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07.26.2010

Sun Shines on NY's Super-Sustainable Passive House

Barn-raising for Dennis Wedlick Architect's Hudson Passive Project, among the first in New York State



FIVE GLU-LAM TRUSSES FRAME THE HUDSON PASSIVE HOUSE, DESIGNED TO USE 90 PERCENT LESS HEATING ENERGY THAN A TYPICAL THREE-BEDROOM HOUSE
JOHN ISAACS

To get through the downturn, architect Dennis Wedlick has spent a lot of time thinking about caves. Not to hide in for the duration, but because a cave provides a helpful metaphor for explaining the perfect passive green residence: One continuous material provides super insulation, with only one energy-leaking opening. Translating that basic formula into a package more appealing than a cave has been Wedlick's goal for over two years. Finally on June 26, as part of a modern-day barn raising, some 150 people congregated in Claverack, New York to hoist the five glu-lam trusses that frame the Wedlick-designed, three-bedroom Hudson Passive House in a south-facing meadow. Developed with research support from New York State Energy Research and Development Authority and the Levy Partnership, with land provided by Sciamé Development and construction funded by Bill Stratton Building Company, it is on track to be among the first certified passive houses in New York State.

"There are only about ten certified passive projects in the entire country," Wedlick said, "but something like 10,000 in Germany. That really tells you how far behind we are on sustainability." A residential architect with a streak of missionary zeal and offices in both Manhattan and Hudson, New York, Wedlick started transforming a prefab model that he was working on with Sciamé into a market-rate green home using existing prefab construction technology.

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THE HOUSE IS SET ON A SOUTH-FACING MEADOW IN CLAVERACK, NEW YORK, AND CALIBRATED TO THE SOIL TYPE, WIND VELOCITIES, AND SOLAR MICROCLIMATE OF ITS SITE

COURTESY DWA

The Hudson Passive House is designed to use 90 percent less heating energy than a typical three-bedroom house. "It'll have a small footprint, enclose a fair amount of space, and still be architecturally exciting," said Frank Sciame, the founder of Sciame Construction, who diverted 65 acres from a 300-acre development into a laboratory for exploring sustainable housing development.

Passive green is achieved more through design than advanced technologies or apparatuses. Insulation as efficient as a coffee thermos is key, and here it's accomplished with sandwich-insulated panel walls and roof, plus a concrete floor slab poured on top of high-density rigid insulation. Those moves improved the insulation for the walls and roof by 50 percent, and for the floor by 600 percent.

With the largest double-height window facing south, and the north window positioned high for venting, all the windows are triple-paned and coated with thermal break film. A heat recovery ventilator keeps air fresh, whether cool or warm. Many of the more detailed design decisions make common sense—keeping wiring, plumbing, and duct runs short to prevent heat leaks. Other design elements contribute not only to better insulation but also to a rural aesthetic that makes the house tuck charmingly into its setting: local fieldstone veneer walls, deep overhangs, and a cathedral ceiling within to maximize solar gain in winter. Photovoltaics, wind turbines, and even thermal heating were not used since the house already employs so little electricity. "We achieved such a dramatic reduction in energy use from the way we built," Wedlick said. "That would just be icing on the cake."



ENERGY SAVINGS ARE ENHANCED BY THE USE OF TRIPLE-PANED WINDOWS COATED WITH THERMAL BREAK FILM, ALONG WITH A CATHEDRAL CEILING TO MAXIMIZE SOLAR GAIN IN WINTER

COURTESY DWA

The house is in fact so responsive to its environment that when moved from a site in Sullivan County to Columbia County—where the soil type, wind velocities, and solar microclimate and cloud cover were all slightly different—the team had to recalibrate all aspects of the insulation, from wall thickness and glass expanse to depth of the overhangs. In fact, fulfilling the international performance standards to achieve certification by the Passivhaus Institute, the Darmstadt, Germany-based authority on passive sustainability,

is a bit of a puzzle that was only complete, Wedlick said, when window treatment manufacturer Hunter Douglas “came up with insulator blinds that helped us turn the last corner to get the edge on performance.”

Wedlick’s project joins several other passive houses in the region that aim to be certified by the Passivhaus Institute, including the [R-House](#) in Syracuse, designed by ARO in collaboration with Della Valle Bernheimer; a Brooklyn brownstone designed by Prospect Architecture; and two projects under way by Loading Dock 5 in Brooklyn.

Following the frame-out in late June, the Hudson Passive House, [for sale](#) from Bill Stratton Building Company on spec for \$500,000 to \$700,000, is due for completion by Labor Day. But for Wedlick, the house has already succeeded. “There’s no need to build 100,000 houses, if we can just get 100 going,” Wedlick said. “Identifying a tribe that’s able and willing is the beginning to making a huge difference.”

Julie V. Iovine