

Profiles in Green

JLC talks to
four builders
with long track
records about
what it means
to build green

These days it seems that everyone is claiming a slice of the green pie — from the manufacturer whose product boasts 10 percent recycled content to the association whose costly certification process promises verification that your project meets the highest green standards. Given the bewildering number of presumably authentic labels and ratings, it's easy to get confused; throw in the out-and-out promotional hype, and it quickly becomes clear that the best way to approach "green" is with a healthy dose of skepticism.

So for this story, *JLC* turned to the single most reliable source: the community of practitioners. Editor Dave Holbrook spoke with builders and remodelers who have been building "green" since before it had a name. He asked them how they got started in green construction, and what it means to them, their subs, and their customers, and how it affects their bottom line. Presented here are excerpts from those recorded conversations. As you'll see, no one definition of green is up to the task. Though they have elements in common, the approaches are as varied as the landscapes in which these builders work.

Peter Taggart

When I started Taggart Construction in 1994, I'd already been going to building-science workshops and doing a lot of research in environmental issues. I knew I wanted to pursue better, higher-performing buildings. In 2005, we designed and built the first LEED-certified house in the nation, the Pleasant Hill Home (usgbc.org or tagcon.com). We'd been in business 10 years when we built that house, so it wasn't our first green house — it was simply our next green house.

We've always gone for high R-values, with walls in the range of R-28 and roofs in the range of R-50. We use dense-pack cellulose insulation in every one of our homes. Throughout our history we've applied passive-solar design and used compact fluorescents, no-VOC or low-VOC paints and adhesives, and high-quality programmable bathroom fans in our ventilation strategies. We consider building orientation and passive-solar opportunities, durability issues, and water management. Many homes

Taggart Construction, Freeport, Maine

New construction, light commercial, remodeling, architectural design, custom millwork

\$4 million annual sales; 25 employees

Energy Star, LEED, R-2000

designed for aesthetic reasons with multiple gables and dormers show little thought given to ice dams and snow loads or where all that water's going to go — one of our areas of focus when we start. But our top priority is always the building envelope, the most permanent part of the structure.

In our remodeling work along Maine's rainy, wind-driven coast, we saw the results of poorly sealed exterior walls and began using rain screens to separate the siding from the building paper and restore that drying airflow. We like to think that some of our buildings are going to be around in a hundred years and that somebody's going

to deem them worth saving. So we think about durable details and products that are truly sustainable.

We really had to work with our heating contractors to get them to appreciate the importance of properly sizing boilers. They were concerned about not being able to supply sufficient heat to the house. Ten years ago, we were building super-insulated passive solar homes with a heat load of 40,000 Btu. But the smallest boiler at the supply house was 120,000 Btu, and if you oversize the boiler it doesn't run efficiently, wasting fuel. So we turned to the European models, where smaller systems were common. Now we mostly use wall-hung demand boilers, from Baxi (08706060780, baxi.co.uk), Viessman (800/387-7373, viessmann.ca), and Buderus (800/283-3787, buderus.net). It's important to us that our heating contractors keep up with the trade journals, go to conferences and workshops, and thoroughly understand boiler technology and control systems. When we start a new job, I want to know what they've been reading about and what they're thinking about in terms of equipment and control systems.

We're constantly educating our staff. The added overhead cost is significant, in the tens of thousands of dollars. But when we send people to a two-day high-performance-house workshop and they realize that what's news to others in the room we've already adopted, they come back really proud of our company. Last year, I sent everyone to a daylong class on zero-energy buildings. We're working toward that. We issue Joseph Lstiburek's *Builder's Guide to Cold Climates* to all our carpenters. And we have it in the conference room, where we share it with our clients. We also give them a copy of the LEED checklist, whether or not they're planning to register their home. We spend as much time educating our clients as they will accept.

But with all the press green building gets these days, it's less and less necessary. People are much more knowledgeable than they used to be. They've seen an aspect of green building or they've read about it. It's good for us; in difficult economic times, we have our largest crew ever — 25 employees.



In 2006 Taggart Construction's Pleasant Hill Home in Freeport, Maine, received a LEED Silver certification, the first in the nation for a residence. View the project profile at usgbc.org.



Taggart installs rain screens to keep water out of walls and prolong the life of trim, siding, and paint.

I was basically building green before I ever heard the phrase “green building.” In Wisconsin in the early ‘90s, we did earth berm, timber frame, passive solar, radiant floor heating, and a couple of Canadian envelope houses. I did a few projects for people who were chemically sensitive, and that made me really pay attention to the toxic-material side of things. I did a lot of research. When I returned to Austin in ‘99 and discovered the Austin Green Building program, I immediately joined up. I was real excited that there was a name for what I’d been doing.

A lot of what I learned about building for energy efficiency up north doesn’t apply down here. The heating load is such that if you can design for some passive solar, heating costs are much lower than the AC bills. We reduce those by getting things as super-insulated as we can. We prefer foam insulation, but if it just doesn’t fit the budget,

The Buckeye Trail House was featured on Austin’s 2008 Cool House Tour (austinenergy.com). Zirkel used structural steel for the framework and SIPs for the walls.



we’ll blow cellulose in the walls and spray foam under the roof deck. Here in central Texas, the AC ducts are all up in the attic, but the attic can get up to 130°F in the summertime. In an unventilated attic with foam on the underside of the roof deck, the temperature stays within 5°F of your downstairs temperature. Some people find it’s cool enough to eliminate AC.

We really encourage metal roofs because they reflect so much heat and work well in conjunction with the foam. The plain Galvalume (galvalume.com) is the most reflective, and it’s less expensive than the color options. And unlike the asphalt roofs around here, metal roofs don’t end up in the landfill every 15 years.

Termites are a big concern down here. Fortunately, we have nontoxic termite control. Under slabs and around all the plumbing penetrations, we use Termimesh (termimesh.com) or diatomaceous earth, a natural irritant to the bugs. We use Timbor (borax.com) borate salt on the wall framing, sprayed about halfway up the studs. It

Shelter Design & Construction, Austin, Texas

Remodeling and additions, light commercial, custom homes, design-build

\$1.8 million annual sales; 5 employees

Austin Green Building Program, Energy Star, USGBC, NAHB National Green Building Program

doesn’t kill the termites, it just makes the wood inedible.

Indoor air quality is important whether people are chemically sensitive or not. The more you’re exposed, the more likely you are to become chemically sensitive. I’m convinced that the huge increase in childhood asthma we’re hearing about is due to people moving into homes that are formaldehyde traps. That new-house smell — it’s poison. I’ve heard that 90 percent of the formaldehyde disappears within 90 days. But that 10 percent is just as bad as the 90 that’s gone. It’s bad practice to build the house really tight while installing products that off-gas poisons. There are several adhesives with low VOCs. Any caulk or adhesive that goes into the house, we look at the label, and if it’s more than 40 or 50 grams per liter, we don’t use it.

Sometimes clients want vinyl windows for their low cost and energy efficiency, but I try to persuade them to consider alternatives. First, vinyl off-gasses — but my primary reason is that vinyl factories are killing Louisiana. We discourage vinyl flooring and vinyl siding for that same reason. Watch the documentary *Blue Vinyl*.

We encourage stained and scored concrete floors because, at around \$3 per square foot, they’re very inexpensive — and if the owners get tired of the look, they can easily put something else on top. We’ve been using Synergy (800/929-6333, teragren.com) strand-bamboo flooring, a commercial grade that’s much harder than typical laminated bamboo. It looks more like a regular hardwood and is made with nontoxic VOC-free binders.



Built with 10-inch-thick Rastra ICFs, this residence has a metal roof and native East Texas red-cedar posts and beams.

I was involved in environmental issues for quite a while before I became a contractor. I resolved to link my two interests because conventional remodeling and construction were so wasteful and had such a large impact on the environment. In the fall of '91, another contractor in the Seattle area started giving workshops on environmental building issues. I joined him in founding the Northwest EcoBuilding Guild (206/575-2222, ecobuilding.org), which now has eight chapters in four states and lower British Columbia. That same year, I did my first project with a longtime green architect who challenged me to recycle

everything that was recyclable and to explore a number of other green aspects.

When I first committed to building green, I limited myself to five or 10 new materials or processes per job. I felt that it would be overwhelming to do more than that all at once; I recommend that builders not go too far out of their comfort zone on any given project. Look at it as a long-term transformation, because the learning curve is an issue for all of us. Many builders

are reluctant to get involved because the reality is, there's a lot to learn. One of the best ways to get started is to connect with early adopters who can address the ins and outs. A local green building chapter is a great place to start.

When we built the Sensible House (sensiblehouse.org), we did a number of green things way beyond what almost anyone else was doing at the time. While the premium was about 8 or 9 percent beyond typical building costs, the return on investment is a home that reduces life-cycle costs through energy savings and durable building methods.

The Sensible House pulled together a lot of different things: high R-values; energy-efficient appliances and lighting; properly sized hvac, air filtration, and ventilation; and the use of low-toxicity materials. That last item is at least as important as all the rest. The average American spends 90 percent of his or her time in the indoor environment. I think it's unacceptable for us to be building and



Sunshine Construction's Sensible House, built in Seattle in 2004, was the first home to earn a five-star rating in King and Snohomish Counties' Built-Green program. Read more at sensiblehouse.org.

Sunshine Construction, Seattle

Residential remodeling and additions, new construction

\$400,000 to \$600,000 annual sales;
2-3 employees

Energy Star, Built Green

renovating homes to be tight and efficient when we're using toxic materials that affect the occupants.

The U.S. government puts out a list of known and probable carcinogens, and urea formaldehyde is on that list. Urea formaldehyde is common in adhesives and plywood but should be banned nationwide — or at least be held to standards as rigorous as those in the EU [European Union]. There are also 80-some chemicals in traditional carpeting, quite a few of them off-gassing. And shoes track all kinds of other toxic residues into the house, including lead and mercury. That stuff ends up in the carpet along with dust mites, molds, and mildew. Conventional cleaning methods do little or nothing to remove them. An article in *Scientific American*, November '98, cited a study of carpets in Seattle homes. It found that if the data were applied on a larger scale, those carpets would qualify as EPA Superfund sites.

I once heard it said that construction professionals are public health professionals because what we do affects public health. That has really stuck with me. We need to be brought up to speed on what it takes to build healthy indoor environments. Asthma is on the rise, and there are more and more people with multiple chemical sensitivities. Our medical industry focuses on expensive treatments rather than prevention. In the construction industry, we have an opportunity to work in prevention. It's an incredible marketing opportunity for us. There's a lot to learn, but there's also a lot of good information out there.



The Sensible House has a 7,000-gallon cistern that collects rainwater for landscape irrigation and toilet flushes. Its concrete lid — made with recycled fly ash — doubles as a patio.

What got me interested in building green was core respect for value in place. I have a keen interest in the expedient use of resources, whether it be cash, building materials, or buildings themselves. I think remodelers are well-positioned to be green by definition. We're recycling entire buildings — creating adaptive reuse of shells built for another time, that today need to be rejuvenated for viable use in the coming decades.

I'm a strong advocate for life-cycle costing as opposed to first cost. Regrettably, we have a civilization fixated on first cost and regularly miss the ball on life-cycle costs. Getting through to clients becomes at times a painful educational challenge.

Within our company, there is a diligence about operation and product that has recently been relabeled green — but we've been that way for a long time. Bringing core values of energy efficiency, production efficiency, and materials efficiency to the business side of the table is something we've done from the outset as a strategic initiative to make sure the company is profitable.

My top priority when I consider a new project is that it's got to be profitable. Fundamentally, if the business doesn't work, you can forget about going green. You have

to be sustainable. Green is staying alive; green is creating a durable company. Many fail to create that bridge between fundamental



Asdal Builders brought this 1898 Victorian in Califon, N.J., back from the brink to become the nation's first zero-energy remodel. It's now an inn. A Web site (raritaninn.com) monitors the building's photovoltaic output in real time and contains schematics of its geothermal and solar hot-water systems

Asdal Builders, Chester, N.J.

Remodeling, new construction, multifamily, light commercial

\$2 million annual sales; 4 employees

BPI, NAHB National Green Building Program, Energy Star Builders Challenge, PATH

business basics and green. A mastery of fundamental business practices comes first. You can't work for free. If you compete by arguing back to first cost, you might as well be left by the roadside, because green is not about first cost. It's a whole different mind set: It's not about how cheap can you build; it's about how good you can build and how well the building performs. That's fundamental to the green discussion.

Some customers think that to be green you have to have a specific product or list of products — photovoltaic panels, solar hot water — that it's only a matter of technology. But I say that technology is the third bucket to fill.

The first bucket is consumer behavior. If, through education and careful instruction, you can manage homeowners' behavior and how they interact with their building, that certainly is green. Using screens in April, May, and June, and air conditioning only in July and August, and then screens again in September, October, and November gives you a tremendous energy contraction. That's working with your building and the environment.

Bucket two is consumption management, and that's a 40-year-old concept called weatherization: storm windows, storm doors, gasketing, sealing — simple things that minimize a building's energy consumption. Our most commonly used material is caulk — tons and tons of it, from framing to finish — to minimize air leakage.

So first, fix behavior; second, fix the building; and number three is that fun bucket filled with energy-recovery ventilators, on-demand water heaters, spray-foam insulations — all the technology and products out there. But to jump to those without fixing behavior is a really poor use of resources. A LEED platinum certificate on the wall doesn't tell you how the house is performing, because such a large component is consumer-driven: It has to be operated well.

JLCEXTRA

To see more photos and read interviews with green remodelers Michael McCutcheon and Michael Anschel, go to jlconline.com and click on the JLC Extra tab.