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Hudson Valley Home Fall 2011: First Green, Passive House in New York State Constructed in Claverack (Columbia County), NY

An architect committed to sustainable living designs an extremely green home that almost heats itself

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By virtue of its forward-thinking design and construction, New York State's first passive house — located in Columbia County — practically heats itself

Photographs by Peter Aaron/Esto

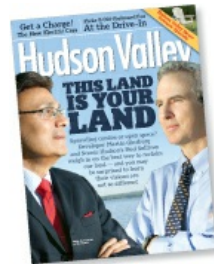
(page 1 of 2)

On a sunny day in June, about 40 people gathered under a canvas canopy on the lawn of a newly built, barn-like spec house in Claverack, Columbia County. The architect, Dennis Wedlick, and the builder, Bill Stratton, were celebrating the completion of the house along with their teams. A few journalists were there, too, because this was no ordinary spec house. Rather, it's a passive house — one of the most energy efficient houses in the world, the eleventh to be certified in the U.S., and

the first in New York State. Nick Ford, Stratton's site supervisor, said a few words about how building it was "a mind-changing experience," for the construction crew. "This is the future," he added.

A passive house is a virtually airtight dwelling that consumes about one-tenth of the energy required to heat and cool a conventional house. To be certified, it must meet the exacting standards established by the Passivhaus-Institut in Germany. This one actually exceeds those standards — and its efficiency is due almost entirely to its design and construction. It does not rely on green technologies like solar, wind, or geothermal power.

Dennis Wedlick, who launched the project, has been "green" since his college days at the tail end of the Carter administration. Back then, engineers at MIT and similar institutions were exploring not only alternative energy sources, but the idea of buildings that consume considerably less energy in the first place. In this country, that research "went dormant in the late '70s," says Wedlick. "Then we all kind of went in the closet, because clients didn't want to hear about energy conservation." But after he established his own



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firm in Manhattan in 1992, Wedlick, a longtime member of the Green Building Council, remained dedicated to the concept.

He also kept an eye on work being done at the Passivhaus-Institut in Germany. (There are already some 25,000 passive buildings in Europe.) Three years ago, Wedlick decided to design a prototype passive house that would be aesthetically appealing and quick to construct. He called it the Hudson Passive Project, and enlisted the support of the New York State Energy Research Development Authority (NYSERDA), who kicked in some grant money to pay for engineering. Bill Stratton, whose construction company is based in Old Chatham, had worked on earlier projects with Wedlick, and took on the construction challenge.

Designing the three-bedroom, two-bath house took about two years, as Wedlick tweaked the specifications. “We went round and round to get the highest quality materials, both for aesthetic and architectural purposes,” Wedlick says. “We kept changing window patterns. We kept testing the design’s performance using software developed by the Passivhaus Institut that tells you how much energy you’ll use per year. You feed in the data, the dimensions of the rooms, the windows, the connections. It calculates your climate, the number of sunny days, cold days. It even calculates how people live, and spits out an answer. You’re building the house in cyberspace.”

After it was constructed in cyberspace to Wedlick’s satisfaction, the real construction began on seven Columbia County acres. Building ran along traditional lines as far as the timber framing and stonework went. Then “it was trial by fire,” says Stratton, referring to installing the especially thick structural insulation panels, and the meticulous finishing and detail work. “We had a guy come who’d installed this type of SIP panels, and spent an hour hearing his dos and don’ts. And the guys on the crew did a lot of research themselves.”

“To represent what the building is all about — living passively with nature — I wanted to have a huge glass wall, so I started with a buttressed arch like in a cathedral,” says architect Wedlick of the barn-like home

The finished house is essentially one box inside another, with about 12 inches of foam insulation in between. It has a minimum number of joints, and nothing that can conduct heat — a nail, for example — can touch both the inside and outside skin. “Think of a thermos,” Wedlick explains. “It passively keeps liquids cool or warm for a very long time. The more successful the passive system, the longer the interior can maintain its temperature, without added heat or cooling, regardless of what it’s doing outside.”

A simple electric unit called a mini-split heat pump provides hot or cool air, and is required for only a few minutes a day. Otherwise, heat comes from the sun and the people living in the house. “We were doing some finish work there in January,” Stratton recalls, “and we had some nights that were four and five degrees. We weren’t running the heat. We’d get there in the morning and it was 56, 60 degrees inside — it retained heat from the low sun in winter, and the heat we generated. If you were running around in your skivvies you’d want it a little warmer than that, but then you just turn on the heat for a few minutes.” A state-of-the-art heat recovery ventilation system keeps air circulating, bringing in fresh air and expelling stale air without losing heat. (In clement weather, you can simply open the windows.)



Soaring ceilings framed in bow-arch beams (“the shape of a Dutch barn,” notes Wedlick) make the compact home seem more expansive, as does the huge wall of triple-paned windows. Organic materials used for the interior include Douglas fir cabinetry, southern yellow pine for the beams and paneling, a stained concrete floor and glass tiles. The small, rectangular unit in the center of the wall in the loft is the mini-split unit that supplies cooling and heating



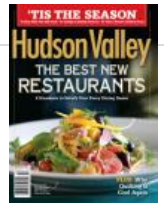
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POSTED BY SUE

OCT 13, 2011 05:31 PM

According to this article, two bathrooms are located behind the kitchen to make use of only one water "tank." This begs the question of why, in this energy-saving home, did you not design it with an on-demand (propane?) unit? An additional small unit upstairs would mean that occupants there wouldn't have to go down a flight to use the bathroom! Though with only 3 bedrooms & two baths, I'd suspect an additional tankless heater wouldn't be necessary. It can't be efficient, in comparison, to heat a tank full of water all the time for the few times a day at the sink or laundry when hot water is needed.

POSTED BY HPP625

OCT 27, 2011 04:24 PM

Thank you so much for noticing that. The domestic hot water is actually supplied with a Stiebel Eltron Electric Tankless Water Heater. We chose to have both bathrooms on the first floor, behind the kitchen because our goal was to be as efficient as possible. If the bathroom was on the second floor, the hot water would have to travel another 6-8ft. However, it is not impossible to achieve the passive house standard if you have bathrooms on separate floors. In the end, it is an aesthetic choice of the end user. We are doing another passive house and designed the bathrooms on two floors. Hope this helps!

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