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Passive House, Aggressive Idea

BY VICKI DISTEFANO

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What if you could create an energy efficient, sustainable home without solar panels or wind energy? What if the solution towards energy efficiency and sustainable design were just about the architecture and not the technology? The Hudson Passive House Project has made this idea a reality. The house uses no geothermal power, no wind power, yet it uses 10 percent the energy of a normal house, simply by the way it's built.

The Hudson Passive House, located in Claverack in Columbia County, was built in four months. Situated on seven acres of land, the three-bedroom, two-bath house is the eleventh building in the country to be approved by Passive House Institute US (PHIUS), and the first to be approved in New York state. The house is 1,650 square feet and was designed by [Dennis Wedlick Architect, LLC](#). Research and development was funded by Dennis Wedlick Architect, LLC with the help of a grant by [New York State Energy Research and Development Authority](#); it was constructed by [Bill Stratton Building Company](#), and engineered with [Levy Partnership](#) (Structural Engineering with Engineering Ventures, Mechanical Engineering with [CDH Energy](#)).

Extremely space efficient, the Hudson Passive House exemplifies a return to conservative construction techniques developed centuries ago. A building trend that started in Germany, a passive house is also called Passivhaus. According to PHIUS, it's called passive because a "passive" house achieves overall energy savings of 90 percent of space heating without applying expensive active technologies like photovoltaics or solar thermal hot water systems. The architecture allows energy losses to be minimized, and gains are maximized. The super-insulation and air-tight construction minimize energy and heat losses. The home maintains comfortable temperatures regardless of the season. It works to retain or trap heat from entering to lower heating and cooling costs.

Wedlick compared the design of the house to a thermal coffee cup. Because the floor, walls, and roof are insulated to an extreme degree, the house is air tight, allowing no exchange of hot or cool air from the outdoors. This allows for complete air circulation throughout the space, but not from the outdoors in. For ventilation and climate control, a heat recovery ventilation (HRV) system is used. A HRV basically works using a counter-current heat exchange between the inbound and outbound air flow. In other words, the HRV helps the air to stay constantly moving while also providing fresh air and improved climate control, and helping to save energy by reducing the heating (or cooling) requirements. HRV also helps keep energy that has already been generated inside the house instead of venting it out.

To become a certified passive house, the house must pass an "air blower" test. The air blower test tests the amount of air that is exchanged from the inside to the outside. The Hudson Passive House passed with a rate of .16 air exchanges per hour, making it one of the most efficient passive buildings in the country.

Designed to conserve as much energy, heating, cooling, and water as possible, the kitchen and two bathrooms are adjoining in order to utilize a minimum of piping and energy.

"All of the appliances and fixtures are bundled together to save energy," Anna Klein, DWA associate, explained. "All the bathroom fixtures are on one wall, and the kitchen fixtures are clustered together to save the maximum amount of energy."

The design of the house is a departure from traditional green architecture. The three-bedroom house has the appearance of an old country home, inspired by the historical structures in the region. The entry way of the house has accents of beautiful wood, especially in the arched ceiling. The double-paned window, built by [Serious Windows](#), allows the light to brighten the space. The open style of the house is emphasized with an open closet behind the master

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bedroom and two three-walled bedrooms on the top floor.

The simplicity of the design allows for the architecture to speak volumes. The sustainability was interpreted through the interior design of the house. "We wanted green, but not stale," interior designer Elaine Santos said. She achieved this by using recycled glass tiles, low-VOC paints, and purchasing from local vendors to reduce carbon footprint. Santos said she wished to achieve a look that was low-maintenance, practical, and suitable for a homeowner looking for a "creative, unique living scenario."

Although the appliances help keep energy use down, they are not a significant portion of why the house is so efficient. Yet, vent-less dryers help to keep the house airtight, as well as the vented stove hood above the induction stove.

The Hudson Passive House is not a blueprint for all passive houses. The loft style of the house, high arched ceilings, large double-paned windows, and open spaces are not what makes it passive, the architect explains. "The design of the house doesn't have to be standard, it just must be well built," said Wedlick.

The house is currently listed at \$599,000 by Gabel Real Estate.

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