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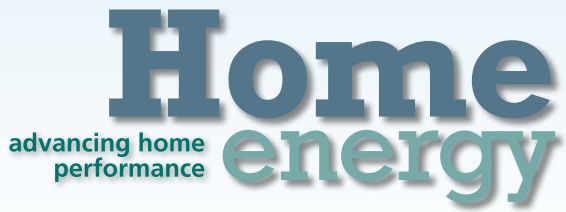
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Home Performance with Energy Star

ROUNDTABLE

*For this special issue of **Home Energy**, contributing editor Steve Mann contacted a panel of successful Home Performance with Energy Star contractors to get their answers to some basic questions about auditing and correcting homes. Not surprisingly, each company has a different take on the process, the market, and the best way to solve customer problems.*

THE INITIAL AUDIT

Home Energy: What is the scope of a typical home energy audit and how long does it take?

Steve Byers: Our typical home audit includes a homeowner survey/interview, visual inspections, blower door testing, infrared (IR) thermography, combustion safety testing, and reporting. This takes between two and four hours typically.

Matt Golden: Our comprehensive assessment typically takes around four hours and includes the diagnostics listed below. We start by interviewing the homeowner to understand their concerns and priorities and then conduct a walk-through. Next we cover some basic building science principles with the homeowner. After that our specialists get to work gathering data and analyzing the home. A review session and estimate for construction work is typically presented three to five days after the test.

Chris Strand: We note any window that receives more than one hour of summer sun; the condition of the air distribution system; the condition, age, and efficiency of the HVAC system; the condition of the attic insulation; and the significant air leakage points. Our audit takes one-half hour to two hours, depending on the size and condition of the house.

Larry Taylor: Our visual clipboard audits take about one hour and provide minimum information without testing. A comprehensive audit takes two to four hours. We then

provide a comprehensive report of findings and costs to repair findings and a prioritized list of repairs to be made.

HE: What diagnostics/tests/evaluations do you typically include? How do you price your audits? Are they profitable? Can you do an effective home energy audit in three hours?

SB: We do blower door testing, IR thermography, combustion safety testing, duct testing as necessary. Our prices are \$300 base price for a home of 1,500 square feet or less; \$30 additional for every 500 square feet above 1,500 square feet; and we charge for mileage.

These audits are profitable. Other audits performed in the context of a variety of program sponsors have different service levels and come very close to being not profitable. When EnergyLogic is able to submit a proposal to the homeowner for home performance contracting along with the audit, the profitability of the audit becomes less critical.

We can do the audit in under three hours, if we follow our process! As soon as the process is sacrificed, often for good reasons, it's generally not possible to finish in three hours.

MG: We do blower door tests, IR camera inspections, room-by-room load calculations, combustion safety tests, HVAC equipment inspections, visual duct inspections, insulation inspections, exhaust fan flow tests, analysis of historical electrical and gas consumption, lighting audits, and appliance audits. Audit

prices start at \$595 and increase incrementally depending on the house square footage. The audit side of our business breaks even.

We typically deploy two specialists/testers for a home. In homes of less than 3,000 square feet, three hours is usually enough time to do the audit. Larger homes, or custom homes with unique floor plans, may require a little extra time.

CS: Our audit is strictly visual. There is no testing. All of our audits are free and include an estimate for the needed upgrades. The audit takes one-half hour to two hours, depending on the size and condition of the house.

We do test after installation. This includes a duct leakage test, an air infiltration test, air balancing, system static pressures, and worst-case-scenario backdraft testing.

LT: Our comprehensive audit includes testing duct leakage, load calculation information, air flow from HVAC system measurements, IR camera inspection, CO testing, backdraft testing, and so on. Our charge for a visual audit is around \$85 with a comprehensive audit starting at \$345. Visual audits are not profitable, and comprehensive audits break even with the profits made on repair sales.

The time it takes for us to do an audit depends on the size of the house and the level of testing being performed.

HE: Are there any tools, equipment, exhibits, or demonstrations that help you sell Home Performance?

SB: IR certainly helps. We need to develop better tools for our auditors to sell the job.

MG: During the final walk-through of the home, we utilize the blower door test to show homeowners major areas of leakage and concern. The IR camera is also an effective tool to show homeowners uninsulated areas that are of concern for heat loss. The data collected from flow hood tests is also an excellent tool

for showcasing the benefits of duct balancing to maintain an evenly heated home.

CS: Yes, cameras are very effective to document attic, HVAC, and ductwork issues. When customers complain about rooms that are too hot or too cold, we will bring out our flow hoods.

LT: Yes, we use a lot of Energy Star brochures. We also have a puzzle of the house for showing the customer how items all work together to make a system.

HE: Does your company do the audit, the improvements, and the test-out? If you don't do the improvements, how do you find qualified partners for referrals to do the work?

SB: Yes, when we get the improvement work we also do test-out. When we don't do the improvements, since we have a long history in the area we have a short list of recommended companies that we refer to.

MG: Yes, we do all three. After testing numerous business models, doing the work ourselves is the only way to effectively achieve the performance metrics necessary to maintain a healthy, comfortable, and energy-efficient home.

CS: Yes, we do audits and improvements, and we test out. The only aspect we contract out is solar-screen installation. Finding qualified partners is a trial-and-error process.

LT: We want to maintain total control of the process. We find you have to educate and then train subs to the level of work you expect.

MAKING RECOMMENDATIONS

HE: Do you talk to clients about upgrades or retrofits during the audit or as a separate activity? How long does that typically take? What methods or techniques do you find most effective in convincing customers to make improvements to their home?

SB: Our process involves computer analysis, so it's best that recommendations be made at the end of the audit. However, if the homeowner accompanies the auditor during the audit, recommendations can be made to the homeowner as the audit is conducted. The challenge, of course, is to keep the audit moving.

Pointing out losses and obvious problems is effective in convincing customers to make

the improvements. Homeowners know things are wrong, they just aren't sure where. The IR camera is also effective. Finding at least some things that are low cost is also helpful in the current environment, since people just need to start moving in many cases but don't have the money for the bigger improvements.

MG: Both. We'll take the opportunity when we're at the client's home to speak to specific concerns, point out problem areas, and discuss potential solutions very generally. About three to five days after the test, we conduct a one-hour review session (either online or in person) covering the specific findings from the audit; discuss the impact of these findings relative to the homeowner's concerns; and review the recommended solutions to achieve the homeowner's desired goals.

What's most effective in selling a job depends on the reason the homeowner contacted us. If the home is always cold, we can help the homeowner to be warmer. If the concern is health, we can fix the problems that bring unhealthy air into the conditioned space of a home. We're not so much in a position of convincing homeowners to make improvements; rather, we're providing homeowners with a solution to their problem. We educate them as to why the problem exists, and explain why our approach to solving the problem is the right one.

CS: After our visual inspection, we fill out our investment agreement at the kitchen table with the homeowner, noting the recommended improvements, their cost, incentives available, total cost, and total incentives. Consumers' time is extremely valuable, and they want a one-stop estimate.

Honestly, what sells a job for us is a thorough analysis, a one-stop estimate, the incentives available, and our reputation. Customers only buy from people they like and trust. The majority of our leads are from previous customers and referrals.

LT: Most of the time we do not discuss repairs at the time of the audit. We use a separate auditor for the testing and reports. Then we hand the reports off to the sales team member for presentation and delivery of findings and repair cost to the customer. What is effective for us in selling improvements is educating our customers about what is happening, and how it affects their health, safety, comfort, and energy consumption.



Steve Byers *Principal*
EnergyLogic, Incorporated
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EnergyLogic is a diversified energy services company with several interlocking business units. These include Builder Services, Homeowner Services, Rater Services, and Commercial Services. Each of these units both gives and takes from the others while contributing to EnergyLogic's overall strategy of learning and distributing information to our partners through our educational efforts and software applications in particular. EnergyLogic was named Energy Star Partner of the Year by the EPA in 2009. The company has had a role in improving more than 10,000 homes in Colorado.



Matt Golden *President, Founder, and Chief Building Scientist*
Sustainable Spaces, Incorporated
San Francisco, California
www.sustainablespaces.com

Sustainable Spaces is a Bay Area provider of home performance services. Founded in 2004 with the mission of providing homeowners with a resource for finding and fixing the root causes of wasted energy in their homes, Sustainable Spaces is dedicated to offering whole-system solutions. A licensed general, solar, HVAC, and insulation contractor, the company fields an integrated team of HERS-certified Home Performance specialists, environmental engineers, and specially trained Home Performance retrofitters. Sustainable Spaces combines customer service with building science innovations and engineering solutions to transform each home into a model of healthy energy efficiency.



Chris Strand *Owner*
Strand Brothers
Austin, Texas
www.strandbrothers.com

Strand Brothers specializes in heating and A/C repair, maintenance, and installation; plumbing repair, maintenance, and installation; energy efficiency products and services; indoor air quality products and services; and building performance testing and consulting. The company is a member of the Better Business Bureau and the ACCA. Most of our technical workforce is licensed and certified by North American Technical Excellence (NATE).



Larry Taylor *President*
AirRite Air Conditioning Company, Incorporated
Fort Worth, Texas
www.airrite.com

AirRite was founded as a HVAC company in 1955 and started offering Whole House as a System services in 1991. The company provides a full range of residential and commercial HVAC services, and indoor air quality, electrical, and attic insulation and ventilation services.



HE: What are your customers' primary concerns—comfort, safety, utility costs, health, sustainability, or something else? Are utility bills (and a disaggregation) an effective way to talk to clients about upgrading their homes?

SB: Our customers are concerned with comfort, followed by cost, followed by sustainability. Utility bills are only of interest to a technically savvy client.

MG: All of the above. Every home is unique, and every homeowner is unique as well. For homeowners concerned about the cost of their utility bills, it's very effective to provide a frame of reference for the energy savings they may achieve. Our main goal is to explain the efficiency improvements that we'll achieve in the home, with energy savings many times a by-product of the efficiency improvements.

CS: Our customers think about comfort, utility costs, home maintenance, and sustainability. Health is just icing on the cake. Yes, utility bills definitely help us talk to our customers about upgrades.

LT: Our customers are concerned about all the things you mentioned. We determine their concerns by doing a complete interview with the customers about their expectations.

It's not always the utility bills that concern our customers. Too many times you are trying to convert something into payback, and your health, safety, and comfort are not always tied to direct energy savings. Most of the time the improvements relate to energy savings, but I don't try to sell on that alone.

HE: Do you try to estimate utility savings when making recommendations about the home? Do you ever evaluate the utility bill savings some time after a retrofit is finished?

SB: Our computer analysis makes this quick and quite accurate. We use a new tool called OptiMiser that is currently in beta testing and will be commercialized by June 2009. It is a very accurate, very easy-to-use tool that allows full disaggregation, produces benefit-cost information, and makes report generation on site a simple process, including bid generation.

We rarely evaluate utility bills after a retrofit, though we should more often!

MG: We give approximations of how much we'll be able to reduce their loads/bills and set measurable goals for ourselves to aim toward when performing the retrofit. We meet and often exceed the goals that were set. We know from several years of experience that fundamental work (for example, insulation and air sealing) typically reduces bills by 30%–50%.

Typically, contractors and installers work to fulfill a job. We set performance metrics for every home we work on. We don't leave the home until we achieve the performance improvements we've committed to.

We don't perform postretrofit evaluations, but we often hear from satisfied customers about the energy savings they've achieved as a result of our work.

CS: Usually our upgrades involve replacing HVAC equipment, so estimating utility savings is extremely simple. If we take out an old unit with an 8-SEER rating, and replace it with a smaller 16-SEER unit, we know the cooling savings are going to be at a minimum of 50%. If we just do building performance, we give a very rough estimate. Customers are not as concerned with the exact utility savings, but are more concerned about getting their home to contemporary energy efficiency upgrade standards.

We seldom need to evaluate our improvements after the retrofit—maybe once every two years. Our customers provide the best quality control any home energy contractor could have. If they do not save, they will definitely give me a call. What I typically find is that their baseload is so high that the cooling savings are not as easily discernable. We often get calls a year or two later telling us that their savings were more than expected.

LT: On some items you may be able to project some energy savings; on others that are related to comfort and humidity, for example, there is not a direct energy projection.

We don't do a formal postretrofit evaluation, but customer feedback surveys indicate

that our customers are achieving significant savings. Happy customers provide me with better information than kWh reports.

HE: When making recommendations, how do you handle pricing or estimating?

SB: We handle insulation, air sealing, crawl-space retrofit, and other miscellaneous improvements in house. Thus, that pricing is quite accurate. For other items, we use default assumptions that we check frequently with our trusted pool of trades.

MG: In addition to being highly trained in building science, our in-home teams have also worked for at least a month with our construction crews to gain an in-depth knowledge of the projects they're proposing. The field teams also meet with our engineers and construction leads to ensure they're proposing the right solutions at the right price.

CS: Cookbook and the skill of the analysts. All of our analysts have a minimum of 15 years experience.

LT: After years of experience and job costing, we have established a lot of items into cookbook pricing. On others we simply add together the list of tasks to arrive at the cost.

IN THE FIELD

HE: What is the minimum set of equipment you recommend?

SB: Blower door, good visual inspection aids, IR camera (to be competitive), good combustion safety-testing equipment.

MG: Blower door, to test the building envelope for leakage; low-flow balometer, to test the air flow out of each duct supply; hygrometer, to measure temperature and relative humidity; protimeter, to measure the moisture content of certain materials; combustion gas analyzer, to detect gas leaks; CO monitor, to determine levels of harmful CO gas; low-e detector, to detect low-e film on windows; respirator, to protect our workers in crawlspaces and attics; boroscope, to inspect wall/floor cavities.

CS: Duct Blaster, blower door, digital manometer, flow hood, insulation blower, and IR camera. HVAC personnel have additional recommended equipment.

LT: Blower door, Duct Blaster, flow hood, CO detector, and temperature measurements.

HE: Do you have any equipment tricks of the trade that other Home Performance contractors might find useful?

SB: Primarily, be organized. Disorganized equipment makes for very inefficient auditing. Keep equipment clean and in good working order and have backup equipment when possible.

MG: Most are hard to explain. You actually need to see the “trick.” Using theatrical fog with a Duct Blaster can help detect leaks without using smoke or other chemical agents that could be harmful (or set off the fire alarms).

CS: We have 8 to 13 very experienced crews, and I am sure that they have all kinds of tricks.

LT: Most Home Performance contractors have all attended the same conferences and share the tricks. Our advice is to stay involved in the industry events, read information in trade publications, and stay aware.

HE: Do you use any special software for auditing, reporting, modeling, or other

purposes? Do you do any energy modeling or provide your clients with ratings such as a HERS index?

SB: We use our own software, OptiMiser, that should be available in June 2009. We don't typically calculate a HERS index.

MG: We have our own proprietary software. We do energy modeling, but we don't currently provide HERS ratings.

CS: We use a simple, internally developed, paper-based checklist that closely matches the requirements of our local incentive programs in Austin. We look strictly at HVAC and envelope issues. That doesn't really require any special software. Doing a full complete audit would be so expensive as to exclude 80% of the potential market.

We don't do modeling or HERS ratings because it would price the audit out of reach of most customers. Also, the customer doesn't care.

LT: We are a Comfort Institute member and use their Infiltrometer 9.0 software for infiltration reporting and SEER/AFUE degradation

ratings. Other than that, we use ACCA *Manual J 8* from WrightSoft for loads and export the information to REM:Rate for the ratings and cost calculations. Once all these data are gathered, we use Word to import photos and other information and generate the final report with comments and recommendations.

HE: What types of things can stop a job cold (for example, asbestos, or knob-and-tube wiring)? Do you have any entertaining or cautionary stories of unusual situations that stopped a job in progress?

SB: We'll test with asbestos as long as it hasn't become friable. Knob-and-tube wiring will stop insulation work, of course, but it becomes a recommendation/requirement prior to insulating on our report. Vermiculite is a stopper for the blower door test, but the rest of the audit can proceed.

Nothing has stopped a job cold, but some things have certainly made it unpleasant! We once had an auditor encounter a large, chained-up Rottweiler in a basement that put a few gray hairs on his head. We also had a

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student tell us that he had encountered a mountain lion in a crawlspace.

MG: There are few things that really limit or could possibly halt an inspection, the most significant being dangerous levels of CO or combustion gases in the home. Others include faulty construction, such as open walls, unfinished areas of the home, or open cavities. One of our specialists was trapped in a crawlspace by a family of skunks. It's good to know if there are any pest problems beforehand.

CS: Any hazardous condition besides what is noted above, such as open wiring, stinging insect infestation, vermin, and mold, can stop a job. It is never entertaining to stop a job in progress.

LT: When we run across something that will change the scope of the project, we stop the process and leave it in a safe condition. Then we get all parties together and discuss the options. Once a new plan has been established, then we proceed. Do not try to make the decision for the customer. You will lose.

There is not enough room in this article for the number of stories out there. From a cautionary side, we find chemical-sensitive people more often than you might think, so make sure you ask if anyone has this issue.

HE: How do you reduce your risk and make sure that customers and other trades perceive your company as a high-quality company?

SB: Primarily by being very honest and never violating our integrity. Honesty and integrity serve us well!

MG: We constantly seek customer feedback after every energy audit and retrofit project, and we are obsessed with customer satisfaction. We reduce our risk by providing the highest quality of workmanship, using only the highest-quality materials. The best testaments to the quality of our work are the referrals we receive from satisfied customers. We deliver what we promise.

CS: How the installation looks and thoroughness matter, and I believe we are one of the few companies in the nation that have internal quality control inspectors who get with the homeowner a few days after every job is completed.

If we take care of the customer, the customer will take care of us. We immediately respond to any customer complaint, and

all of our work has a 100% satisfaction guarantee.

LT: We use a lot of forms and waivers to make sure the customer knows exactly what is going to happen. We then make sure our field crews know the scope of work to be performed. If you can make the job go smoothly, then you have increased the perception and validation that you are a high-quality-performing contractor.

Educate the customer and do what you say. If a problem does come up, solve it quickly. Giving a complete job refund is a lot less expensive than legal work, plus it doesn't produce negative conversations from the customer.

HE: What type of insurance coverage do you recommend?

SB: General liability, but I sleep better knowing we also carry errors and omissions insurance.

MG: General liability, employment practices liability, directors' and officers' insurance, workers' comp, property, additional property, and inland marine.

CS: Workers' compensation, general liability, completed operations, and auto liability.

LT: Beyond the minimums required by law in our marketplace, we look at the value of the market we are serving and make sure we have coverage to cover that exposure. For instance, if you are working on \$2 million homes, you better have 50% more coverage, so you would want \$3 million minimum.

EMPLOYEE DEVELOPMENT

HE: What qualifications do you recommend for your auditors and other employees?

SB: Our auditors must be RESNET certified, and we also like to have them be BPI building analysts as well.

MG: HERS certification, BPI accreditation, good people skills.

CS: Extensive field experience. Certifications include NATE, state mechanical license, and air balancing.

LT: We like for our auditors to be more skilled on the technical side and also have some customer relationship skills. We don't ask them to be sales personalities, but they need to communicate well. The installers need to understand the building science side as well as how to plan, test, and evaluate the work

site. They also need to be able to make a decision as to when to stop work or call for additional information without taking it personally. We like to have as many certifications and accreditations as possible. It gives the customer a feeling of comfort with our team members.

HE: Is on-the-job mentoring a good way to train employees?

SB: Absolutely. That's the way we do it.

MG: Field training is the only way to reinforce the concepts that we try to teach in a classroom or office setting. The concepts we're employing are really best learned through active participation.

CS: Yes.

LT: It depends on the lead person doing the training. Just because they can do the job does not mean they can teach the job. Classroom education along with in-field training and performance is best.

HE: How do you make sure the work is being done properly and to a high quality level?

SB: We check in with homeowners, follow up on work, and have our lead auditor go along on a random basis on audits.

MG: We test in, and we test out. Typically, contractors and installers work to fulfill a job. We set performance metrics for every home we work on. We don't leave the home until we achieve the performance improvements we've committed to. It's the only way to provide the high-quality solutions our customers have come to expect from Sustainable Spaces.

CS: We have outstanding HVAC and building performance field managers. Those managers have weekly meetings with their staff. The sales manager has weekly meetings with the advisors and the field managers. We believe in a continuous-improvement philosophy. As noted above, we do a quality control check on every job.

LT: We do a test-out and compare the results to the test-in results. We also use a three-part no-carbon form. Part one is by the field team, part two is by the salesperson, and the final part is random by a supervisor or manager. 🌟

Steve Mann is a HERS rater, Green Point rater, LEED AP, Certified Energy Analyst, serial remodeler, and long-time software engineer.