

Chicago winter without a furnace or gas bill: Passive houses make it possible and are slowly catching on

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In the 1970s, long before the Prius and Green New Deal, a small group of engineers and architects at the University of Illinois at Urbana-

Champaign was already going green.

As the U.S. government encouraged energy conservation during the oil crisis, the Small Homes Council applied the approach to [home building](#).

The passive [house](#) was born (although it was dubbed "low calorie" at the time).

Canada allegedly holds claim to the first true passive house, then Europe took the idea mainstream before it eventually returned to the U.S. via the Urbana, Ill., Smith House in 2003.

"In a way it's come full circle," said Mike Knezovich, communications director at the Passive House Institute U.S. (PHIUS), based in Chicago. The organization's co-founder, Katrin Klingenberg, was the brains behind the Urbana prototype.

The idea is simple: airtight construction that leads to energy conservation and, in the ideal scenario, no carbon footprint. This is accomplished with extra insulation, highly efficient windows and an "energy recovery ventilator," which continuously pushes stale air out and brings fresh air in. The end result is a comfortable home with good air quality and far lower utility bills than a traditional build.

But even as the construction industry and homebuyers put more emphasis on eco-friendly building practices—and owners can vouch for the benefits—true passive houses are still relatively rare and have been slow to catch on.

"It's so unsexy," Tom Bassett-Dilley joked about the science behind building passive, noting it doesn't have the same flare as, say, solar power. The Oak Park-based architect, whose firm focuses on sustainable building, completed Chicagoland's first certified passive home in 2012

in River Forest.

To achieve PHIUS certification, a house must meet certain design criteria and energy targets—standards are updated every few years—and pass a variety of assurance/quality control tests administered by a third party. Illinois boasts 19 certified passive houses with an additional 10 under review.

"People always associate [energy conservation](#) with sacrifice, I think going back to Jimmy Carter wearing an extra sweater," Knezovich said. "But people that live in them love them."

Mary Chris Jaklevic and her husband, Roy Schuster, worked with Bassett-Dilley to build their Oak Park home in 2010. The couple didn't opt for official certification, but the home was built using passive methodology and functions as such, including the fact that it has no furnace. Heat comes from lighting, the sun, household appliances, cooking and even the residents' bodies. The house isn't even connected to a gas line, a common practice in passive building.

"I think that's one of the big factors that we underestimated was just how comfortable it would be to live in this house. It's a lot quieter because the walls are so thick and the windows are triple-paned," Jaklevic said. She also noted the high air quality and lack of drafts.

Chicago architect Mark Miller, who recently completed his first true passive build in Gull Lake, Mich., said one of the first questions people ask is whether they should worry about fresh air—are they going to suffocate? On the contrary, he said, because of the specialized ventilation system, the air quality is great, and people with allergies or asthma may even notice improvement in their symptoms.

Miller notes energy reduction as another obvious benefit, saying the

savings can be upward of 85%. Or if the house were a car, he said, it would get 200 miles per gallon.

And modern efficiencies don't have to mean modern design.

"Because of this misperception that it's a really European thing, there's also a sense that a passive house has to look ... really contemporary and austere," Knezovich said. "That's not true at all, they can look really traditional and pretty much fit into any neighborhood."

Both Knezovich and Miller point to a 2011 American foursquare-style home in Bethesda, Md., that helped bust the myth that passive homes can't look traditional—or even historic.

Bassett-Dilley is retrofitting a Frank Lloyd Wright home in Oak Park, with the hope it will be net-zero upon completion—a term often used incorrectly interchangeably with passive. Net-zero homes produce as much energy as they consume, meaning a net-zero energy bill and a carbon-free home. Many of the same building principles apply.

Passive certification isn't feasible for all renovations, including Bassett-Dilley's Frank Lloyd Wright project.

"It's an incredibly fascinating and challenging project because we have to be very careful about making sure what we do is reversible," he said.

"We won't be tearing off historic material or retiring art glass for the sake of some more insulation." He will, however, rely heavily on solar power as the home's energy source.

Bassett-Dilley said Frank Lloyd Wright's style, solar panels and passive houses have one major thing in common: design with nature in mind. How passive houses are constructed varies greatly by climate. A single-family stucco home in hot, dry Phoenix has different needs (and

certification requirements) than a brick three-flat in Chicago.

No matter the style, Miller believes many more existing homes should be converted to passive than currently are.

"We have so much housing stock that is performing so poorly, so there is a great opportunity to retrofit our housing stock," he said. And buyers are interested—whether or not they know it.

"Very few people understand or even know or ask for a passive house," said Stephen Chertok, a real estate agent with @properties. But they are asking more about the "essential characteristics" of a passive house, he said. Jaklevic and Schuster were in that camp, wanting an energy-efficient home but not yet familiar with the term "passive house" back in 2010.

Chertok thinks cost is a major barrier—builders without passive experience will often come in with high-priced project bids because the labor and materials aren't as familiar. But for architects and builders knowledgeable about the process, the cost is comparable, according to Knezovich. "People wonder if they can afford passive. The answer is yes," he said.

He and Bassett-Dilley agree that additional up-front cost for things like highly efficient windows and insulation (think 5% to 10% reflected in mortgage payments) is made up for in utility bill savings. Currently, passive certification doesn't grant homeowners a premium on their assessment, but various rebate, grant and loan programs exist in Illinois.

Compared with the building industry at large, the state's passive community is relatively small but mighty. Those at the forefront work hard to spread the mission, including Jaklevic, who claims the title "#passivehouse enthusiast" in her Twitter bio.

"Every time I see a new house going up, I look at the walls and how thin they are, and the windows and how they're not particularly well insulated," she said. "I think, 'Wow that's a lost opportunity.' "

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