Two Vermont residential projects are models of green building techniques and technology

BY SALLY WEST JOHNSON

The most welcome trend in the construction trade is "green building," a catchall phrase that covers everything from siting the home to choosing the siding. Green building attempts to reduce the impact of construction on the environment—to build or renovate in a sustainable manner that respects the land, requires fewer resources, and uses energy efficiently. Two recent homes, both in Chittenden County, offer case studies of green-building philosophy, technique, and technology.

The loft in the meadow

This red house is green—but you can't tell by looking at it. From the outside, the 1,700-square-foot home, which sits in a field in a rural part of Chittenden County, resembles a Vermont barn, red siding and all. The interior has the minimalist chic of a Manhattan loft, with lots of wood, stone, and stainless steel.

To the uninitiated, nothing about the house screams "green," and that, says builder Dunbar Oehmig, is the beauty of the thing. "Not all green houses are 'earthy' in design," adds his colleague, Chris Quinn. Oehmig and Quinn are among eleven partners in the employee-owned company of Red House, Incorporated.

Not so long ago, the term "green building" brought to mind an oddball home that put technology ahead of comfort and aesthetics. As public perception has changed, so, too, has the interest in green building, which is now one of the hottest trends in the housing market. Quinn says "an increasing amount of people building homes in Vermont are willing to sacrifice space for design, detail and energy efficiency," a trend that's being played out across the country.

The problem with quantifying this statement is that "green" means many different things to many different people. To the layperson, it usually implies the use of unconventional heating and cooling technologies. To practitioners, it means a great deal more than that.

Still, there are common denominators in green building, first and foremost being the notion that less is more. Quinn outlines the top three strategies for increasing the "green" of a house: "Shrink it, shrink it, shrink it again." Nothing, he says, is as important as "the question of net resource consumption. The fewer resources you use, the greener the building."

In the Red House "rural loft," the

From the outside, this 1,700-square-foot "green" house in Chittenden County looks like a Vermont barn. Built by Red House, the home provides a cutting-edge example of affordable, energy-efficient building techniques and technology.

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builders used materials often associated with commercial buildings—and these materials created many of the home's distinctive features and cost-saving measures. Simple form and clean lines define the exterior, which is made of industrial-painted steel siding and laminated-wood trim. These green-building products reduce cost and maintenance.

In the case of this project—the owner asked not to be identified—the interior space is wide open, with an absolute minimum of walls. The collaborative design process between the owner, builder, and the Winooski-based architecture firm of Gardner Kilcoyne, created the loft-inspired environment, including a garage door made of glass

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The interior has the minimalist chic of a Manhattan loft; radiant heat runs through the polished concrete-slab floor.

set into the western face of the house. The door can be left open in warm weather; in cold weather, it admits enormous amounts of light. "It creates an indoor-outdoor living space," says Oehmig, "and gives the room a lofty, airy feeling." It also ensures that the small house will not feel small. It is a concept borrowed from commercial storefronts.

The finished concrete-slab floor reduces redundancy in the building process and enables highly efficient use of radiant heating. The efficiency of piping warm water through the floor means that the water need be no hotter than 115 degrees, allowing for the use of a high-efficiency, condensing boiler to heat the polished concrete slab. The house also was tested for air exchanges (in other words, drafts) and found to be exceptionally tight. The exterior walls and the roof are filled with recycled cellulose insulation, and the walls are then wrapped with foam to stop heat from being transferred. To keep the interior air healthy, indoor and outdoor air is exchanged through a ventilator that conditions the incoming air to mitigate heat loss. The combination of those technologies won the house a "Five Stars Plus" rating from the Ver-

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One key to green building? Less is more. So shrink it, shrink it, and shrink it again.

mont Energy Investment Corporation, one of only a few dozen homes in the state to earn that rating. Little of this, of course, is visible to the naked eye.

But the elements that are visible to the eye—the elements that give the house its very urban flavor—are the high-end aesthetic pleasures of the blue glass tiles in the bathroom that sparkle in the sunlight, or the Baltic birch kitchen cabinets that create a visual warmth in the cool room. One of the most prominent features is the steel stairway in the center, painted an eye-catching red, with maple treads and stainless-steel cable rail. The use of stainless steel is carried throughout the interior, including the eight-foot kitchen island with integrated sink.

The bottom line? This house was built to fit the owner's tastes and lifestyle; it also happens to be moderately priced and resource-efficient. As a very big bonus, the owner also will live in a home that is 50 percent more energy efficient than a conventional home, and one that will require little or no maintenance for many years to come.

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Green lifestyle and location

When Chuck Reiss speaks "green," he'll definitely cover radiant heat and super-efficient boilers. By definition, those topics are part of the discussion—but Reiss is talking about something far more conceptual than heat pumps. He's talking about a state of mind.

Reiss' development company, Vermont Building Resources, currently is building six green homes on a south-facing slope just south of Hinesburg. Three of the houses are nearly complete, two lots are sold, and one is still on the market. The project is called South Farm Homes, and it was

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Here comes the sun

Innovations in technology and residential incentive programs—including a Vermont rebate, a state sales-tax exemption, and a federal tax credit—have made solar energy an affordable option for many Vermont homeowners in recent years. After these savings, the net cost of a roof-mounted solar system, like the one seen above, is roughly $25,000, including installation. This turnkey system in Weybridge includes solar electric panels that generate about 170 kilowatt hours of energy per month, or 25 percent of the electricity used in the average Vermont household each month. (Larger systems can offset up to 80 percent of electric use.) Two larger thermal panels, in front, generate 70 percent of the hot water needed for domestic use. "We work with customers to assess power demand, budget, and roof space," says Jon Budreski of Solar Works, the Montpelier company that installed this system. "Buying a solar system is a one-time cost that will provide 'free' electricity for years. Over time, the savings are significant."

—Kathleen James

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designed by Truex Cullins & Partners.

In planning the project, Reiss' first consideration was location, location, location. The site is close enough to the village that children can walk to school, and parents can walk to the grocery story. A path will lead into town, so walkers needn't face Route 116. That same path will give Hinesburg residents access to a network of walking trails to be cut on the neighboring conservation land. To Reiss, that's what green is all about. "People think green is just energy," he says. "But we think it's green when people don't have to get into their cars to do their daily chores."

Reiss is working under guidelines established through a program called Vermont Builds Greener, which was created by a statewide nonprofit, Building for Social Responsibility. According to VBG literature, "The focus of the program is to promote the construction of homes that are healthy, durable and have reduced impact on the immediate environment and the global resources that support our built environment."

The first of six VBR homes

Using a scorecard approach, VBG awards points for project elements, one being proximity to a town or village center. Another criterion is size: A house larger than a certain number of square feet will be hard pressed to qualify, no matter how many energy efficiencies have been built in, while a small house can earn extra points.

Reiss' goal is to make South Farm Homes a net-zero energy site, and he's well on his way. The houses are heated with pumps that draw heat from well water and pipe it through the concrete flooring at a steady 100 degrees. The south face of each standing-seam metal roof is overlaid with a four-kilowatt array solar panel, which goes a long

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way toward meeting the energy needs of the homes. He hopes to finish his quest for an energy-neutral site with a 100-foot-tall tower and wind turbine that will fill the gap between what's produced and what's needed.

The houses at South Farm conform to the more standard definition of green as well. They are all between 1,600 and 1,900 square feet, compared to the average size of a new home in the United States, which was 2,300 square feet in 2007, according to the most recent home-builder surveys. (By way of contrast, the average new home in Great Britain this year was 1,000 square feet.) The siding is made of a cement-wood composite, which should last longer than wood siding.

The builders are using a double-wall construction technique. The air space between the walls provides a thermal break, which means there is no direct contact between the interior and exterior through which heat could be lost. All of the hardwoods have been purchased from the Lathrop Mill in Bristol, which has started a certification program guaranteeing that the hardwood has been harvested in an ecologically correct fashion.

One of the unusual aspects of South Farm Homes is that Reiss and his company bought the 25-acre site in conjunction with the Russell Family Farm, a longtime farming family from Hinesburg. The houses will take up 10 acres of the site; the Russells will farm the other 15 acres. It's the sort of consideration that Reiss hopes all builders someday bring to bear on their projects. "Green means much more than energy," says Reiss. "It means rethinking our lifestyle." □

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