University of Illinois at Urbana-Champaign

Gable House

Program Area:
Energy Program

Grant Amount:
$200,000

County:
Champaign

Location:
Champaign, IL 61820

Grantee:
University of Illinois at Urbana-Champaign

Grant Date:
November 2008

The U.S Department of Energy hosts a biennial Solar Decathlon competition, which challenges collegiate teams to build sustainable, affordable, and attractive housing that is entirely powered by solar energy. The extensive competition requires the house to produce at least as much energy as it consumes, sustain all normal household activities, and maintain comfortable living conditions while remaining cost-effective. Designing and building these homes takes nearly two years and immense effort from each college. Teams must transport the home to the host city and rebuild it on-site in a very limited time frame. The Solar Decathlon has international outreach and provides incredible hands-on learning experiences in sustainable design and construction for college students across the world. The Foundation has supported several Solar Decathlon entries over the years including the University of Illinois 2009 entry that won 2nd place overall.

The 2009 entry from the University of Illinois was named “The Gable House” and resembles a 100 year old barn, similar to what is common in rural Illinois. The Gable House was built to reflect traditional Illinois agricultural architecture blended with modern day technology. The house is framed with bamboo and the façade was created from reclaimed barn wood. The house was built to Passive House standards and achieved PHIUS certification. In order to meet Passive House standards, the house has to be extremely energy efficient, with minimal thermal bridging, and able to be heated by the power of a single hair dryer. The heating and cooling needs of the 517 square foot house were 90% lower than a similar house built to conventional code and resulted in an Energy Use Intensity of only 4.75 kBTU/sf/year. It was determined that it would cost only $1.39 per month to maintain comfortable living conditions. The Gable House is so well insulated that during the competition the body heat from the constant flow of visitors was enough to keep the house warm without supplemental heating, even with the cool October conditions in Washington D.C. The roof was designed to support south facing solar panels and for ease of construction. The roof includes a 9.1 kW photovoltaic (PV) system, which supplies four times more energy than the house requires. The Gable House was awarded 2nd place overall out of 20 teams in the 2009 competition and is located on the edge of the University of Illinois Research Park where tours of the house take place throughout the year.