



Appalachian State University

Team (re)Connect

RESILIENT HOUSE



Project Summary

Resilient House was born through a union of the ASU 2016 Advanced Building Science graduate course and the senior design studio to create the newest edition to a local builder's Net-Zero-Energy line. Deltec Homes, a prefabricated home builder headquartered out of Asheville, NC, recently launched the Renew Collection of net-zero homes. A single family residence that is not only sustainable and zero-energy ready, but also resilient in the face of increasingly harsh weather due to climate change aligns with the vision of the Renew Collection. Deltec's long history of coastal construction spans numerous hurricanes; since 1968, they have "never lost a home to high winds of any kind." Appalachian State's history with Deltec dates back to their collaboration when designing ASU's award-winning Solar Decathlon 2011 entry – The Solar Homestead. Deltec has included that design in their Renew Collection, and the intent for this design is to follow in those footsteps. The Resilient House is a Zero Energy Ready Home (ZERH) that is resilient to a changing climate and a target market of move-up millennial families.



Relevance of Project to the Goals of the Competition

The Resilient House meets the DOE Zero Energy Ready Home criteria, as well as falls within the criteria of Deltec Homes' Renew Collection requirement of being a net-zero home. This fact paired its aesthetically pleasing and resilient design is what prepares the Resilient House for any housing market.

Design Strategy and Key Points

The Resilient House meets ENERGY STAR standards, DOE Zero Energy Ready Home National Program Requirements, EPA Indoor Air Quality Plus, Water Sense Standards, IBHS FORTIFIED Hurricane Standard Gold Designation, and has a HERS score of 40 without photovoltaics.

Project Data

- Location: North Topsail Island, NC
- 2012 IECC Climate Zone: 3
- Square Feet: 2,140
- Number of Stories: 2
- Number of Bedrooms: 3
- Number of Bathrooms: 3
- HERS Score: 40 w/o PV

Technical Specifications

- Estimated Monthly Energy Cost: \$80 w/o PV
- Floor Insulation: R-44
- Wall Insulation: R-30
- Roof Insulation: R-60
- Heating/cooling: 22 SEER
- DHW: 3.39 EF
- ERV: 40-140 cfm w/ 72% SRE