Building Green

The Top Ten Things You Can Do to Make Your Home or Office Environmentally Friendly

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#1
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BUILDING GREEN:

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Energy crisis notwithstanding, environmentally friendly building design has been a hot topic in many areas of the country for decades. Texas, California and our neighboring state, New Jersey, have all passed laws to encourage energy conservation in homes by offering healthy tax rebates. For example, homeowners in Texas get a 70-80% tax rebate when they install solar collectors in their home. Pennsylvania home-owners currently get only the utility savings that come from such an installation. The state provides no additional incentive.

So why consider environmentally friendly design in your home or office? Do the benefits truly outweigh the costs? The answer of course is subject to individual interpretation, but in today's world of rapidly depleting existing energy sources, any move-ment towards conservation will pay off to someone in the long run. In addition, there are many common sense approaches that can generate more efficient use of the environment if we just pause long enough to give them their due consideration.

At the annual convention for the American Institute of Architects (AIA) held from May 15-17, 2008 at the Boston Convention and Exhibition Center, one of America's leaders in the building of environmentally responsible residences, Peter Pfeiffer, FAIA, Austin, TX, addressed the topic of "Green Homebuilding by Design." He drew upon over thirty years of building green to address some of the pitfalls architects face in executing green

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#2

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#3

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#4

Use overhangs and shading for cooling and keep your air conditioning at 78°.

design. Although much of his talk addressed technical issues, much of what he said bordered on plain common sense.

Based on a combination of our experience and his inspiring remarks, we have developed the following top ten things you can do to make better use of the environment when designing your home or office. Some can be retrofitted into an existing structure; others would require new construction or major rework.

1. **Reduce energy consumption.** Conservation can easily save more energy than all the special renewable products and systems you might install. For instance, newer EnergyStar® appliances use less energy than their older counterparts. Older refrigerators and freezers are notorious for burning up energy needlessly. Simple things like light bulbs can make a difference. The newer compact fluorescent light bulbs may cost more than their incandescent counterparts but use far less energy and last up to ten times longer.
2. **Place your building on an East-West longitudinal axis.** This placement gives maximum southern solar exposure allowing solar radiation to stream into your home through the south facing windows. The natural solar radiation heats your home comfortably throughout the day. Deeper roof overhangs can shade unwanted summer sunlight when the sun is higher in the daytime sky, yet allow the winter sunlight to penetrate deep into the room in the winter months.
3. **Locate the kitchen on the southeast corner to receive the morning light.** The sun rises in the east, swings upward in the southern sky, and sets in the western horizon. Everyone enjoys drinking their first cup of coffee as the sun's warming rays just begin to pop above the horizon and brighten up the wakening house. You can

#5

Locate a detached garage on the northwest corner of your property to block western radiation.

#6

Install proper duct work to conserve energy and improve air quality.

enjoy this experience yourself, weather permitting, when you position the kitchen in the southeast corner of the house.

4. **Use overhangs and shading for cooling and keep your air conditioning at 78°.** Using the natural shading that occurs from window overhangs and permanent awnings does much to keep your building cooler saving on air conditioning costs. Having a porch also protects that part of the house from the sun's heat while allowing natural light still to filter through. Research has also shown that keeping air conditioning set below 78° can cause respiratory problems due to the lower dew point, and also produces a better environment for molds and mildew to grow.
5. **Locate a detached garage on the northwest corner of your property to block western solar radiation.** This location also eliminates the volatile organic compounds often found in garages from entering the atmosphere of your home. You don't sleep with your car, why would you want the noxious fumes associated with it being dispersed throughout your home.
6. **Install proper duct work to conserve energy and improve air quality.** One of the easiest ways to conserve energy and improve air quality is to have a tight house. The ducts you find throughout your house are a major culprit in air leakage. If your clothes dryer has a flexible duct, replace it with a hard ducted metal one. Twice as much air will flow through the metal duct making the dryer more efficient and you won't have the hot air and lint residue escaping into your laundry area. Exhaust fans in the kitchen and bathroom should also use a commercial grade duct system to maximize effectiveness and have all joints taped. Placing the fans on timers also increases their effectiveness. It is also important to balance these exhaust fans as they can depressurize the house, replacing the air with that from the chimney or

#7

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#8

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garage leading to poor air quality throughout the house.

7. **Insulate your house with spray foam.** The traditional fiberglass batting used frequently for insulating purposes is not as effective as you would want, as the gaps at the edges of the batt reduce performance by 25-50%. You should use the more expensive closed cell foam for the first inch of coverage, and the spray the remainder of the depth requirement with open cell foam, which is much cheaper. Spray foam is particularly effective on attic roof rafters and the underside of the roof decking. Insulating your attic in this fashion reduces the humidity in your home, keeps your attic and your air ducts cooler and allows for cleaner storage.
8. **Build in water conservation methods wherever possible.** For those with landscaping installations, you can use up to 15,000 gallons of water per month. By building in hydro zones you can reduce that usage to 3,000 gallons per month or better still, consider xeriscaping, where plants appropriate to the region are emphasized and water evaporation minimized. Similarly, certain appliances are now built to conserve water, such as a front-end loading washer, high performance toilets and conservation fixtures.
9. **Consider placement and types of windows based on solar orientation and prevailing winds.** Windows account for 27% of the average heat loss in a building. Therefore, it is important to recognize that not all windows are created equal and that they should be positioned where they can optimize solar heat and minimize heat loss due to wind. Higher grade, double pane, gas-filled windows are more suitable where they are needed to fend off high winds. In addition, although Low-E glass is considered an industry standard, it is important to remember that it does cut out the blue spectrum of light, often leading to the depression that results from lack of exposure to the the full spectrum of light.

#9

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#10

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10. Get the right pump for your pool. If you have a swimming pool it is the largest appliance you have. The pump runs 8-12 hours a day, so making sure that pump is efficient can save you as much as $75/month.

Certainly there are material considerations for actual construction that also come to play in building green. Sustainable harvested lumber, alternative building materials, adhesive rubber flashing around windows are just some of the products available that you can discuss with your architect or builder. The most important thing to remember is that 90% of all savings can happen in the first 10% of the design by implementing the simple steps outlined in our top ten.

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