

Netting zero energy

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By **SULLY WITTE**



Photo by: [Sully Witte](#)

East Cooper Habitat For Humanity recipient Tiffany Smith received the keys to her new family home. Her children Isaiah Flood, Leilani Mulligan, and Jeremiah Flood, were very excited to volunteer alongside their mother and other volunteers who constructed the home.

Tiffany Smith is East Cooper Habitat For Humanity's 63rd homeowner. She celebrated this month when she closed on her new home on Kent Street.

Surrounded by family, friends and Habitat volunteers, Smith was all smiles as East Cooper Habitat representatives showered her with gifts and praise.

As an employee of East Cooper Medical Center, she is used to helping others. On this day, she was given a second chance to make a fresh start.

But this house wasn't the typical home built by East Cooper Habitat.

The home was designed to use energy it creates itself.

The Building Enclosure Council of Charleston and the East Cooper Breakfast Rotary Club teamed up with the East Cooper Habitat for Humanity to construct what is called a Net-Zero Energy House (NZEH).

This NZEH project explored energy-efficient construction methods and net-zero energy strategies and tackled the challenge of Charleston's notoriously hot-humid climate.

Utilizing strategies such as Structural Insulated Panel (SIPS) walls and roofs, air-tight construction, geothermal HVAC, energy recovery ventilation and high performance windows, the house will serve as a new model of efficiency for future Habitat projects. It will also serve as a model to the construction professionals and volunteers who learned through hands-on engagement during its construction.

Two years ago East Cooper Breakfast Rotary Club (ECBR) president Wayne Cassaday had a vision.

He saw that area Rotary Clubs could join together to build a Habitat for Humanity house, thinking it would be a good way to build camaraderie among the various clubs and within the individual clubs. Charles Muldrow, a Rotarian in the ECBR Club and a local architect, has been involved for some time with the Charleston Building Enclosure Council (BEC | Charleston), a joint initiative of the American Institute of Architects (AIA) and the National Institute of Building Science (NIBS) - which has a primary objective of providing educational opportunities

to architects, contractors, manufacturers and building officials towards means of improving the performance of the building envelope.

BEC | Charleston had been exploring the idea of building a Net Zero Energy House and using the construction process as a vehicle for education, with a particular emphasis on how to achieve net zero energy consumption in a hot-humid environment such as Charleston.

They approached the East Cooper Habitat for Humanity with the idea, which president Bob Hervey enthusiastically endorsed.

"The real story here is that a Net Zero House will generate enough energy to power the home plus sell power back to the utility," Muldrow said.

"The initial cost is higher because of the technologies used, but as they become more prevalent, those costs will hopefully come down," Muldrow explained.

The project, with anticipated technologies such as geothermal heating and cooling, solar water heating and photovoltaics, is estimated to exceed \$100,000.

The house

The house design was modified from a design used by Jeff Christian at Oak Ridge National Laboratory (ORNL). Rotarian Paul Curry helped with the structural design work. Rotarian Warren Pruitt assisted with site design. Dennis Knight of Liollo Architects and a member of BEC | Charleston assisted with the mechanical design to study how the humid outdoor air will be treated.

Pella Windows donated its (most energy efficient) windows, while a reflective roof has been donated by (IMETCO), and SIPS (which is a Structural Insulated Panel) from Global Solutions are being donated at a reduced rate. ECHFH has built LEED Certified homes before but this house is the first of its kind focused on energy.

South Carolina Electric and Gas recently launched a program to allow for a Net Zero system and have in place specific guidelines for those who want to tap in using a specified inverter to safely put power back through the lines.

Volunteers from the building industry worked alongside Rotarians and other volunteers.

Construction took about seven months to complete, which is only one month longer than the construction process on a traditional Habitat home.

The home features two bedrooms and two bathrooms and totals 1,200 sq. feet. Smith's responsibilities will be passive.

The utility bills will be monitored for research purposes.

Muldrow was not only instrumental in the construction aspect of the home but he brought in extensive donations to make this construction possible.

Rotarians, various churches and Habitat volunteers worked alongside Smith and her children to construct the home.

Muldrow said the process was eye-opening and he knows that the concept of energy efficiency can be carried forward in all Habitat homes.

Smith said she was blessed to have been chosen and felt a new level of humbleness and thankfulness while the building process was carried out.

ECHFH Construction manager Kate Whitlock oversaw each construction detail.

She was proud of the end result and said, "We make it a house. She makes it a home."

([Sully Witte](mailto:editor@moultrienews.com) can be reached by e-mailing editor@moultrienews.com. Visit www.moultrienews.com).