing energy and **what you can do to save money**. A home energy auditor will also assess health and safety issues that might exist in your home.

The audit involves two parts: the **home assessment** and **analysis** using computer software.



You could **save 5 to 30 percent** on your energy bill by making efficiency upgrades identified in your home energy audit.

## The Auditor's Toolbox

Below are some the tools energy auditors use to inspect a home's energy use.



### Telescoping ladder

To reach into an attic or up high



### Infrared camera

To help determine air leakage and insulation



### Soap bubbles

Used to confirm fuel leaks in combustion appliances



### Screwdrivers, pliers and adjustable wrench

To remove outlet plates and inspect appliances



### Combustion analyzer

Tool designed to sample flue gases in vented combustion appliances and measure flue gas temperature, leaks and carbon monoxide



### Digital probe thermometer

For testing temperature rise in heating equipment and fan operating temperatures



### 25-foot tape measure

For making a footprint sketch of the house



### Blower door

A large fan that depressurizes the home by sucking air out. This test simulates the effect of a 20-mph-per-hour wind to allow the auditor to find air leaks



### Inspection Mirror

To see into constricted spaces



### Flashlight and batteries

To help see behind appliances



### Manometer

A gauge that measures the differences in pressure in a home to pinpoint air leakage and test exhaust devices for proper operation



### Draft gauge

To test for chimney drafts



### Digital camera

To help see into hard-to-reach places and document elements of the house



### Smoke generating device

Produces a thin stream of smoke or non-toxic fog to help find air leakage and duct leakage



### Moisture meter

Measures moisture level in wood and other materials



### Pen and paper

For taking notes



### Watt meter

Measures the electrical energy used by various devices throughout the home



## The Home Energy Audit Checklist

Certified home energy auditors should go through the following steps in a home energy audit.

1

Analyze past year's fuel bills to determine base energy consumption

6

Interior visual inspection

2

Interview the homeowner to learn about problems and how the home operates

7

Assess electrical system for safety concerns

3 Explain the audit process

4 Conduct exterior inspection

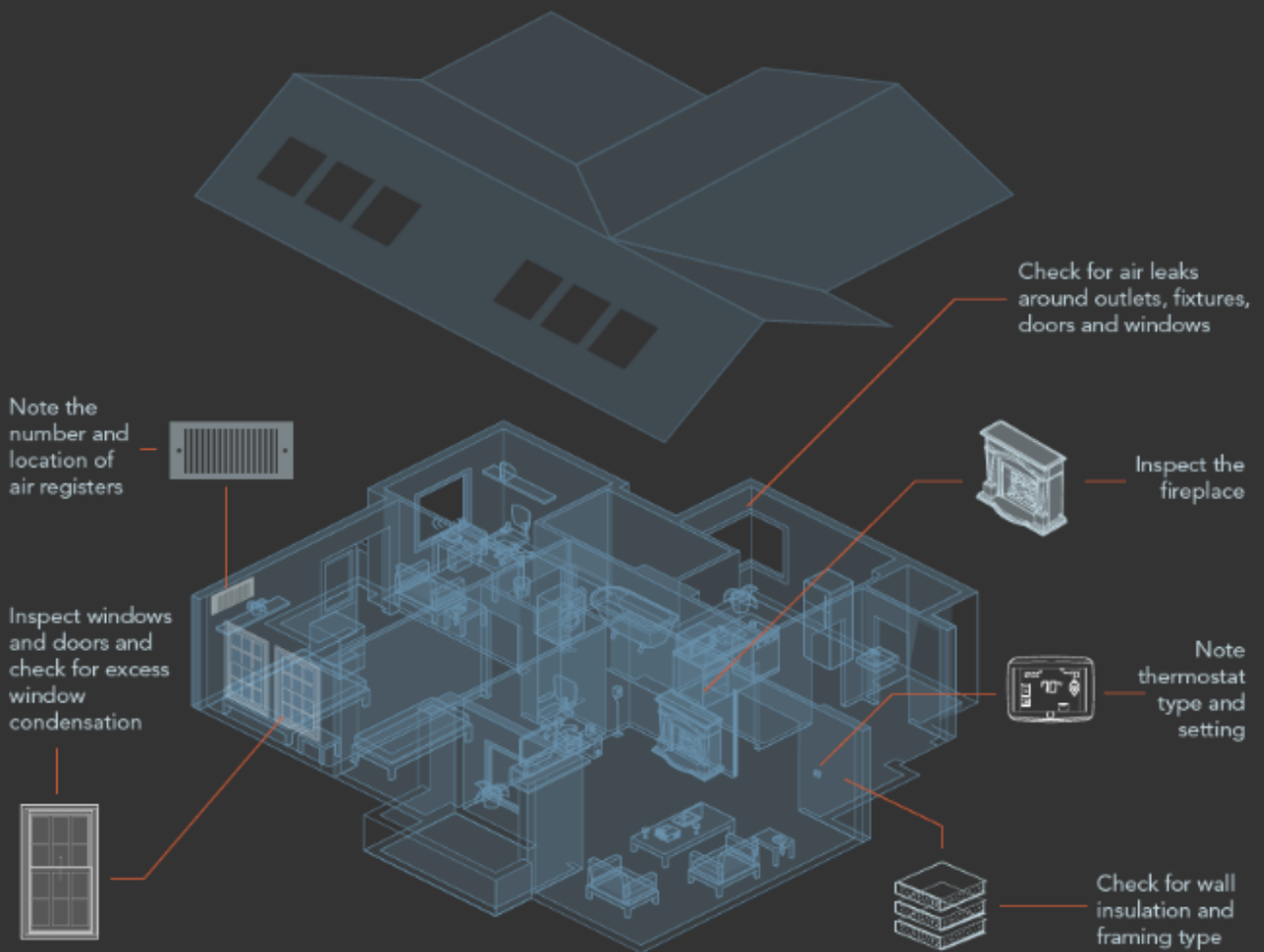
5 Health and safety inspection


8 Combustion appliance inspection


9 Blower door test


10 Analyze findings & create a comprehensive home energy report

# Home Energy Audit: What to Look For



 Note and test smoke & carbon monoxide detectors

 Inspect lighting fixtures and recessed lights

 Look for indoor air quality problems and lead-based paint



### Attic

- Inspect insulation
- Check for major air leakage issues in places like chimney bypasses, recessed lighting and HVAC ducts
- Inspect wiring for safety issues
- Note any signs of water leakage



### Basement & Utility Room

- Furnace: Test for fuel leaks, change the furnace filter, clean the furnace blower
- Water heater: Note thermostat setting and insulation on tank and piping; test draft hood
- Perform Combustion Appliance Zone Testing on all combustible fuel fired appliances
- Inspect duct system and dryer venting



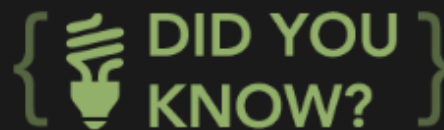
### Kitchen/Bathroom

- Look for electrical or other hazards
- Assess electrical appliance energy use with a watt meter or manufacturer nameplate
- Check for moisture and excess water vapor
- Assess vent fans for flow rate

## What is the Blower Door Test?



A blower door test locates air leaks by using a special fan to depressurize a house. Blower tests are conducted before and after air sealing to measure the effectiveness of the work.



The average home has enough air leakage to add up to a two-foot-square hole. That's like leaving a medium-sized window wide open 24 hours a day.



## MYTHBUSTING Infrared Imaging



**Infrared cannot see through objects or air.**  
It can only see temperatures with cold objects appearing darker.

**Infrared doesn't see color.**  
The color is computer generated to make the difference in temperature.

**Infrared imaging should not be the only tool an energy auditor uses.**  
When used during a blower door test, infrared

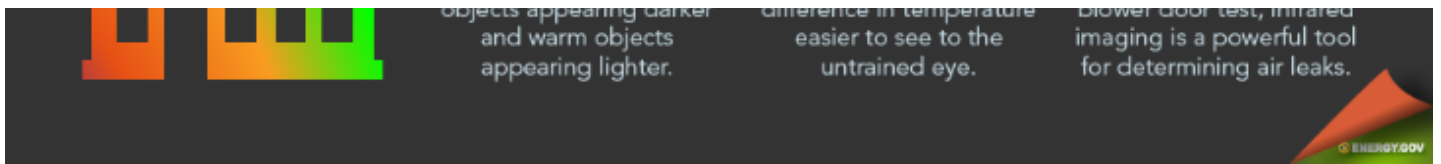


IMAGE: ENERGY.GOV

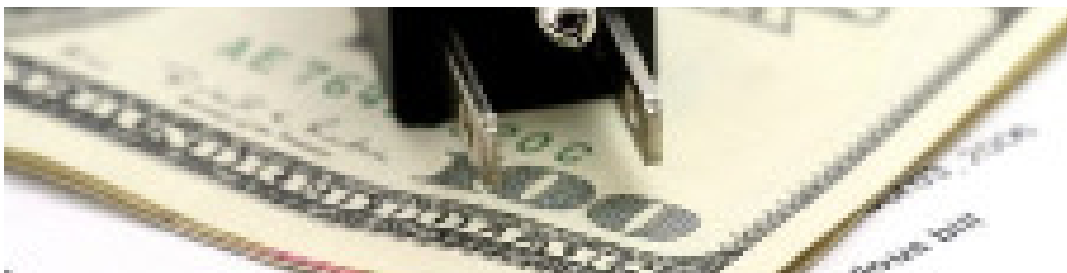
## How Do I Get a Home Energy Audit?

Start with your utility provider. Many utility companies offer customers free or discounted audits, or at least provide a list of recommended providers. Your utility company may also offer rebates or low-cost financing for implementing many of the efficiency improvements your auditor recommends. Even if they don't offer incentives directly, they should be able to refer you to a state program.

If your utility company doesn't provide audits or referrals, you can find a professional auditor from the Building Performance Institute or the Residential Energy Services Network.

Even with rebates, a home energy audit can cost hundreds of dollars. If that's not in your budget, you can perform your own DIY audit. You may not have access to blower door tests or thermographic scanning, but you can identify some efficiencies yourself. Without the upfront cost of the audit, you might have the funds to make some of the improvements right away.

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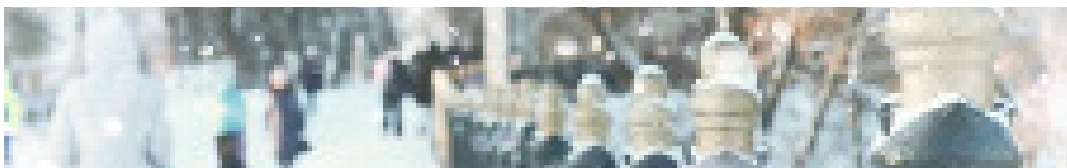
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### Gemma Alexander

Gemma Alexander has an M.S. in urban horticulture and a backyard filled with native plants. After working in a genetics laboratory and at a landfill, she now writes about the environment, the arts and family. See more of her writing [here](#).