

# A Quest for an Energy-Efficient House

## We Undertake Four Home 'Audits'; The Pros vs. DIY

By [JANE HODGES](#)

Preventing energy waste has become a household preoccupation in the era of nearly \$4-a-gallon gas and rising prices for everything from airline tickets to milk. Whether motivated by environmental impulses or a desire to reduce utility bills, many Americans are researching ways to create a more energy-efficient home.

Statistics from a range of sources provide plenty of motivation. The U.S. Department of Energy's office of Energy Efficiency and Renewable Energy (EERE) estimates that draft reduction within a home can lower energy costs anywhere from 5% to 30% annually. Meanwhile, according to Department of Energy data provided by the U.S. Green Building Council, homes account for 21% of U.S. carbon dioxide emissions. And claiming a green home remodel makes for great neighborhood bragging rights.

Eager to lessen our carbon footprint and plan a responsible remodel, we undertook four so-called "energy audits" on our 1966 Seattle home, which has a finished 1,100-square-foot main floor and a partially finished 1,100-square-foot basement. We wanted to learn both how to improve the finished portion of our home and how best to add insulation and factor energy efficiency into an eventual basement remodel.



*Marcellus Hall*

Energy audits -- assessments of your home's energy efficiency -- run the gamut from free do-it-yourself audits offered online to paid inspections in which professionals with varying credentials spend up to three hours scrutinizing the home and determining what gestures will improve its energy efficiency and which fixes will reduce energy expenses. More sophisticated professional audits employ high-tech devices, including "blower door" fans, which lower indoor air pressure and enable technicians to measure draft levels, and infrared (thermographic) scanning, which can measure surface temperature variations and thus spot air leaks and poor insulation.

We started with two do-it-yourself energy audits offered free online, including the Home Energy Yardstick offered by Energy Star, the organization that promotes energy efficiency and endorses energy-efficient products, and Home Energy Saver, a free online audit from the Environmental Energy Technologies Division at Lawrence Berkeley National Laboratory, a Department of Energy lab operated by the University of California.

The free Home Energy Yardstick was disappointingly basic -- especially given how much data we had to provide from 12 months' worth of utility bills. However, it's not a bad starting point. The Yardstick calculated that we have a 1.7 efficiency score on a scale of 1 to 10 (oops). Tips for making changes were basic, such as using a programmable thermostat (already in use), energy-efficient bulbs (check), and Energy Star-endorsed appliances. Nice tips, but rather generic.

Next up, Home Energy Saver put us through more paces, asking us to answer 20 categories of questions ranging from insulation levels in attic walls to our furnace type. We had to guess at some answers, but, assuming we guessed right, the data provided were detailed: The program spat out nine pages worth of information on possible improvements, including the cost to implement each, and how much we would save in energy costs. For instance, insulating our basement to R-11 (insulation-speak for thickness levels -- the higher the better) would cost only \$480 but could save us \$115 per year in reduced bills. These were estimates, to be sure, but they helped us shape priorities.

The professional inspectors drilled deeper, looking more at the "building envelope" of our home and making more concrete recommendations. The Home Detective, a home-inspection company that also performs energy audits, sent an inspector who checked our exterior, climbed in our attic and perused our basement, but didn't bring out some of the higher-tech gear. The upshot? It suggested that we increase the "R" value of attic insulation to R-30 or more, insulate interior walls surrounding our non-insulated garage, and insulate the perimeter of the basement's ceiling -- an area known as the house's "rim joists." Minor fixes would include sealing ducts and any spot where pipes intersect with a floor or ceiling. The cost: \$169.

Pinnacle Inspections used both a blower door test and infrared scanning to investigate how airtight our home is. The blower door test, which the technician ran twice to make sure results were solid, revealed that our home is relatively airtight for its age -- possibly due to our new windows. The technician seconded Home Detective's recommendation to insulate rim joists and walls adjacent to our garage, but also was able to use infrared scans to point out non-obvious sources of drafts on our main floor, all needing only minor fixes. These areas included the front door (which needs weather-stripping), switch plates (which need fireproof electrical insulation), window trim (which needs insulation), the attic trap door (which could use weather-stripping or other insulation), and a bathroom fan that is vented into the attic (and could be better insulated).

In the end, we felt that Pinnacle's high-tech energy audit was worth the \$550 price tag, since it gave us short-term and low-cost repairs we could make now as well as guidance for future insulation projects. Now, we're ready to tackle that basement.