



Guests tour the area's first passive home built by Lucien Ellison and designed by Architect Kevin Pfirman in Wilmington on Thursday. Photo By Mike Spencer

'Passive' home meets top energy-efficiency goals

By Wayne Faulkner

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The striking 5,700-square-foot house sits on the water amid huge live oaks off Greenville Loop Road.

Its mid-century modern style sets it apart from its more traditional neighbors, but what makes it truly unique isn't readily apparent to the casual observer.

The home of builder Lucien Ellison of Ellison Building Co. is the only "passive" house in the Wilmington area. In fact there are only four in North Carolina, Ellison said as he spoke Thursday afternoon to a tour sponsored by the Cape Fear Green Building Alliance.

A passive house is an energy-efficiency standard, the most rigorous in the world, Ellison explained before the tour began. It doesn't just apply to residences. Brussels, Belgium, for instance, will require all new buildings to meet passive house-like standards by January.

"If you build it right you're

going to get energy savings of 60 to 70 percent over a code-built house," said Ellison, who built his own home.

Among characteristics of a passive house are super insulation. The local house is heated and cooled by a heat pump, but it's a two-ton system, the size that would be used for a 1,500-square-foot house, not one more than 5,000 square feet, said Skye Dunning, building performance manager for the home.

Ellison said his last monthly power bill was \$200, but he expects it to fall.

It amounts to about \$2,100 a year, but heating is only \$71 a year and cooling, \$315, Dunning said, explaining that a lot of usage is plug loads and lighting.

Another characteristic – thermal bridge-free construction – was one of the toughest standards to meet, said Kevin Pfirman, the house's architect.

Everything is contained within a thermal envelope, so "all the beams stop at the

wall; they don't go outside," he explained.

The whole house is made of a concrete system that was prefabricated in a factory in Durham, Pfirman said. "That method of construction made for a complete thermal bridge-free wall," he said.

Among other criteria for a passive house are high-performance windows and doors, energy-recovery ventilation, and optimal solar orientation.

The house is built to take advantage of the sun in the winter and to be shaded in summer, Ellison said.

Siting the house was no easy task, Pfirman and Ellison said. Top of mind was to preserve the property's mature oaks.

"There was a constant shifting of the house," Pfirman said. "If we turn the house three degrees to get away from the sun, we are going to hit the roots of the trees. Siting was the most difficult challenge."

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