

Research team developing model for sustainable desert living

July 19 2013, by Lynne Oconnor

Team ASUNM, a collaborative effort between Arizona State University and the University of New Mexico, has come together to address the inefficiencies of urban sprawl and to create a model for sustainable desert living that has been dubbed SHADE, or Solar Home Adapting for Desert Equilibrium, an entry in the Solar Decathlon 2013 competition that takes place October 3–13, in Irvine, Calif.

ASU and UNM are located in [desert areas](#) of the American Southwest that experience extremely high temperatures while serving as a home to millions of residents, with more arriving every year. Phoenix and Albuquerque have become an urban sprawl of asphalt and resource-intensive homes. Occupants often come from areas that are more lush, bringing with them landscaping choices that incorporate non-indigenous plants and require copious amounts of water, which has contributed to drying river beds and depleted reservoirs.

Inspired by the saguaro cactus because of its adaptation to the desert and its ability to survive with minimal resources, Team ASUNM wanted to create a home that could adapt in size and function and adjust to extreme swings in diurnal and seasonal temperatures. The design of SHADE is focused on affordable photovoltaic solutions in partnership with engineers from Quantum Energy and Sustainable Solar Technologies Research Center who are assisting with the monitoring and evaluation of how effective alternative systems can be in the extreme [desert](#) environment.

Using external vertical screens and a solar canopy for shade, the SHADE home experiences a stable, consistent temperature with the use of a radiant cooling system used alongside an air cooling unit. Team ASUNM is exploring the residential application of [thermal storage](#) to chill water at night to create ice that cools a glycol solution during the day.

Plants used in landscaping SHADE are native to the Sonoran and Chihuahuan deserts and includes a butterfly and hummingbird garden. Irrigation will incorporate a gravity-fed hose that draws water from a rainwater collection system.

A video tour of the SHADE home describes details of the design and construction, including the use of adaptive spaces, staggered studs, humidity buffering, hydronic micro capillary tube system for radiant cooling.

Provided by University of New Mexico

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