

Greening your home 101

by Bruce Glenn

The Green Builder

Terra Sol Eco Homes

Going green and being green are popular buzz words right now. Most recognize that green efforts are important, but implementing them may seem daunting. With minimal effort and some financial investment, greening your existing home is much easier than you may think and local eco-designer – builder Bruce Glenn of Terra Sol Eco Homes of Port Townsend tells you how.

It took me a long time to come to the realization that building a new home or structure is not necessarily the most sustainable thing to do. Even when building with straw and natural building materials that have a low to zero embodied energy cost.

Reinvigorating our urban areas by rebuilding and greening existing homes, offices, and buildings to be more energy efficient, healthy and environmentally sensitive to the earth's cycles is the start to a more ecologically sustainable lifestyle. Reclaiming environmentally damaged land from industrial and commercial uses, providing city parks, bike paths, in city and county wildlife habitats are all part of restoration. But, more importantly, these measures reconnect us to our natural habitat everyday. So how do I apply this to myself and family? Green the home you are in!

First, determine if your house has the potential for you to put the time, money and effort into making it a greener, healthier energy efficient home.

Secondly, conserve energy. Do you feel a draft in winter? Weatherize your home, insulate the attic first, and then walls and floors if they need it. Repair and replace windows and door seals. Review your electrical consumption. Do you have efficient appliances, lighting and natural light? If you have those beautiful, old double hung true divided lite windows, add storm windows and insulate around the window frame. If you are looking to replace with new windows, Puget Sound Energy currently offers a \$500 rebate on seven or more Energy Star® windows.

If you have a good southern exposure, a new window or door on the south or west side might be a perfect addition. Build an attached sunroom and enjoy our cloud-filled skies at the same time that you bring free heat into your home.

You may need to add a little more thermal mass in the form of tile, stone or other materials on floor or interior walls.

Solar thermal hot water tubes or panels for your hot water systems do work in our area about seven months of the year. Solar thermal hot water systems pre-heat your domestic

water before it goes to your water heater. The payback takes around seven years depending on the type and cost of solar system that you purchase.

Photo Voltaic (PV) panels are a renewable form of electricity, widely gaining ground around the world. The panels are crystalline cells that generate electricity from the sun's direct radiation with no pollution. Like passive solar energy here in the Northwest, we store the electricity generated back to the power company and gain electrical credits to be used when the system does not produce enough energy during the winter months. This is called spinning your meter backwards. There are federal tax breaks for both solar thermal hot water systems and PV panels.

A green passion

Ever since reading my first Adobe Journal Magazine in the early 70s, along with Ed Mazria's book Passive Solar Energy Book, I have had a passion for passive solar homes and an energy-efficient lifestyle.

Passive solar really got me excited about designing with the sun's cycles in the midst of the first energy crisis.

In the past 30 years I've designed and built many different types of healthy, passive solar home structures in different climates, with the goal of reducing the heating and cooling expense by using the sun's radiation.

Some examples of using different wall systems include:

- ? conventional 2x6 walls with an interior foam layer?*
- ? super insulated double wall systems (R-40)?*
- ? post and beam with straw bale as an insulation infill (R-50)?*
- ? passive annual heat storage PAHS (a concrete dome that uses the earth as a storage bank for the sun's radiation, similar to earth bermed homes)?*
- ? rammed earth?*
- ? adobe ?*
- ? ICF insulated concrete forms for foundations and structure?*

I have also built using traditional earth materials such as clay, sand and straw. Cob is a mixture of heavy clay and straw rolled into a large roll like a loaf of bread and parged onto itself forming an earthen wall. Light straw clay (light clay slip mixed with loose straw) is packed in forms between a timber-framed structure finished with plaster interior and exterior.?

About 15 years ago I started designing homes in Durango, Colo. because I was frustrated and tired of seeing the same Mac Mansions built without any consideration to how the house interacts with its environment. I wasn't interested in designing and building those

kinds of monstrous homes that I felt wasted our resources with excessive construction and the expensive overhead in heating and cooling them.

It's about life cycle cost from cradle to grave, so we need to consider how much energy is incorporated, in the building or product.

Living in the Pacific Northwest exemplifies the importance of maximizing the southern orientation of the house to capture every bit of sunshine. In Port Townsend it means a darker, wetter, colder environment. The houses tend to be in shaded positions blocked by trees, building, hillside, casing shadows over the southern side of house.

A common misperception is that passive solar energy does not work in colder, cloudier climates. That is false. Passive solar does work in supplementing our annual heating requirement. We do have to heat our homes during the winter season, but three passive solar homes in Port Townsend, Sequim and Port Angeles all stayed around 60 degrees on cloudy, wintry days with no heat and will heat up to 75 to 80 degrees on sunny days. All of these homes store the sun's energy in thermal mass materials (rock, concrete, tile, stone, adobe, water) by capturing the sun's radiation during summer, fall and spring for winter time use.

The Lighting Design Lab of Seattle has determined that people need a minimum 10,000 lumens of natural sunlight 20 minutes per day (cloudy or not) before 10 a.m. to offset the SAD syndrome, seasonal affective disorder. The day light gain especially during our cloudy winter season plays a huge part in keeping a positive attitude.

Natural lighting is one of the most important by-products of passive solar design in terms of cost benefit.

Bruce Glenn, the green builder operates Terra Sol Eco Homes LLC in Port Townsend. He built the first permitted straw bale home in Colorado in 1995. He is past chapter president of the Northwest Eco Building Guild. For a green home consultation, design or building service.

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