



# APPALACHIAN STATE UNIVERSITY

## MOUNTAIN LAUREL HOME



### Project Summary

Our design process started with an exciting partnership with Dan Ryan Homes, a national production homebuilder with regional headquarters in Raleigh. We wanted to design a single family residence that would not only be sustainable and zero-ready, but livable and marketable as well. Our goal was to find a balance between these three directions.



### Relevance of Project to the Goals of the Competition

We want to inspire a progressive direction in production built homes. Using integrated design techniques we were able to unite students across disciplines and enhance the academic environment of Appalachian State University. Starting with currently marketable residential designs we were able to create a starting point that would merit feasibility in readiness of design for production residential application.

### Design Strategy and Key Points

The Mountain Laurel House exceeds LEED Platinum certification by 7 ½ points, meets ENERGYSTAR v.3, DOE Zero Energy Ready Home National Program Requirements, EPA Indoor Air Quality Plus, and Water Sense standards, Passive House Standards, and has a HERS score of 41 before Photovoltaics are added. Advanced framing techniques along with an efficient layout reduced material requirements while increasing our mechanical systems' efficiencies. The Mountain Laurel design creates flexible and adaptable spaces within the home that grow and develop with its owner. The home is adaptable to many different climate zones without modification, and to more northern zones (6 and 7) with relatively minor changes in the HVAC system.

### Project Data

- Mebane, North Carolina
- Climate Zone: 4
- 2,278 ft<sup>2</sup>
- 5 Bedrooms, 2 ½ Bathrooms, 1 ½ Stories
- HERS Scores: 41 (Before PV), -3 (After PV)
- \$83/Month

### Technical Specifications

- Wall Insulation – Blown Cellulose, R-Value = 26.1 with R-10 exterior foam = R-37
- Foundation – Concrete Slab on Grade, R-Value = 15 perimeter
- Roof Insulation - Blown Cellulose, R-Value = 50/ Cathedral Ceiling – Blown Cellulose with 2" spray foam = 52.3
- Window Performance = U-Factor = 0.027, SHGC = 0.20
- HVAC specifications = Air Sourced Heat Pump, 16.0 SEER, 10 HSPF