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THE Home Energy Audit



By David Neilsen

We spend the most time in the coldest room in my house.

Our kitchen is freezing. Whether it's my wife and me preparing a meal or my kids sitting at the counter eating, we are all heavily bundled up. Slippers are a must. I've pulled my warmest bathrobe over my regular clothes more than once or twice. Turning up the heat doesn't really do much more than inflate my Con Edison bill. So when the winter months rolled in this year and the kids' teeth chattered between bites of their waffle, we knew we had to do something.

So we arranged for a home energy audit.



Caulking doors, windows and even baseboards can prevent cold air from entering your home.

PHOTO COURTESY OF
GREEN STAR ENERGY
SOLUTIONS

What Is a Home Energy Audit?

During a home energy audit, a team of professionals arrive at your door and proceed to explore every nook and cranny and crawl space to evaluate your home's energy efficiency. One such professional is Chris Puleo, co-founder and Director of Westchester Operations for Green Star Energy Solutions. Puleo sums up his job as "Trying to help people figure out the best ways to save energy and reduce [their] utility bill."

An audit generally lasts about 2 1/2 hours and will end up telling you things about your home you never knew. For example, my audit uncovered a crawl space I didn't even know I had. The contractor performing the audit takes a whole-house approach and tests everything, looking at not only the energy efficiency of your doors and windows but also evaluates your appliances, identifies safety issues, scrutinizes the drafting of the furnace, tests your CO2 levels and more.

Puleo and his partner, Green Star Technical Manager Matt Slattery, performed a Comprehensive Home Assessment, which is a standard home energy audit done by Building Performance Institute (BPI) accredited home performance contractors working with the Home Performance with Energy Star program offered by the New York State Energy Research and Development Authority. NYSERDA is a state authority tasked with helping New York

meet its energy goals, and the Home Performance with Energy Star program has helped thousands state-wide identify and finance energy efficiency improvements. "The program was created in 2001," says NYSERDA Spokesperson Colleen Ryan. "As of Dec. 31, 2009, 29,661 homeowners have taken advantage of the program."

Why Is a Home Energy Audit Important?

Your home is, more than likely, wasting a lot of energy. In fact, most families are literally letting their energy (and therefore money) vanish into thin air – the air in their home. It's called The Stack Effect. "Every cubic foot of warm air leaving through the top, [is replaced by] cold air coming in through the bottom, and you're paying a lot of money heating up that air," says Slattery.

A home energy audit will tell you where your house is losing that air. It will also go a long way toward explaining why the living room may be freezing while the baby's room is a sauna. "The [Home Performance with Energy Star] program can make a house up to 40 percent more energy efficient," says Ryan. "And it also creates a healthier, more comfortable living environment for the homeowner and family." The idea is to insulate and stop the air from moving around without your permission. And you have to be thorough. "All it takes is a 5 percent void to create a 50 percent heat loss," says Puleo. Peter Bell, president of Hudson Valley Energy Consultants, gives a concrete example. "If you have drop-down stairs to your attic, and it's not insulated, it's like having a window wide-open all year long."

With NYSERDA trying to reduce energy consumption throughout the state, insulating those drop-down stairs becomes, to them, a big deal. It's an example of what the industry calls low-hanging fruit – small, inexpensive fixes that can lead to big savings. "It's important because you're not only helping people reduce their energy costs, but their energy consumption," says Ryan.

Finding the Right Contractor

When searching for a home energy performance contractor, you're best served

to look for people who specialize in green consulting. Judith Martin, principal and founder of Green Home Consulting says, "Not only do we recommend solutions to the problems, but we also have knowledge and expertise regarding the financial incentives that are available from the State and the Federal Government that help people pay for these changes." To help facilitate matters, NYSERDA created www.getenergysmart.org. This is a great source of information and contacts that will go a long way toward putting your family on the road to energy efficiency.

The price for an audit generally ranges anywhere between \$200 and \$300, though larger homes can cost more. "I would say it is worth it for pretty much anyone who owns a home," says Martin.

Energy Audit Day

Once I had set up my appointment, I asked Puleo what I should do to prepare for his visit. His answer? Nothing. "I want to come in and see how you're living there every day." He wanted us there, he wanted our kids there, and he wanted to see us in our natural element. This sentiment was also echoed by other experts I consulted.

We began the audit in the attic, often a common problem area. After taking a moment to marvel in the energy inefficiency of my home, Puleo was already seeing major choices looming ahead. "You have to pick a place where you're going to fight your battle, thermally," he says. "When you talk about an attic, it's either in the attic ceiling, which brings the attic into the energy envelope, thus you are paying to heat and cool it. Or it is in the attic floor, which excludes the attic from the energy envelope." An energy envelope refers to the area in your home you're trying to condition. Imagine your home as a big mailing envelope, anything inside that envelope you're going to be heating or cooling, anything outside the envelope, you're leaving to the whims of nature. When

you create an energy envelope, you're sealing that mailing envelope shut so that conditioned air is trapped inside and not leaking out into the void.

Five Things You Can Do Right Now

You don't need to hire a contractor and get a home energy audit to start saving energy and money in your home. "There're lots of things people can do themselves," says Puleo. Here are just a few simple things you can start doing today.

1 Change the time you choose to run your appliances. The more energy being used, the more it costs, so wash your clothes and run your dishwasher at night, when demand is low.

2 Clean your air filter every three months. "The best 10 bucks you can spend," says Puleo. "Just take the whole thing out, take it down to Home Depot, and have someone give you a replacement for it."

3 Change your light bulbs to compact florescent bulbs. This is a standard tip that has become almost a cliché, yet far too many families have yet to make the switch.

4 Update your appliances. "Appliances that are more than 10 years old tend to be much, much less energy efficient than appliances that are available today," says Martin.

5 Weather-strip your exterior doors. "Make sure there's no air flowing around outside of the door, either on the bottom, the top, or the side," says Bell. "As soon as you have air exchanged, you're losing energy."

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Many homeowners would be wise to check their attic for adequate insulation. This attic is in serious need of proper insulation. PHOTO COURTESY OF GREEN STAR

ENERGY SOLUTIONS

After fully exploring and measuring my Rube Goldberg-inspired attic, we moved into the basement, where a large, crawl space that was not insulated was discovered directly under the kitchen. "Normally I like to bring crawl spaces into the energy envelope to take advantage of the geo-thermal properties," says Puleo. "You only have to dig down four feet around here to get to constant 54-degree earth below the frost line." In the case of this particular crawl space – whose lack of insulation went far to explain the arctic conditions of my kitchen – bringing it into the energy envelope wasn't going to be practical, so the thermal battle would be fought in the ceiling of the crawl space.

Throughout my audit, Puleo and Slattery used a variety of the basic tools of the trade: thermal imaging cameras, combustion equipment to check the heating system, gas detectors to make sure there were no leaks anywhere, and finally, they brought forth The Blower Door.

Slattery hooked up a large, red sheet fitted with a big fan over my front door, making the entrance look like something Jack Bauer would have to squeeze through in order to escape certain death on an episode of 24. "This [Blower Door] is designed to tell us how leaky your house is and where those leaks are coming from," says Slattery.

As expected, the entire audit took a little over two hours. Once finished, the guys packed up their equipment and headed back to the office to prepare the report. I could only hope the contractors would come back with a cost-effective plan of attack.

After the Audit

After the audit, the contractor comes back a few days later with the findings. Often, the homeowner is presented with a full report detailing, according to Puleo, "What you have, what you should have, and how much it'll cost to get you there." The list of recommended work can also

include estimates on how long it will take for each item listed to pay for itself in utility savings. After that, it's up to the individual homeowner to decide what to do with the information provided.

Some of the simplest fixes can be made by the homeowner themselves. Other measures – insulating the attic, replacing windows – require the service of a professional. The average amount homeowners spend is in the \$7,000 to \$8,000 range, but most jobs fall far on one side or the other of this happy medium. Whatever the cost and size of your project, you can generally expect to qualify for a rebate program to help you afford the work. Currently, NYSERDA's Home Performance with Energy Star program offers a 10 percent rebate on anything used to weatherize your home. This includes insulation, air sealing, replacement doors and windows, HVAC systems, and much more. Further rebates will be available in the near future.

The best monetary gain, however, is in the savings on your monthly energy bill. Martin of Green Home Consulting went through the energy audit process just over a year ago. She made a number of energy-efficient improvements to her home. The result? An average savings of 20 percent each month, proving there are better ways to save on energy than living in a freezer. "People tell me they're living at 62 degrees because they're trying to save on their fuel bill," she says. "You don't have to do that. You can make your home more efficient, be comfortable and not spend as much money on your fuel bill."

A week later, we received our home assessment containing an itemized list of suggested work to be done, complete with how much each job would cost and how much we could expect to save on our energy bill. The most obvious job was to insulate the crawl space under the kitchen, but there was also a lot of work to be done in the attic. Armed with our comprehensive report, we at least have an idea of what's ahead of us. It's a lot of work, but the 10 percent rebate will ease some of the pain, and the ability to walk into the kitchen in something less than a parka will ease the rest. ♦

David Neilsen is a Westchester resident, stay-at-home dad and frequent contributor to *Westchester Family*.

RESOURCES

- **New York State Energy Research and Development Authority (NYSERDA)** – www.nyserdera.org and www.getenergysmart.org. 866-NYSERDA or 518-862-1090.
- **Green Star Energy Solutions** – www.gogreenstar.com. 620-1200.
- **Green Home Consulting** – www.greenhomeswestchester.com. 967-2956.
- **Hudson Valley Energy Consultants** – www.myenergyaudits.com. 877-773-2432.

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