UT Zero is a multidisciplinary team with the goal to develop new technologies for zero energy building for the University of Tennessee and the state of Tennessee. Our desire is to promote zero net energy consumption and zero carbon emission technology. Our mission is to bring students and faculty from various programs together to collaborate on UT Zero Energy projects.

**OUR VISION**

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In the design of future residential and commercial architecture, energy efficiency (along with social, cultural, demographic and economic issues) has to be considered as a more and more decisive factor. Threatening climate changes and the recognition that our fossil energy sources are finite has caused global calls to lower CO₂-emissions. They are the starting point for a rethinking on several levels. The sun and the energy it emits thereby play a central role. Especially in the energy supply of buildings, solar power can be used in many ways. With our Research focus on developing the UT Zero Energy House we want to showcase these opportunities and ways of using solar power and other technologies.
UT Zero Energy House

Performance Architecture:
Beyond Efficiency and Optimization

1. Digital Architecture Architecture & Design
   Performance Based / Sustainable Design
   Evolutionary Optimization
   Digital Architecture and Environmental Studies

2. Building Materials Materials Science and Engineering / OPNL
   New Building Materials and New Technology of Construction
   Phase Change Materials (PCM)
   Coatings & Colorants, Aerogel / Vacuum Isolation, etc.

3. Performance Environment MAB Engineering
   Alternative Heating and Cooling Strategies
   Energy recovery
   Energy management

4. Building Control and Diagnostics Electrical Eng & Computer Sci
   Digital Simulation and Data Processing (UT Supercomputer)
   Performance Analyses
   Sensors, computing, information processing

5. Structures Civil & Environmental Engineering
   Structural analysis and optimization
   Intelligent / responsive Structures
   Non-Standard Structural Design

6. Sustainable Building Design ISSE with CASNR / Landscape Program
   Green Power applications: Hydrogen Fuel, Photovoltaic’s
   Biotechniques / Bioengineering
   Sustainable Products

Solar Decathlon 2011

The Solar Decathlon is a competition in which universities compete to design, build, and operate the most attractive, effective, and energy-efficient solar-powered house. The Solar Decathlon is also a public event demonstrating the powerful combination of solar energy, energy efficiency, and the best in home design. The first large project for the UT Zero Energy House is to enter into the Department of Energy’s 2011 Solar Decathlon Competition. The backbone of this competition will be how well we communicate between the various departments involved and make an efficient product to complete the tasks assigned.

Prototype 01

UT Zero Energy House Prototype 01 with Energy Plus Facades, Translucent Solar Cells embedded in Windows. This project advances new construction techniques and solar energy development as a multidisciplinary team project. Our summer course will finish the Prototype as a piece to use, test and display as an engineered student collaboration.