



## How green architecture can impact energy consumption

by John McDevitt

You may be surprised by the many ways green architecture can impact energy consumption. Green architecture has a positive impact on energy use throughout the life of the building, and can also save significant energy during design and construction. It takes energy to make a Building, more energy than you might have thought. Every material used to construct a building has energy locked into it. This "embodied energy" is the energy it takes to extract, fabricate and transport materials to the building site. "Embodied energy" also accounts for the energy added during construction and finishing. Did you know it takes 127 times more energy to manufacture aluminum than it does wood? That steel needs 24 times more energy? The good news is that building materials manufacturers have realized that the green architecture train is leaving the station and they are scrambling to climb aboard. More and more cost effective, energy efficient and environmentally friendly building products are coming into the marketplace. Green architects have real choices now. Using local materials when possible is another, practical way of conserving energy. This practice doesn't just save transportation costs, it can have positive effects on the local economy as well. The green architect incorporates both passive and active features into the building and site design that will save energy over the life of the building. \* Sensitive on site placement of the building can take advantage of natural features while preserving them. Prevailing winds can be tamed for natural cooling and ventilation. The building can turn it's back' on the cold winter winds, sheltering the occupants. \* Careful positioning of windows and shading devices admit and control natural lighting. They exclude unwanted solar heat during the cooling season and welcome that same solar energy for heating in the winter. \* When trees and other vegetation are preserved, they not only enhance the beauty of the site, they can supply energy saving shade in the summer and help block cold winter winds. \* Well balanced cut and fill not only preserves the environment, but moving soils only on site conserves the energy that would otherwise be wasted trucking cut and fill off site. \* Water saving devices such as low flow toilets and showers indirectly save energy required for treating and pumping water. And rain runoff can be saved and directed for irrigation. Who needs sprinklers anyway? \* How about the traditional green lawn? There's another energy waster, not to mention being the most labor intensive landscaping ever devised. Clever landscaping can replace all or part of a lawn with attractive, low maintenance plantings. Here are just a few examples of active energy saving devices green architects can incorporate into their design: \* All, if not most hot water needs can be met with rooftop solar hot water heating systems. \* The costs of photo voltaic panels continues to come down, making solar power generation an economic reality. In fact, Open Energy, a relatively new company is offering a range of solar building materials: commercial flat-roof PV in a single-ply membrane; a residential solar roofing tile; and photo voltaic architectural glass with solar cells laminated inside. \* Geothermal heating and cooling systems. Geothermal systems sink a loop of pipe several hundred feet into the ground vertically where the earth maintains a constant temperature year round (about 57 deg F). Geothermal systems take advantage of this by circulating a refrigerant that either transfers building heat to the earth during the cooling season or extracts heat from the earth during the cold months. These systems typically cut heating and cooling energy costs by 25%. The days of cheap oil and disposable energy are long gone. Green architecture gains momentum every day and will have a real impact on our energy consumption.

*Copyright © 2002-2009 Helium, Inc. All rights reserved.*