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# Efficient Homes Deliver

Today's savvy homebuyers seek value

» JEFF GUNDERSON



**T**exas Green builder Chris Miles, cofounder of Lewisville-based GreenCraft Builders LLC, hosts a weekly radio program covering residential building.

Recently, he had a caller on the program who was the owner of a mold remediation business. The caller said that despite the housing slowdown, business was booming more than ever. Miles says this is a great example that shows what is important in terms of designing and constructing homes in today's market.

"Nowadays, homeowners are much more concerned with mold and other elements that are known to cause damage to homes. This is especially true when it comes to buying a home," he says. "However, in addition to that, there are many other issues that homebuyers are tuned into that they might not have

necessarily been aware of only five years ago. This includes indoor air quality, energy savings and being able to control the temperature and humidity inside their homes."

Indeed, today's homebuyer is increasingly educated and much savvy when it comes to designs, features and technologies that are available in the home market. According to a recent survey for the NAHB, 78 percent of respondents said they would spend more money for homes equipped with Green designs, as long as government incentives or rebates are in place to help offset those costs. Undeniably, there is strong evidence that increasingly more demand is present in the market for quality designs and Green products. In addition, residential building is also becoming more specialized, with a higher number of technologies available in the market.

"Successful homebuilding today goes

beyond simply constructing homes," says John Wesley Miller, a Tucson-based homebuilder who has received numerous awards for energy conservation in over 50 years of building. "In today's evolving market, being a builder also means being an architect, a land developer and an engineer. But beyond that, we need to be familiar with the culture, the environment and the local economy of where we are building. Factors such as water availability, the region's architectural style, and the lifestyle of the local population are important issues as well," he says.

Still, there are other factors for builders to consider, such as land availability, growth restrictions and the high cost of land, all of which can influence the shape, size and design of a structure. These considerations, along with others, are important for builders to take into account when designing and engineering today's single family home.

## SUSTAINABILITY AND ENERGY EFFICIENCY

According to John Wesley Miller, successful home engineering in today's market should revolve around sustainability and energy efficiency—designs that he says increase the quality and livability of a home.

Energy efficiency is all the more essential given today's increasingly higher energy prices, and Miller says the market is rapidly moving in this direction. Indeed, even as the homebuilding industry has slowed, energy-saving designs and Green building have continued to expand each year, with more certification programs available and a greater number of builders embracing these practices. "It's like a snowball going downhill," says Miller. "Builders who do not get on board are not going to be competitive." Miller's Armory Park del Sol development in Tucson includes net-zero energy homes that combine masonry-based energy-efficient construction with solar energy systems and highly efficient appliances and mechanical equipment.

"With an energy-efficient home, it's possible to have a utility bill that is 50 percent lower than a home without those features," says Miller. "And, when utilities increase their rates, the rate increase ends up being less for homeowners with energy-saving systems in place. In that regard, it's like receiving a dividend on your home."

As energy efficiency and Green designs have continued to move into the forefront, consumer demand for these products and features has increased. "Today's buyer is very different compared to 10 years ago," says Miller. "In general, they are more sophisticated, more informed and have a much higher level of understanding when it comes to home designs and features."

Chris Miles says a big part of Green homebuilding and energy efficiency revolves around the indoor air environment. "Consequently, mechanical ventilation plays a significant role when it comes to home design," he says. "In fact, it is one of the top five most important things in residential building. It is becoming paramount to homebuyers. As a result, I am constantly working to find the most efficient way to bring fresh air in and expel stale air out."

Jeffrey Dinkle, president and founder of Atlanta-based Eco Custom Homes, says energy-efficient technologies are very important, but their application should be carefully considered based on cost-effectiveness. "If an energy-efficient



Proper sealing and insulation play an important part in engineering an airtight building envelope. These practices reduce heat flow and ensure a home will receive maximum benefits from energy-efficient features.

technology is not shown to have a payback within a five-year cycle, then most buyers are not interested. In terms of Green features—most buyers are interested, but there may only be a 2 to 5 percent premium they are willing to pay."

### PASSIVE SOLAR DESIGN

Homes built with site orientation in mind are designed to be adaptive and to work favorably with environmental factors and often do not cost much extra to include.

"Why fight against Mother Nature?" asks Dinkle. "Instead, use it to your advantage. Builders who are not conscious of this are only doing a disservice to their clients." Dinkle says homes can be built with passive solar designs often with minor costs. "In the South we limit south- and west-facing windows to prevent excessive cooling load in the summer. I also prefer eight-foot overhangs over each

**TODAY'S BUYER IS VERY DIFFERENT COMPARED TO 10 YEARS AGO... THEY ARE MORE SOPHISTICATED, MORE INFORMED AND HAVE A MUCH HIGHER LEVEL OF UNDERSTANDING WHEN IT COMES TO HOME DESIGNS AND FEATURES.**

door opening. This helps shade the hot afternoon sun and keep interiors cool.”

Proper site orientation works to minimize or maximize solar exposure, wind and shading opportunities to promote passive heating and cooling. However, Dinkle points out that effective site orientation designs will be different from region to region. “What works in Colorado may not work in upstate New York, and what works in Atlanta may not work in Miami,” he says. “The Steamboat condo I stayed in was designed with a large number of south- and west-facing windows. With a good amount of sun, we had our heat off most of the time and the interior stayed in the 70s.”

Clark Wilson, president and CEO of Austin-based Green Builders, says certain architectural styles can incorporate well with passive solar designs. In central Texas, his company is building Green master-planned communities with homes designed in Craftsman and Hill Country themes. “This type of architecture typically includes large overhangs or awnings,” says Wilson. “We can use this to our advantage by pushing windows underneath them. This, in combination with an appropriate site orientation, limits window sun exposure and decreases the home’s overall heat gain.”

### THE BUILDING ENVELOPE

With the ever-higher cost of energy, many builders are also recognizing the importance of engineering airtight, well-insulated homes. Proper insulated designs reduce heat flow and work to greatly enhance the effectiveness of passive solar design and energy-efficient technologies. They are an integral component to a home’s overall efficiency portfolio.

Jeffrey Dinkle builds high performance custom homes that incorporate a tight building envelope. “This is done with a superior housewrap over the exterior sheathing,” says Dinkle. “We also install high-quality, double paned windows, and all cracks, holes and crevices in the house framing are caulked, foamed and sealed. After drywall is installed, we caulk every crack between the drywall and electrical boxes.”

Dinkle also uses fire-retardant foam that seals every opening on the electrical boxes. “Just leaving a 1/8-inch gap around each electrical box is like having a 1.5-square-inch hole in the drywall. If a home has 400 electrical boxes, and none of them are caulked, this would be like leaving off 600 square inches of drywall in a home.”

**78% OF NEW HOMEBUYERS SAY THAT IF THEIR BUILDERS HAD RECOMMENDED SOLAR WATER HEATING, THEY WOULD HAVE SERIOUSLY CONSIDERED IT.**

Chris Miles agrees that engineering a tight house involves paying close attention to how the exterior is assembled. “In order to keep mold in check, I need to be very conscious of moisture prevention in addition to minimizing leakage. This relates directly to energy efficiency—making sure a home is sealed very well, but in a way that lets moisture escape,” he says.

Clark Wilson’s Green subdivisions will use state-of-the-art foam insulation on roofs and walls to reduce heat from the outdoors and seal homes for cleaner air quality. This also works to reduce pollens, molds and allergens. “We call this ‘sealed attic construction,’” says Wilson. “In Texas, the attic can become a hot, muggy place. When this happens, heat is transferred to the living area. Our goal is to include the attic in the thermal envelope of the structure, thus creating conditioned space for mechanicals and duct runs as well as eliminating the heat transfer of a traditional attic space.”

### HOMEBUYER LIFESTYLE

Builders are finding it more important to engineer and construct homes that are compatible with the lifestyle of today’s buyers. “Americans are busier than they have ever been,” says Chris Miles. “Because of their hectic schedules, they don’t have the time to maintain their homes. Consequently, builders are increasingly looking for products that will allow buyers to worry less about maintenance, such as fiber cement, synthetic products and other materials that are more durable and longer lasting. In the past, homes would typically need painting or exterior upkeep after only three to five years. [James] Hardie now makes prepainted products that are guaranteed for 15 years on the paint and 50



Before and after spray foam insulation was installed in this attic space for a tighter building envelope.

years on the siding. I look for products that are very durable with very long warranties,” says Miles.

In addition to being busy, Americans are now moving more frequently, as well as changing jobs more often as compared to the past. “In this regard, builders need to engineer homes from a marketing point of view,” says John Wesley Miller. “Resale value and buyer appeal is more important now than ever before.”

### WATER CONSERVATION

Homes built with designs and appliances that incorporate water conservation



For engineering the Bannister House, Chris Miles of GreenCraft Builders used a tyvek wrap on the outside that went up past the porch ceiling combined with foam on the inside. Miles says it was the tightest building envelope he has ever completed. HVAC bills for the 2400-sq.-ft. house are averaging about \$45 per month.

and cash rebates. Depending on the solar technology, the investment payback period can vary. However, by most estimates, solar hot-water systems typically have shorter payback durations than their solar counterparts, including photovoltaic panel systems.

Rob Singlehurst, product support and dealer training with Ontario, Canada-based EnerWorks says solar hot-water heating is the most cost-effective and efficient use of solar technology. EnerWorks develops and manufactures solar thermal technology appliances that are distributed throughout North America. The company's product will also be included in the upcoming 34-unit EcoLogic Subdivision in Newmarket, Ontario — Canada's first residential development with every home anticipated to meet the requirements for top LEED certification.

"Solar technologies are very important energy-saving components," says Singlehurst. "The industry is rapidly growing, with more interest being generated every year. Increasingly more builders are recognizing the value of solar and are incorporating it into their projects." According to national sample survey of recent homebuyers by the NAHB Research Center, 78 percent of respondents agreed that if their builders had recommended solar water heating for their new homes, they would have seriously considered it or would have wanted to learn more about it.

Singlehurst says even if solar panels are not initially included as a standard feature in a project, builders are still anticipating future needs by engineering and designing homes to be solar compatible, with south-facing roofs and steeper pitches to maximize southern exposure. "Builders are starting to shy away from homes with roofs that are flat or facing east because including solar at a later date could require more of a custom installation, which is also more costly. Builders are also including conduits in walls with attic space and roof penetration to further ensure that a solar upgrade is more of a standardized installation," says Singlehurst. ☐

measures are becoming more prevalent. Indeed, in the Southwest and other dry regions of the United States, ongoing droughtlike conditions are forcing many cities and municipalities to change the way they deal with stormwater management and water reuse. As a result, many water professionals and builders alike are recognizing the value of rainwater and are beginning to adopt and implement progressive thinking strategies for catchment, retention and reuse.

"In Texas, rainwater capture is becoming much more popular," says Miles. "Approximately 50 percent of our overall water usage is dedicated to landscape irrigation. So there is a real need to incorporate rainwater harvesting techniques in our building designs." Captured rainwater that is diverted to irrigating landscapes can help reduce potable water usage, thus lessening the impact on water supply.

"Everyone in Atlanta is interested in rainwater harvesting, including me" says Jeffrey Dinkle. "In my opinion, drinking water is too precious of a commodity to be used for outdoor uses. In regions

with about 50 inches of rain per year, a rainwater harvesting system can be designed to satisfy all outdoor irrigation, including car washing and pool filling needs."

In addition to rainwater harvesting systems, many builders are installing water conserving appliances such as low-flow appliances and dual-flush toilets. Some builders are also installing progressive graywater reuse systems that divert water from sinks and showers back to toilets for use in flushing. However, not everyone is behind these systems. "With the availability of low-flush toilets and low-flow waterheads, which greatly reduce a home's total water usage, gray water reuse systems are not cost effective at this time," says Jeffrey Dinkle.

### SOLAR TECHNOLOGIES

The use of solar technology in residential development has grown significantly over the past several years and is continuing to expand. Helping to drive this growth is consumer demand for environmental responsibility as well as a number of state and federal incentives such as tax breaks