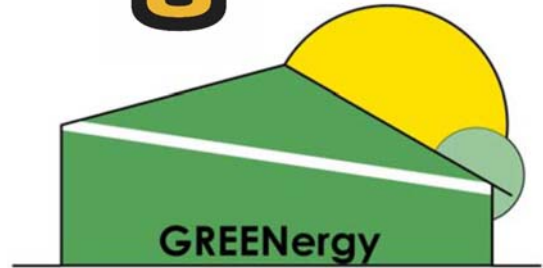




Team GREENergy Zanos II House



University of Missouri
Suburban Single-Family

Project Summary

Team GREENergy collaborated with Central Missouri Community Action to create a house design that will be suitable for low-income residents in the Columbia area. To achieve our goals of sustainability and affordability, we have designed a home through the integration of mechanical systems, passive energy design strategies, and architectural design strategies that promote a comfortable living environment and achieve zero-net energy.



Relevance of Project to the Goals of the Competition

The Zanos II House meets the DOE zero Energy Ready Home Requirements while maintaining a balance with affordability for homeowners who traditionally have not been able to have a high-performance home. The home uses appropriate and advanced building science strategies combined with maximum energy efficiency, high performing building materials and construction methods, and high-efficiency mechanical and electrical systems. Universal design strategies for the home enhance the variety of possible occupants of all ages and abilities. The design of Zanos II connects with the style and context of the neighborhood, natural environment, and larger community.

Design Strategy and Key Points

The size of the Zanos II House lot provides room for a narrow house plan with the longest side of the home facing south. The house is centered on a main longitudinal axis that provides optimum circulation. The vaulted ceilings and universal design layout offer a maximization of the space making the home seem larger than it appears. In combination with the long floor plan, properly shaded windows, and optimum solar orientation, the Zanos II House primarily uses passive heating and cooling for comfort, with supplemental mechanical systems. The house employs a thermal mass for heat retention during the cold months and clerestory windows to maximize the amount of natural light. The clerestory windows also assist with natural ventilation, which reduces the cooling load. The design also incorporates an advanced thermal envelope. The building systems and assemblies are designed to meet the specifications for a resilient home: energy-efficient, healthy indoor air, and resistant to natural disasters (fire, flood, drought, tornadoes).

Project Data

- Location: Columbia, MO
- IECC Climate Zone: 4A
- Square Footage: 1392 SF
- Size: 1 Story, 2 Bed, 1.5 Bath
- HERS Rating: 32 w/o PV; -6 w/PV
- Estimated Monthly Energy Costs: \$54.83 w/o PV; <\$0 w/ PV

Technical Specifications

- Structure: SIPs
- Wall Insulation = R40
- Foundation Insulation = R15
- Roof Insulation = R50
- Window Performance = 0.15 U-Value; 0.18 SHGC
- HVAC Specifications: 1.5 ton heat pump SEER 20 min.