Living Green *on the* Coast

One of the few bright lights in the housing market is being emitted from green homes, those new and remodeled dwellings designed to be earth friendly and durable.

BY NATHAN GOOD

The weather along our coast is tough on our dwellings. Seventy to ninety inches of rain per year is not uncommon. High winds pound horizontal rain at the sides of our homes. Our salt-laden air silently chews away at exposed metal surfaces. Water and vapor slither into our homes to launch colonies of mold. Earthquakes, tsunamis and fires patiently wait their turn to deliver unexpected threats to our structures. Some of the key characteristics of green homes relevant to our coastal conditions include design and construction for durability, reducing energy use, and improved indoor air quality. There are many strategies that you can use to improve the durability of your home, reduce utility costs and enhance indoor air quality.

David Papazian

If you're serious about your home being earth friendly, one of your first considerations should be its durability. A home designed and maintained to last 100 years or more enables the cost and environmental impacts to be amortized over a longer period of time. When we double the life of a building, we reduce the environmental impacts associated with its construction by half. A durable residence usually requires less maintenance. The added investment in durable materials and design is small in comparison to the impacts and costs of shoddy construction and cheap materials.

There are many things you can do to improve the longevity and durability of your home. Design generous roof overhangs to protect the exterior walls from all but our horizontal rain. Create drainage planes behind the exterior siding, known as rain screens, that help keep moisture out of the exterior walls. Use proper flashing and sealing around windows and doors, as this is one of the most common locations for rain to penetrate into the walls. Limit the use of metals outdoor, as the salty coastal air is highly corrosive. Install adequate waterproofing and drainage around the foundation. Use protruded fiberglass windows, which will usually last longer than vinyl and aluminum window frames. Install robust and effective gutters and downspouts to divert rain water away from the perimeter of the home. Keep firewood away from the home to reduce the chance of pests and wood rot from entering the home. And finally, select experienced builders who have a proven track record of building durable homes along the coast.

Reducing Energy Use

Our climate along the coast is generally mild compared to the rest of the country, with annual temperatures averaging between 45 and 60 degrees, only a fifteen-degree temperature swing. As the majority of our days from November to May are cloudy and partly cloudy, we treasure the sun.

We strive to use the sun as a heat and light source to the fullest extent. Passive solar design is possible along the coast, yet requires careful design and the occupant's use of insulated window coverings so that heat is not lost during nights and overcast days.

Greg Kozawa

While a little insulation goes a long ways on the coast, it's not enough. Substantial savings in energy and thermal comfort can be achieved with enhanced insulation to our roofs and walls. Target insulation values of R-30 for walls and R-50 for roofs. Design thermal breaks between the inside and outside of the exterior walls and roofs so that heat is not lost through the wood framing.

We advise our clients to invest in the best windows they can afford. A typical window specification from our office for a home on the coast includes protruded fiberglass frames, double or triple pane glass, "u" values less than .30 (the measure of a windows ability to resist the transfer of heat), a low-e coating on the inside layer of glass, and the use of argon gas inside the two panes of glass.

Our coastal climates are near ideal for the new generation of heat pumps, especially the ultra-efficient models that deliver heat, ventilation, and on those rare days when we need it... cooling. Homes with inexpensive electric baseboard heaters may benefit from the addition of "mini-split" ductless heat pumps. These wall-mounted units are a clever way of providing energy-efficient heat, ventilation, and cooling to homes that lack heating ducts. The new heat-pump water-heaters emerging in the market will revolutionize how our hot water is created for domestic uses and radiant heating.

There are few energy-saving strategies as inexpensive and effective as the

replacement of incandescent light bulbs with compact fluorescents. For a fixture that is frequently used, the added cost in replacing an incandescent light bulb with a fluorescent one can be recouped within a year from the energy saved. The color quality and dim-ability of compact fluorescent light bulbs has improved substantially over the past eight years.

Most of our clients benefit from the financial incentives associated with the energy-saving devices within their new or existing homes. A sampling of energy-saving elements that are often candidates for financial and tax incentives include new refrigerators, clothes dryers, dishwashers, water heaters, high-performance windows, enhanced insulation, and heat pumps. Most homeowners will find themselves candidates for robust financial incentives associated with solar-electric "PV" systems, including federal and state tax credits. (see sidebar for financial incentive sources)

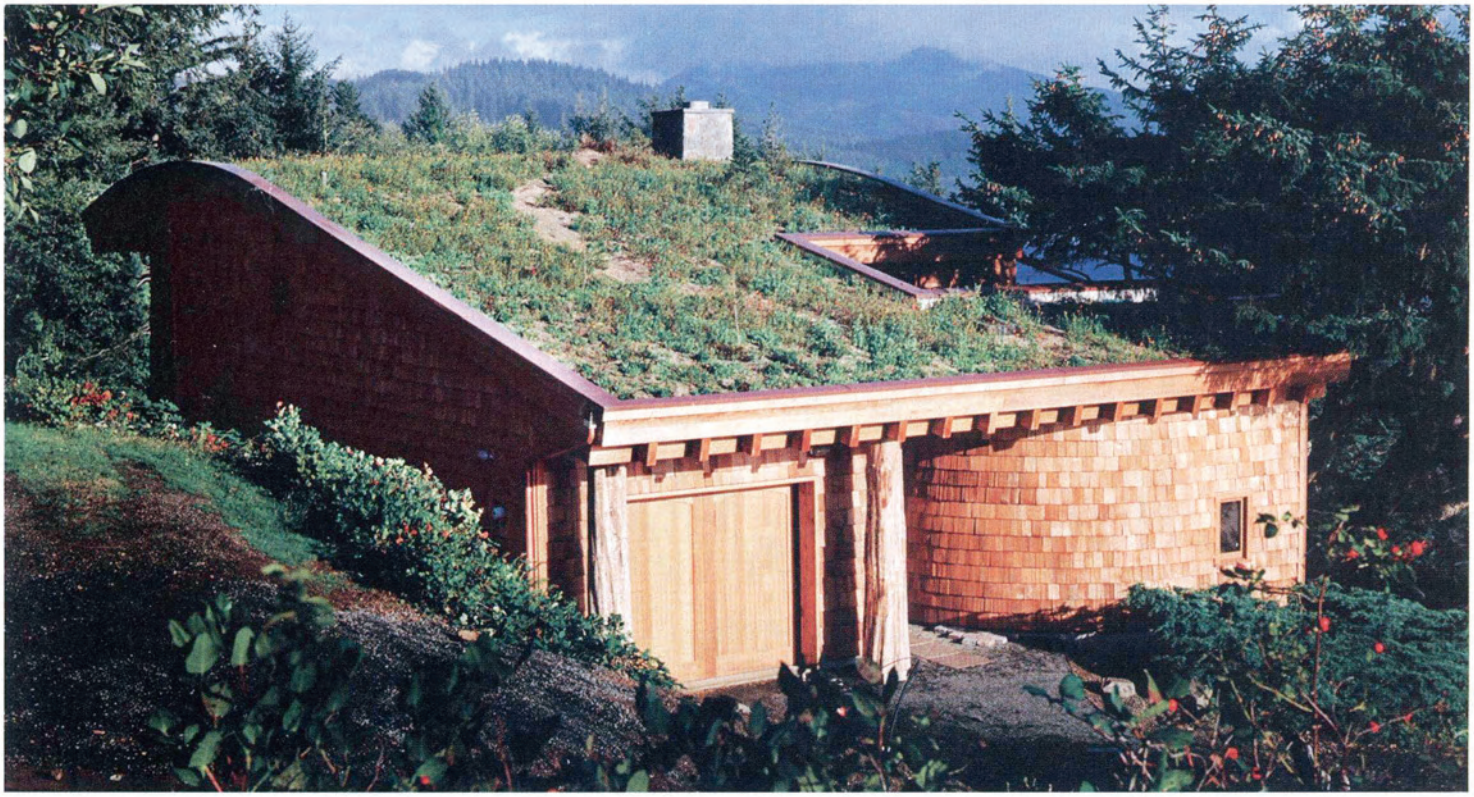
Despite the dominance of overcast skies, solar-electric "PV" systems are an effective way for homeowners to generate their own electricity along our coast. Many residences are silently generating and selling electricity back to their electric utility company. Vacation homes with only occasional use have the potential to generate more electricity than they use on an annual basis.

Enhanced insulation, high-performance windows, sealing air leaks, energy-efficient lighting and appliances, and utilizing the new generation of heat pumps are usually more cost-effective than the installation of solar-electric systems. As one of my colleagues puts it, "Eat your energy-efficiency vegetables before indulging in your renewable energy dessert".

Indoor Air Quality

One of the pillars of green building is creating and maintaining a healthy indoor environment for a home's oc-

The techniques to green one's home are as diverse as the occupants. Green homes, like the Manzanita residence pictured top left and the Devil's Lake residence pictured above and on page 55, take advantage of energy-saving high-performance windows and generous overhangs to protect exterior walls. Insulated Concrete Forms (lower left) are an innovative component of a "deep green" home.



Greg Kozawa

Vegetative roofs are one of many components that make a "deep green" home. Designed to generate as much energy as it consumes, the Cannon Beach home pictured here takes advantage of southern solar exposure as it pursues the goal of being a "net-zero-energy" residence.

cupants. Poor indoor air quality is a constant threat for coastal residences, with mold and mildew being the prime suspects. Household mold is a culprit in asthma, sinus infections, and weakened immune systems. Mold loves our coastal climate when the humidity is over 60% with temperatures above 50° F, especially in places where there is little or no air movement.

A good ventilation system becomes even more important as we tightly seal homes for energy savings, durability, and comfort. We use mechanical ventilation systems for all of our new and remodeled homes along the coast, even those with passive solar and radiant heat systems.

We advise our clients and their builders to avoid all products (and furniture) that outgas unhealthy chemicals into the home. Many building products emit Volatile Organic Compounds, known as VOCs, and urea-formaldehyde, both of which can be harmful to our respiratory systems, especially those of small children. Urea-formaldehyde is commonly found in adhesives, plywood, particleboard, and fiberglass insulation. VOCs are prevalent in paints, adhesives, and vinyl flooring. Dozens of manufactures have recently switched to products that are free of urea-formaldehyde and VOCs. It's worth the research to find them.

Despite the comforts of carpet, our clients are migrating towards hard flooring surfaces in order to reduce mildew and dust mites. Area rugs over tile and wood floors are a good compromise.

Heat Recovery Ventilators (HRVs) are an energy efficient way to add ventilation to a new or existing home, especially those that utilize radiant and electric-resistant (baseboard) heating systems. HRVs capture the heat from a home's exhaust air and transfer it to the incoming air. Mini-split heat pumps are an asset in improving residential indoor air quality.

There's more to creating a green home than durability, energy efficiency, and indoor air quality, but those are three of the key ingredients for our coastal environment. Green homes will usually include strategies for water savings, locally sourced products, and the use of materials produced with recycled content. Deep green homes may include rainwater harvesting systems, vegetative roofs, and the use of innovative exterior wall systems like Insulated Concrete Forms (ICFs) and Structurally Insulated Panels (SIPs).

Green building ratings systems pro-

vide homeowners with a framework for achieving certifications based upon demonstrated performance. A number of our homes, including those of our design in Neskowin and Cannon Beach, have achieved the Earth Advantage certification. One of our new homes in Neskowin is on track to achieve the US Green Building Council's LEED certification. We find green building certification programs a helpful mechanism to educate our clients, their builders, and the host of subcontractors on green building concepts and applications. (see sidebar for a list of green building certification programs)

The costs associated with the techniques to green one's home are as diverse as the occupants. Inexpensive techniques to start greening one's home include the use of compact fluorescent light bulbs, installing a programmable thermostat, using water-saving shower heads, adding timers for bathroom exhaust fans, and scheduling annual inspections for water intrusion. Installing new Energy Star rated appliances, water heaters, and heat pumps are mid-range green improvements. Supplementing a home's insulation, replacing windows, and adding a new forced-air heating system will be more expensive and disruptive.

Coast dwellers tend to be nature lovers, so it comes as no surprise that homes along our Northwest shores are strong candidates for sustainably designed homes. Our mild climate is compatible with designs to rely upon the sun for comfort and energy. Locally sourced wood from sustainably managed forests will provide an abundance of quality wood for generations. A plethora of environmentally friendly products are being introduced each week. At our fingertips await dozens of informative resources on green buildings... happy browsing.

Nathan Good, AIA (pictured above) owns an award-winning architectural design firm specializing in residential and select commercial design projects that combine character and aesthetics with a focus on environmental responsiveness. Good was awarded the "Custom Green Home of the Year" by the National Association of Home Builders for one of his Oregon coast homes.

Green Resources

Greg Kozawa

Green Building Certification Programs

Earth Advantage (www.EarthAdvantage.com) is one of the first green home certification programs in the US. The Portland-based organization has certified thousands of homes on the West Coast with their simple and inexpensive system.

LEED for Homes (www.usgbc.org) is a program of the US Green Building Council. It consists of a robust point-based system with four levels of certification: certified, silver, gold and platinum. There are a handful of LEED certified homes along the Oregon and Washington coasts.

Energy Star (www.energystar.gov) is a US government program to guide homeowners towards energy saving and healthy homes. They offer a number of paths towards attaining a certified green home.

Living Building Challenge (www.ilbi.org) was launched by the Cascadia Chapter of the US Green Building Council in 2008 and now resides with the International Living Building Institute. Their goal is to certify the greenest of green homes; those that are on the path towards being fully sustainable homes.

Financial Incentives for Energy Efficiency and Renewable Energy

Oregon Department of Energy (www.oregon.gov/energy) manages energy tax credits for energy efficiency and renewable energy.

Washington Department of Commerce (www.commerce.wa.gov) manages energy tax credits for energy efficiency and renewable energy.

Energy Star (www.energystar.gov) is a source of information about federal tax credits for energy efficiency and renewable energy.

Energy Trust of Oregon (www.energytrust.org) provides financial incentives for residential energy efficient improvements and pre-qualified renewable energy systems for Oregon residents within the service territories of Portland General Electric, Pacific Power, Northwest Natural, and Cascade Natural Gas (Astoria to Cannon Beach, Lincoln City to Newport, and Coos Bay)

Information on Green Homes

One of the best books on green homes is *Green from the Ground Up* by David Johnson and Scott Gibson. This well illustrated book came out in 2008 and provides guidance for homeowners, architects, and building professionals.

The US Green Building Council (USGBC) and American Society of Interior Designers (ASID) partnered to create an online resource guide for residential remodeling. Their free guide, "Regreen Guidelines" can be downloaded from www.regreeen.org.

The US Green Building Council maintains a good web site, www.greenhomeguide.com, with a variety of current articles for consumers and design professionals.

Environmental Building News (www.buildinggreen.com) is an excellent source of reliable information on green building products and systems. Visitors to their site can access a number of well-written product reviews. Members have the benefit of a robust search engine to download the full history of magazine articles.

The Green Building Advisor web site at www.greenbuildingadvisor.com was launched in 2009 and is already one of the go-to sites for those interested in learning about green homes. The site has a great collection of case studies, including a number on the West Coast.