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# BUILDING GREEN 101

Reduce, Reuse, recycle: a guide to sustainable design in this region's fragile landscape.

BY NICOLE GOLDMAN



This home was built using energy-efficient insulated concrete forms and built by Lobbys Real Estate Services.

It's hard to escape the roar of the green wave of architecture and design. Sustainable design, environmentally correct materials and building practices, and recycling are everywhere. Understanding how you can play your part, improving your

own home as well as the environment around you, is a puzzle with mountains of growing information. There are few basic guidelines to go by, however, and some selected ideas that may guide you through this territory.

It's all about impact. Reduce, reuse, recycle. These elemental tenets are the backbone to green living and building and can be related to the specific challenges and decisions you'll face when you build green.

Reducing relates not only to the quantity of materials you use, but also to the resources used—for instance, the harmful chemicals exposed in the manufacturing of building materials. One of the largest growing costs in construction is demolition and waste management. Whereas in the past a contractor would fold in his cost for carbon dumpsters into the general proposal, these disposal costs are now a line item that is often only estimated, as fires die every month. In renovation projects these costs can add as much as a to a percent to the construction budget. While this may seem a small figure it represents thousands of dollars simply to remove the old stuff before you can even begin to rebuild. Reducing what is discarded by reusing what you can, such as flooring, doors, windows, appliances, and plumbing fixtures will go a long way towards reducing these expenses.

Transportation of materials, and associated energy consumption, is another spiraling cost that can be managed by selecting materials and finishes from local manufacturers. Though bamboo flooring has been touted widely for its sustainable factors, its importance to realize that shipping from Asia uses a vast amount of fossil

fuel. Reclaimed flooring extracted locally from old factories, school buildings, and homes can be a better choice for reducing fuel use, since it requires little transport and makes excellent and beautiful use of old wood that can be refinished for traditional or contemporary homes.

Reducing toxic materials used in manufacturing contributes to a cleaner environment and is at the heart of building green. Many homeowners do not realize the content of the materials used in the construction of their home. Some learn about it the hard way when family members develop allergies or breathing problems. Wall-to-wall carpeting is probably the most notorious material familiarly known for its off-gassing, but this can also be the case with various fiberboards that are used in cabinetry and finish carpentry. Ask your contractor to avoid boards plywood for any carpentry, including use as an underlayment for flooring. Urease and some other fiberboards and plywoods are manufactured with formaldehyde-based adhesives. These materials off-gas and are a proven eye, nose, and throat irritant as well as a possible carcinogen, according to The Green Guide Institute, an independent research organization in New York, and

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"It's a moral imperative for us to reduce our CO<sub>2</sub> emissions," says Chris Warner, "and the way to do this is through reducing our energy use. "Energy is the number one buzz word in the sustainable movement," he adds.



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can create particular problems for the very young or old.

"The real grail is the roof, and far and away the most important action you can take is insulating and tightening up your home to reduce overall energy consumption," advises Chris Warner of Chris Warner Architects in Woods Hole. "It's a moral imperative for us to reduce our CO<sub>2</sub> emissions," he adds, and the way to do this is through reducing our energy use. "Energy is the number one buzz word in the sustainable movement," says Warner.

There are plenty of viable methods for reducing your energy use. Warner, along with many other architects and builders in the area, such as ABE Archi-

tect and contacts) and is available through a national network of architects and dealers.

ABE renovated a open ranch in Barre, Vt., where they added a second floor. By doing so, they were able to install a continuous layer of insulation along the exterior. The best time to insulate is during a renovation, and it can make a significant difference in the energy efficiency of the home.

Tightening up your existing home can be accomplished through new treatment and can be aided by plugging air leaks around windows, doors, and any other wall penetrations, such as where hoses, vents, and meters are attached. "Plugging these leaks with weather-stripping and caulk can be a simple task for anyone," suggests Emily Mitchell, LEED for Homes Assis-

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tant Program Manager at the U.S. Green Building Council in Washington, D.C.

You may also want to get an energy audit to determine the weak spots in your energy program. It's a better bet to go with a firm, such as Building Diagnostics (<http://www.bldgdiag.com>) here on the Cape, than with one of the utility companies, since Building Diagnostics will do a blower test—to really determine where your air leaks are. The most important thing is to implement their suggestions, such as caulking, or replacing or repairing windows, wrapping hot water heaters, and ducting. Simply getting the

text in Barre, promote the importance of properly insulating a house, whether during new construction or renovation. Homeowners can also address remodeling their homes even if a renovation project is not underway with blown-in foam insulation. Steve Alford at ABE suggests a foam-in-place insulator called Icynene, an RCTC-free, open-cell polyurethane, (<http://www.icynene.com>) though cautions it is hazardous during installation. Alford has recently discovered a soybean insulation from Biofoamed Insulation (<http://www.biofoamed.net>) that is LEED certified (see sidebar on key terms

might does not help reduce anything except the contents of your pocketbook.

Another way to reduce your energy consumption is to replace old appliances, HVAC systems, and lighting with EnergyStar® products (see sidebar). These products have been tested for their energy efficiency and stand off hundreds of dollars annually from your electric bill as well as worth the upfront expense.

Bob Evans at A+E Architects says he has experienced a growing number of requests for reductions in the overall square footage of homes from individuals concerned with their energy footprint, as well as from baby boomers looking to downsize and simplify. Smaller homes mean a reduction in the lifecycle cost of the building. According to Chris Warner, only 15 to 20 percent of the cost of a building goes into the construction, with the balance coming from running the home over time. He warns homeowners to "Make energy the priority."

Evans and his team also try to create smart sites that are in keeping with the size of materials, such as plywood and framing boards, in 2' increments, which he says "cuts down on the waste during construction." He also cautions on reusing as much as is practical. Sometimes trying to use old materials however can be unwise from a labor cost standpoint. But if you can reuse flooring and existing studs and framing try to do so. On another A+E project where they were doing a restoration of an old sea captain's house in Chatham, they were able to reuse the existing rafters and had new cellulose insulation blown in to make the shell weather tight.

Start thinking green in the design phase of any project. That is where you'll

be able to specify the types of materials you want to use, and can locate recycled and local sources. Though world famous architect Bill McDonough ([www.mcdonoughpartners.com](http://www.mcdonoughpartners.com)) claims that "being less bad is not being good," if homeowners begin to make adjustments to their requests, and architects respond with specifications to builders for greener practices, we will all be improving our environment and our impact across the board. You have to start somewhere.

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