

## What's Hot: Creative architecture teams energy sources for tomorrow's home

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With energy prices continuing to climb, home builders are looking for ways to offer affordable environmentally friendly homes.

One developer, Solaris Communities, finds itself on the cutting edge of energy efficiency. By combining solar-powered systems and computer controls with architectural design, the company plans a community of 25 homes in Port St. Lucie and is building two models in Jupiter.

The Solaris concept was born when Tom Pirelli, an engineer now living in Chicago and developer of Solaris Communities, wanted to move into an energy-efficient home in Florida.

"I was thinking about the future of my two teenage daughters," he said. "I knew that unless we made changes, the world will be a very different place by the time they are in the prime of their lives.

"The Sunshine State was behind in harnessing solar power. Since I couldn't buy what I wanted, I decided to recruit a team to design an energy-efficient and environmentally friendly home.

"It has taken eight years of research and development," Pirelli said. "Now the technology has matured to the point where we can incorporate solar power and computerized environmental controls into affordable residences."

Dick Sheehan, president of Sheehan Realty Corp. and a partner in Solaris Communities, said the time is right for the concept: "Energy will not get any cheaper, and as the population grows, builders will be forced to look at alternative sources. We hope to play a major role in transforming the housing industry - from building for traditional energy sources to building for renewable ones."

Creative architecture, too, is a major component, said Mitch Kunik of Boca Raton-based Affiniti Architects. "We'll be using some traditional techniques to capture cooling airflow that were popular in the days before central air conditioning became standard.

"These will be combined with innovative designs that are specifically tailored to the high-tech components of the Solaris house. Yet the home will not have a high-tech appearance. It will have a neo-traditional, Caribbean-style look," Kunik added.

These energy-efficient homes begin with an innovative wall-construction method. Steel-reinforced polystyrene sections are built in a manufacturing plant, then trucked to the building site. The sections are erected and filled with a single pour of concrete.

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"This technique creates a monolithic wall structure. Moisture can't get in to cause mold or mildew, and termites and other pests are locked out," said Buddy Cribb of Cribb Construction.

The exterior walls are finished with stucco. "Then we use a high-grade, environmentally friendly paint that forms a kind of breathable 'skin' to create an additional moisture barrier," Cribb added.

The solid concrete walls are also very strong. "That's a definite plus in storm-prone Florida," according to Cribb.

These homes will have a roof made from recycled metal. Banks of solar panels integrated into the roof design will produce a significant percentage of the electricity used by the house, and large batteries in the garage will provide backup in case of utility power outages or brownouts.

"The whole house could run on the batteries for two days," Pirelli said. "And as soon as the sun comes out, the solar panels will recharge them."

To minimize the overall need for energy, an environmental-control computer will continuously monitor virtually every function in the house. Motorized, sun-reflecting shades, for example, will lower automatically to reduce solar heat entering through windows.

"The computer tracks the sun's path and automatically adjusts the shades so that the sun's rays do not heat up the tile floor or the walls." Pirelli said.

Compact fluorescent and light-emitting diode (LED) lights are used instead of incandescent bulbs to reduce the need for electricity and to reduce the heat load on the air-conditioning system.

Further savings result from motion detectors and computer-controlled timers that automatically turn off lights.

"The computer also adjusts the inside temperature, allowing it to rise to 82 degrees Fahrenheit when the homeowner leaves the house," Pirelli added. "Then it begins the cooling process again an hour before he or she returns."

Natural-gas appliances further minimize electricity needs, while a circulation pump, activated by motion detectors in each bathroom and the kitchen, produces instant hot water.

"This is very convenient and provides significant savings, because you don't have to run the tap needlessly to get hot water," Pirelli said. "A solar water heater on the roof will take care of much of a typical home's hot-water needs."

The home also addresses the issue of safety. "There are no keys. Instead, all locks are electronic, and the computer system monitors door access. A Web camera offers extra security. Owners can view their homes over the Internet and control all house functions from anywhere in the world," Pirelli said.

In addition to technology, Solaris homes incorporate traditional architectural features of bygone days that maximize energy efficiency.

"In the past, architects designed homes with breezeways and other features to capture natural cross-ventilation and provide shade and protection from rain, Kunik said.

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"But when air-conditioning became standard - and energy was cheap - homes became completely enclosed. Today, windows sometimes don't even open. Our homes will revisit designs that help to cool naturally."

Sonia Lise Longchamp and Richard Carle, both of Robb & Stucky Interiors in Boca Raton, are doing the interior design for the Solaris home.

"We're working within the home's strict environmental parameters," Longchamp said. "For example, anything that we would normally build into the outside walls or ceilings using traditional design would penetrate the energy-efficient barrier of the home."

The designers plan to search out environmentally friendly paints, carpets, fabrics, flooring and other materials for the interior. "We'll use as many natural products as possible," Longchamp said.

The current emphasis on environmental concerns is evoking more interest in "green" building and design, Carle noted: "The timing is perfect for this project. We feel like we're helping to generate momentum for a new way of building homes."

Homeowners will enjoy energy efficiency that will save money in utility bills, as well as a greater degree of storm protection.

"But it's more than that," Cribb said. "People who purchase such a home can feel good about it and about themselves. They're doing the right thing for our world today, and for generations to come."

"If enough people do the right thing, we can make a significant difference."

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