



Top 15 Green Building Ideas

Introduction

Green buildings are healthy buildings for the occupants and the environment. They are also economical buildings, boasting reduced energy, water and maintenance costs. However, constructing or renovating homes in an environmentally responsible manner requires a great deal of planning, as well as educating and prodding architects and builders to seek greener materials and construction techniques. While their resistance may at times seem formidable, it is achievable and worthwhile.

There are hundreds of building techniques and products to integrate into a green home. The most important consideration is balancing economic and time input with economic, personal and environmental benefit. Below you'll find 15 smart ideas to start planning:

- **The Right Lot:** Take great care and time in picking the right lot that will allow you take advantage of the natural gifts of sun, wind, soil, water, views and community services, while at the same time reducing the harmful sides of all of those gifts. As you shop for lots, but well before you irrevocably fall in love with a bad one and buy it, hire a builder to let him/her see it and then give you some experienced advice on what it will cost to build on this lot versus others. You could easily save tens of thousands of dollars and many years of aggravation by paying someone for their inexpensive consulting time for this invaluable service. For example, depending solely on your lot, a septic system could cost \$5,000 or \$50,000 and the same again for a foundation, but once you buy the lot, you're stuck with the outcome. Ideally, the best view (where you would typically put a back patio or porch) should be to the south. It is easy to design overhangs for good sun control on the south side of the house, since the sun path is high in summer and low in winter. You have limited control on the east and west sides, summer or winter. North views are fine if your climate isn't too cold and windy in the winter.
- **The Right Building Team:** Choose your architect, builder, subcontractors based on their training and experience with green techniques so that they can deliver you a superior home. (See fact sheet no. 4, *Choosing a Green Building Professional*)
- **Work with Your Climate (Orientation and Shape):** Specifically design shading for where you

want it in the summer (with trees, covered porches, roof overhangs, window awnings) and let the sun in where you want it in the winter. Install low-E (emissivity) windows to reduce the harmful effects of the sun in summer, but also retain the heat inside the home in winter (look for the NFRC label to get the performances you want). For a warmer climate, a long rectangle shape with the short ends facing east and west will suffer the least from the hot sun, while a southern exposure will provide lots of light without much heat gain. This shape also works best for cross ventilation. For a colder climate, a squarer, compact shape that holds the heat in and provides the least amount of exterior wall space works best. Two story homes work well for encouraging natural ventilation in which hot air rises from the first floor up the stairway and exhausting out of a skylight or window at the top of the stairway.

- **Quality and Durability vs. Size:** Build or buy a house that's the right size for your family now as it increase/decreases in size. Remember, you have to furnish, clean, maintain, heat and cool, and insure the whole house. Smart design can make a smaller house feel bigger and bad design can make a big house seem cramped. More size does not necessarily mean more service to the occupants. Having a bit smaller home can allow you to add quality products and practices to your home (like a smaller diamond versus a larger rhinestone).
- **A Good Shell:** Use a high quality "total fill" type of insulation that completely fills the void in your walls (i.e. blown-in fiberglass, cellulose or foam). Foam, caulk and weatherstrip every penetration and crack to avoid air infiltration that compromises the energy efficiency, comfort, and indoor air quality of your home. Have your home professionally tested with a "blower door" to see how leaky it is (seek a goal of <0.40 air changes per hour).
- **40 year Roof:** Don't skimp on your roof (your hat) because failures in it can destroy all that lies below. Install a tile, metal or 40-year composition shingle roof that will ease your fears about deterioration and leaks. Tile and metal can save you energy, can be used safely for rainwater collection, and may also qualify for reduced homeowner insurance.
- **Natural Ventilation:** Design and place windows for good cross ventilation, taking full advantage of prevailing breezes. Plan for windows on two sides of a room whenever possible. Use ceiling fans to move air and consider a "whole house" fan as well.

- **HVAC system:** Get a high-efficiency (13 SEER, 90% AFUE) and computer calculated “right-sized” equipment (ask for an ACCA Manual J calculation) based on the design, construction, and orientation of your house. If your equipment is oversized, you will be buying more than you need, it will be noisier, and it won’t stay on long enough per cycle to run efficiently. During humid times, it won’t have time to dehumidify the air. Make sure duct runs are as short and straight as possible and ducts are sealed airtight with mastic (not duct tape). Ask to have your ducts professionally pressure-tested and seek a goal of under 10% leakage (nationally on average, ducts leak 30%). Install a pleated-media filter (rated at MERV 6-12) to help the equipment last longer and improve indoor air quality for the occupants.
- **Indoor Air Quality:** Install hard surface flooring (wood, cork, concrete, tile, linoleum) as much as possible. They are durable, easy to clean and won’t harbor mold, dust, dust mites, and other allergens. Minimize carpet (because it holds the allergens and offgasses chemicals) and vinyl products (because they offgas chemicals). Use low or no-VOC interior paints and finishes (under 150 grams/liter). Exhaust odors and humidity with fans in the bathrooms and kitchen. Keep fresh air coming into your home with windows, a whole house fan or with a mechanical ventilation system.
- **Appliances:** Purchase ENERGY STAR® labeled products such as light bulbs, refrigerators, dishwasher, clotheswasher, fans, air conditioners, dehumidifiers, home electronics, office equipment, etc.
- **Lighting:** Use compact fluorescent lights, motion sensors, daylight sensors, dimmers whenever possible to reduce energy use. When using recessed can lights use only the IC-AT type. Learn about the different types of lights (incandescent, halogen, fluorescent, metal halide, sodium) how to use them for different purposes (ambient, task, spot and security lighting).
- **Water:** Purchase water-conserving appliances (dishwasher, clotheswasher, on-demand water heater) and plumbing fixtures (showerheads, toilets, faucets, recirculation systems, etc). Use efficient irrigation systems (drip irrigation and rain/moisture sensors) and use native plants that require very little watering.
- **Durable and Low Maintenance Exteriors:** Use durable siding materials such as fiber-cement siding to eliminate rot and reduce the need for painting. Use wood/plastic composite deck materials to reduce the need for the annual resealing.
- **Landscape:** Use trees and shrubs for shading, cooling, oxygen, wind protection, noise reduction, and privacy. Keep plants away from the home’s foundation and plant them with space to grow to maturity. Choose plants that are native or well adapted in your area. Plant turf grass varieties that need the least amount of water, and are best for the amount of sun they will get. Make sure landscaping has plenty of topsoil and organic mulch. All of these practices will also reduce your need for fertilizers and pesticides that can harm your family and pets, and our waterways.
- **Reduce, Reuse, and Recycle:** Reuse by getting organized and removing the clutter – simplify your life. You may also consider reusing building materials (wood floors, doors, etc) in your next project. Recycle by using material high in recycled content such as engineered lumber, fly ash concrete, steel, recycled tile, cotton or cellulose insulation, etc. You may also install a rainwater collection system to use rainwater in your landscaping.

For More Information

- For more information about Green Building, visit our website at: www.greenaffordablehousing.org or call Bruce Mast at 510-271-4785.
- Search the **Materials Database** from Bay Area Build It Green to find local suppliers of green building products and services provided: www.build-green.org

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