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The Green Design Guide

Our annual Green Home of the Year award winners show how sophisticated design concepts and energy-saving technologies combine to create residential masterpieces.



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Old + New03

Best Use of Advanced Building Technologies

23



DESIGN TIP:

Take time to choose the best possible site for the green objectives; take into account the natural features and southern exposure critical for photovoltaics and hot water.

DESIGN TIP:

Pay attention to the building envelope first; a structure that is as airtight as possible helps all the add-on systems run more efficiently.

DESIGN TIP:

Don't neglect the green potential of the landscape for supporting a native and natural approach to beautifying the exterior.

With its holistic approach to sustainable design, this custom home showcases dozens of green ideas.

The Adirondack-style shingled home, complete with a pond and running stream, holds its own along the estate-studded back roads of New Canaan, Conn. But it is a beauty that's simply the veneer on a highly engineered and efficient home.

"The couple's goals were to build the greenest, most energy efficient house possible," says architect Jim Edgcomb. "This site had attributes they were looking for: natural water features and open areas for photovoltaics, along with beautiful views."

The homeowners also had a long list of materials and systems that they wanted to include in the program.

"An indispensable part of our process is making the box as airtight as possible," says Chris Trolle, the project's engineer. The super-insulating process was extensive. Crews insulated the precast concrete walls with 1" of rigid foam board followed by spray foam. The floor slab sits on a 6" bed of crushed stone and 2" of foam board. Above-grade walls are 2x6, 24" OC. Roofing was framed with 2x12, also 24" OC.

Contractors filled the void left by 2x3 strapping in the basement and other parts of the house with spray foam insulation, further increasing R-values (R-58 roof, R-31 above grade, R-39 basement).

Most windows are triple-glazed casements with two layers of low-E coatings and two 1/2" air spaces filled with argon; frames are solid wood and aluminum clad so that they are virtually maintenance free.

Because the clients wanted the visual aesthetic of stained-shingle cladding, they selected FSC-certified cedar from local sources. To increase the durability of this material, the builders installed a special mesh fabric between the building wrap

- > **Project Name:** New Canaan Residence, Conn.
- > **Builder:** Chris and Mike Trolle, BPC Green Builders
- > **Architect:** Jim Edgcomb
- > **Landscape Architect:** Didona Associates Landscape Architects
- > **Landscape Professional:** Plantscapes Organics
- > **Poolscaper:** J & J Pool & Concrete Service
- > **Photovoltaic and Solar Panel Installer:** Alteris Renewables
- > **HVAC Contractor:** B&D Controlled Air Corp.



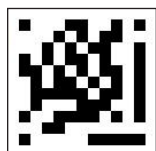
ENERGY-SAVING LIGHTING
Pendants in the kitchen include CFL lamps, and undercounter lighting uses LEDs.

RECYCLED TILE
Glass tile used in the backsplash is from Trikeenan Tileworks.

RECYCLED TOPS
Where a granite look was desired, the owners selected Icestone, which includes recycled glass.

CERTIFIED CABINETS
All cabinets are finished with low-VOC coatings and built with FSC-certified lumber.

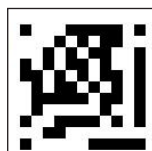
RECLAIMED WOOD
Red and white oak floors throughout the home were milled and reclaimed from old timbers.



FROLING P4 PELLET BOILER

Wood pellets made from compressed sawdust are the resource and cost-efficient fuel for this automatic feed heat source. A larger hopper was custom-designed to feed into the smaller hopper that is attached to the boiler.

www.woodboilers.com



ECOSTAR MAJESTIC SLATE SHINGLES

Made of 80% post-industrial recycled rubber and plastic, these shingles are 50-year rated, and come in a variety of colors. www.ecostar.carlisle.com



and shingles, allowing moisture to drain out and away.

For the roof sheathing, the clients chose a shingle manufactured from recycled rubber. The shingles, which even close-up look like slate, met the client's expectations for sustainability; cost-wise, the roof is comparable in price and durability to a standing-seam metal product.

"Our focus is always on the building envelope, first," says Edgcomb. "Once you have a durable, high-performance envelope, you can add the systems."

To provide about 94% of the home's electricity, a 10.8 kW system, consisting of 1,000 square feet of pole-mounted PV panels, was installed in the optimum location on the nearly five-acre property. But it is the hot water system, which supplies radiant floor heating,

domestic hot water, and heated pool water in the warm weather months, that uses the most ingenious integration of three high-efficiency sources.

Solar thermal panels on the roof (500 square feet) heat a custom-made 1,000-gallon water tank, which is used like a battery to store heat for all the home's requirements. When the sun isn't producing enough heat, a pellet boiler with automatic feed backs up the solar panels. In the event that these systems cannot keep up with demand, a super high efficiency (AFUE 95) propane boiler will kick in.

Wherever possible, the clients wanted local and sustainable materials used throughout the interior and exterior. Stone for building facings and landscape stonework was harvested on or near the property;



The site was carefully planned and landscaped to minimize water use and take advantage of rainwater harvesting.



reclaimed lumber and FSC-certified wood products from Northeast sources were also used for the structure and finish items such as the kitchen island and desk tops. Countertops made from recycled glass at a Brooklyn, N.Y., fabricator were yet another local selection.

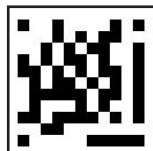
“They were incredible clients,” acknowledges Edgcomb, and the builder agrees. “They were completely committed to doing the right thing.”

In fact, not only did these clients push through a graywater system—the first domestic system approved by the state—they also had a composting toilet installed in the master bath, linked to a composter in the basement.

The landscape design complements the home’s resource-conserving features. Rainwater runoff from the roof is captured in underground cisterns and used for irrigation.

The efficient heating system in the home, combined with an automatic pool cover makes the swimming pool indulgence more sustainable.

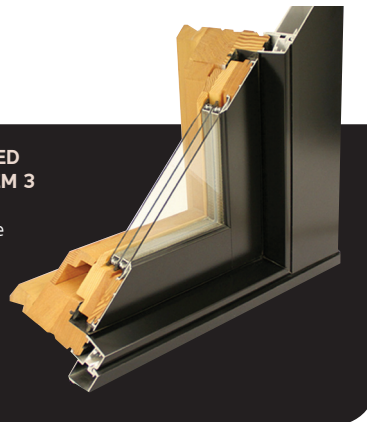
The resulting home and property is a living green laboratory—it has earned LEED Platinum and NGBS Emerald status—that the clients enjoy sharing with school and university groups, other building professionals, green advocacy groups, and their neighbors.



LOEWEN TRIPLE-INSULATED HEAT SMART PLUS SYSTEM 3 WINDOWS

Manufactured in Canada, these wood windows are rated U-.21 and R-5. This project featured aluminum-clad windows with factory applied and finished aluminum casings .

www.loewen.com



PRODUCT HIGHLIGHTS

> For a complete product list of this project, scan the bar code below. Or go to www.greenbuildermag.com and click on the Green Products tab.

