

Award-Winning Coverage of Sustainable Construction, Products and Lifestyles

GREEN BUILDER[®]

01.2016 / www.greenbuildermedia.com

ENERGY SOLUTIONS

Imagine a future of renewable power and intelligently designed living. In this, our annual awards issue, we honor the nation's very best green homes and explore the innovative edge of housing.



Model of Efficiency.
The InVision Zero SC model home is based on Addison Homes' popular Emerson plan.



CASE STUDY 2: Mainstream Model

Solar shingles and an attractive rebate program are making net-zero homes from Addison Homes appeal to buyers in this South Carolina market.

ADDISON HOMES IS committed to making *zero energy* a mainstream option, modeling a vision of sustainable construction that's attractive, affordable and attainable for homeowners. Its 2,700-square-foot InVision Zero SC is not only the first zero-energy home in Greenville, S.C., it is also the first area's first Active House.

Active House is an international alliance of manufacturers, designers and nonprofits started in Denmark around 2007. The international Active House Alliance emphasizes comfort, environment and energy. The standard gives importance to optimal natural daylighting (including interior rooms), as well as indoor air quality and resource efficiency.

Builder Todd Usher says the light, bright interiors are key to the appeal of the InVision Zero house, which was built as a model home in the company's Trailside development. A dozen VELUX skylights and windows, including VELUX tubular *SUN TUNNEL* skylights, flood the home with natural light without increasing energy use. There is little need to turn interior lights on during the day.

Usher says, "While there's always been a niche for extreme efficiency, we envision broadening this market by building attainable, sustainable homes designed to expand the power of *zero*," says Usher. "An Active House [also] fosters wellness." Benefits of a healthy home include increased concentration and learning, improved sleep quality, reduced allergy symptoms and lowered risk of poor health. To achieve indoor air quality, the home features a Lennox *PureAir* purification system and no- and low-VOC paints and finishes.

The house also meets relevant International Code Council (ICC) codes, something that helps appraisers rate its green value here in the U.S.

Without solar power, Usher says, the InVision Zero home's HERS *continued on page 19*

INVISION ZERO SC SOLAR STRATEGY

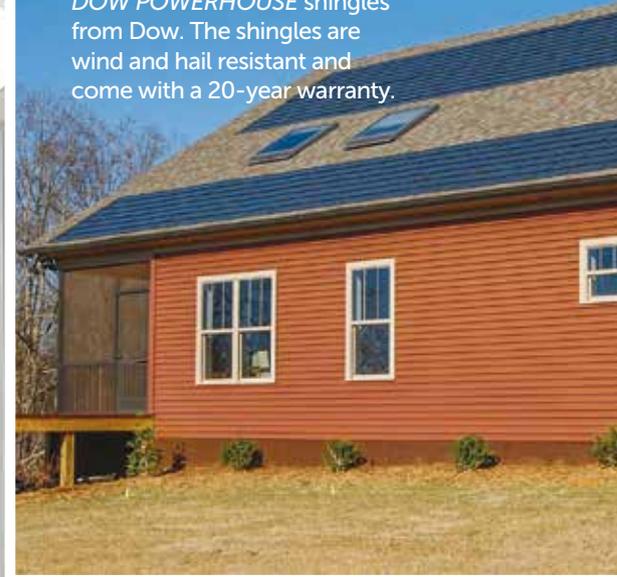
www.addison-homes.com

Sunny Rooms

VELUX venting skylights, roof windows and sun tunnels bring natural light and fresh air into the home. This daylighting not only benefits occupants' health and well-being, it reduces the need for artificial lighting during the day.

Solar Shingles

An 8.2-kW array consists of DOW POWERHOUSE shingles from Dow. The shingles are wind and hail resistant and come with a 20-year warranty.



Efficient Heating and Appliances

A Lennox XP25 heat pump (up to 23.5 SEER) and a Navien tankless gas water heater minimize heating loads. An Energy Star-rated laundry pair from Electrolux are among the home's efficient appliances.



score would be in the 40s. With the 8.2-kW *DOW POWERHOUSE* solar shingle PV system, its HERS score is 0.

Solar energy has been given a boost in South Carolina. Local utility Duke Energy recently adopted net metering and began offering a “dollar a watt” one-time rebate on PV systems. This followed adoption of legislation passed at the end of 2014. Solar installation costs around \$4 per watt, and a system on an energy-efficient, high-performance home generally ranges from 5-8 kilowatts. That means average rebates of between \$5,000 to \$8,000 for homeowners, which reduces the cost some 25 percent.

Usher says InVision Zero will sell for \$380,000, but federal and local rebates will bring the price down to \$350,000.

Addison Homes is building 16 homes in Trailside to the standards of the DOE Zero Energy Ready Home program, but since committing to solar its zero-energy model home, several clients with houses underway in the neighborhood have opted to go with solar as well.

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Breakthroughs in Storage

DEMAND FOR RESILIENCE is driving several companies to create grid-compatible storage solutions. Silicon Valley-based JuiceBox Energy is one of them. Last April, the company announced the release of an 8.6-kWh lithium-ion storage system. A *JuiceBox* consists of an array of lithium-ion batteries and intelligent battery management system housed in a UL-rated enclosure. It integrates with the Schneider *XW+* inverter. The controller manages the inverter/charger interface and includes redundant protection mechanisms to prevent over voltage and other unsafe conditions. The system is designed to support grid-tied, grid-isolated and off-grid configurations; it can be installed in new and existing solar PV arrays. The controller constantly monitors the battery, PV output and building loads and “chooses” a mode of operation based on factors such as utility rates; for example, it can reduce peak consumption by switching to stored energy once the sun goes down, and during a grid outage, it can power the home’s critical loads.

Recently, JuiceBox Energy partnered with Rising Sun Solar to install its first residential energy storage system in Hawaii, on the island of Maui, and in December, a *JuiceBox* was integrated into a 3.7-kW residential PV array in San Diego. WWW.JUICEBOXSOLAR.COM



JuiceBox Specs. A 8.6-kWh lithium-ion battery pack with proprietary charge control and energy management system is coupled to the Schneider Conext *XW+* inverter, which is now listed and approved for use in Hawaii.

CREDIT: JUICEBOX ENERGY