

Energy Auditors

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Heating or cooling a building to a comfortable temperature requires energy. Many buildings leak air to the outside environment, causing buildings to lose this energy. To compensate for the lost heat or air-conditioning, building systems produce excess heated or cooled air, which wastes more energy.

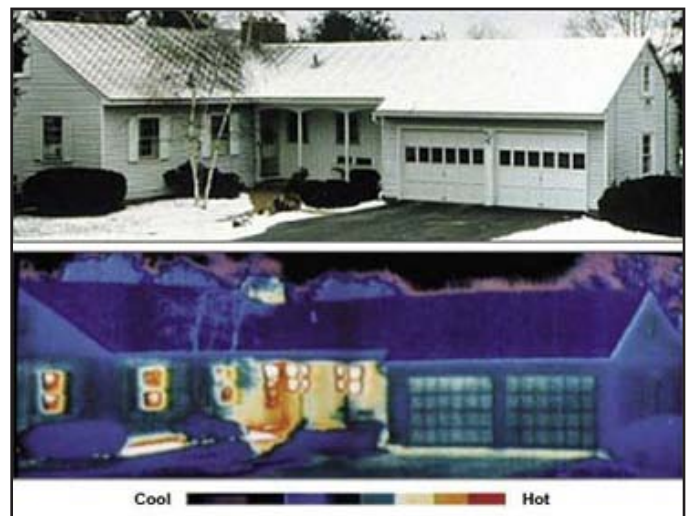
Energy auditors, also known as energy raters or energy consultants, help prevent this waste by inspecting buildings to find areas of air leakage and advising customers on how to fix and prevent leaks. In this way, energy auditors help consumers use fewer resources and save money. Some energy auditors work full time for utility companies that offer energy audits as a service to their customers. Others are self-employed and are hired directly by homeowners or commercial building owners to perform audits. Some conduct energy audits part time while maintaining another career.

By reducing energy waste, auditors lower overall energy consumption, which benefits the environment. Producing energy from coal or nuclear power has environmental costs and creates hazardous by-products. Even renewable sources of energy, such as wind or solar power, can require large, environmentally disruptive construction projects. By increasing energy efficiency, auditors help to lower demand for energy.

Energy auditors also help building owners save money. Building owners pay the bill for any energy the building consumes, whether it's used effectively or

wasted. Unnecessary energy expenditures can be significant in large buildings or buildings that lack energy efficient technologies, such as proper insulation or fluorescent light bulbs. By identifying problem areas and proposing solutions, energy auditors can help building owners lower their energy bills. Over time, these savings more than make up for the cost of the energy audit.

The Bureau of Labor Statistics (BLS) does not currently have employment or wage data specifically for energy auditors. However, BLS is in the process of collecting data to measure green jobs, including those jobs relevant to energy efficiency. Green jobs data are expected to be available in late 2012. For more information on BLS green jobs initiatives, please see www.bls.gov/green.



Standard and thermographic images of a house: the lighter colors (yellow, orange, and red) in the lower image show the house's areas of greatest heat loss

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Walk-through of an audit

Energy auditors conduct audits in homes and commercial buildings. Audits usually begin with a thorough review of the customer's utility bills. The bills give auditors an idea of the customer's typical energy use. Auditors then advise customers on how best to conserve energy and save money.

Most of an energy audit is performed through on-site inspections. Energy auditors use a variety of tests and tools to perform inspections. They choose which tests and tools to use depending on the characteristics of the building being audited.

One of the most common inspection tests is the blower-door test. To conduct the test, energy auditors close all of the building's windows and open all interior doors. Fireplace dampers and most exterior doors are also closed. Only one exterior door is left open, and the auditors install a large fan in the door frame. The rest of the doorway surrounding the fan is sealed off with a material impermeable to air. When the fan is turned on, it blows air out of the building, lowering the internal air pressure. This change causes the air pressure in the building to be lower than it is outside. Air flows from high pressures to low pressures, and unbalancing the pressure between the interior and exterior of the building makes leaks significantly more noticeable. Auditors can use this imbalance to find leaks, where the outside air flows into the low-pressured building.

When conducting a blower-door test, energy auditors frequently find leaks using smoke pens, which emit small puffs of smoke to show air movement. If the smoke pen is held near a leak, its smoke will visibly react to the air flowing in or out. Smoke pens are frequently used to search for leaks in unexpected places, such as light fixture casings, that most building owners would not suspect to be a source of a leak.

To spot leaks, energy auditors conduct thermographic inspections. They examine the building's exterior and interior walls with infrared cameras, which allow auditors to "see" temperatures. Through the lens of an infrared camera, warmer temperatures appear as lighter colors and cooler temperatures appear as darker colors, making it easy for energy auditors to spot changes in temperature caused by leaks. Thermographic inspections are frequently conducted simultaneously with blower-door tests to maximize air flow. Old windows are a frequent source of leaks, and, after conducting a thermographic scan, auditors might recommend that clients purchase

new windows with double-paned glass to mitigate heat energy loss.

Poor insulation is also a common culprit of energy loss. Insulation can be made from many different materials, and some materials are more insulating than others. Insulation's effectiveness is evaluated with a number called an R-value, and materials with greater insulating capabilities have a higher R-value. In some cases, auditors might suggest that clients install insulation with a higher R-value to reduce energy loss.

Even if the insulation in a building has a high R-value, the insulation might still be a source of energy loss. Insulation that is poorly installed, eroded, or pulling away from pipes or walls does little to prevent energy from escaping. When conducting inspections, energy auditors check many places where insulation might be compromised, such as attics, basements, and around pipes.

Some energy auditors are knowledgeable about heating and ventilation systems. When conducting inspections, these auditors usually check the heat pump, furnace, air filter, air conditioners, and other building



Energy auditor conducting blower-door test

systems to ensure that they are working properly. If auditors find an inefficient or older model, they might provide building owners with advice on purchasing a new one.

After they've completed their inspection, energy auditors provide building owners with detailed reports of the tests and their results. Auditors then walk through a building with the owners, pointing out areas with leaks or deficient insulation. Energy auditors also give building owners general advice on the best ways to lower their energy consumption.

Credentials

There are no nationwide education or training requirements for energy auditors, but some states require prospective auditors to take courses or earn certification. Even when it is not required, however, certification can improve an auditor's chance of getting a job. Certification is available through organizations such as the Building Performance Institute, the Residential Energy Services Network, and the Association of Energy Engineers. Some local technical and community colleges also offer courses in energy auditing.

Courses in energy auditing vary among programs, but schools usually offer classes that include demonstrations of common building inspection techniques, such as the blower-door test and thermographic inspections. Students might practice these skills in mock inspections, receive instruction in energy management principles, and learn basic construction and insulation techniques.

Important qualities

Energy auditors should have an interest in environmental and conservation issues. They also should be skillful communicators, because much of their time is spent working directly with clients. When they are not conducting inspections, some energy auditors work with members of their local community to increase awareness of energy issues. These auditors might offer simple clinics in energy efficiency or share tips to decrease energy waste.

Energy auditors must be physically active. They may spend much of the day on their feet, and their inspections may require them to fit in tight spaces, such as attics and crawl spaces, and work on their hands and knees.

Self-employed energy auditors should know basic business and marketing practices in order to run their own companies.

Conclusion

By increasing a building's energy efficiency, energy auditors can create a cleaner environment and help customers save money. As long as they are able to produce financial savings for their clients, energy auditors should find continued demand for their skills. As more home and building owners recognize the benefits of energy audits, the number of auditors will likely grow. The lack of education and training requirements to become an energy auditor provides an excellent opportunity for workers without a college degree.



Energy auditor checking insulation around pipes
(Photo courtesy of United Cooperative Services)