A Place in the Sun

Talent and hard work helped Team UNLV earn their top-in-the-nation ranking in the Solar Decathlon 2013. But research is the next priority for several team members after the award-winning home is relocated to the Las Vegas Springs Preserve.

UNLV was the top-ranked team in the nation and won second place overall for its “DesertSol” home in the U.S. Department of Energy Solar Decathlon 2013 competition, which requires student team members to design, build, and maintain a sustainable solar-powered house. Sixty students from multiple disciplines, including architecture, engineering, and business, designed and built DesertSol, which will be on display soon as the newest public exhibit at the Las Vegas Springs Preserve.

While the design and construction of the home were impressive feats in and of themselves, some equally impressive research on the house and its features has been conducted behind the scenes. For the competition scoring, data were collected on the house’s comfort zone temperature and humidity, appliance temperature, and net energy production. Several team members are using this data, and collecting and analyzing more of it, for various research projects. According to UNLV graduate student Jinger Zeng, the Solar Decathlon 2013 project engineer, several graduate students are writing their master’s theses on aspects of the project. One wrote her thesis on the solar thermal system, which provides domestic hot water for the home and heats the house itself using a hydronic radiant system. The home also features an advanced automation and control scheme, which will be examined in further engineering research on residential energy use reduction. Zeng herself is writing her thesis on the overall design and operation strategies of a net-zero energy home built for the Mojave Desert environment.

Plans are in place for students to make a scholarly presentation at the American Council for Energy Efficiency Economy 2014 Summer Study on Energy Efficiency in Buildings. Students also plan to write scholarly articles with their faculty mentors on the project.

Lead faculty advisor and architecture professor Eric Weber is pleased that students on the team are taking an active role in research, and he himself is pursuing several scholarly projects with them. He has had a paper accepted for presentation at the Eighth International Conference on Design Principles and Practices and is working on two posters for the Associated Collegiate Schools of Architecture Spring Conference. Also, he is submitting a research findings paper to the Building Technology Educator’s Society and hopes to present a paper to the Fifth North American Materials Education Symposium. He also plans to submit more articles to respected academic journals in the future.

Meanwhile, manufacturers of materials and systems used in the home have contacted the team to gather input on the performance of their products. Far left: An artistic pattern of holes creates the image of a mesquite tree on this metal screen, considered a passive energy-saving feature.

During the competition, DesertSol actually produced more energy than it consumed and tied for first place in the hot water generation category of the competition.