

## How cool is technology?

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### New homes will put it to the test

By Valerie Lemke

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The San Diego County hamlet of Borrego Springs, with average summer temperatures routinely in the triple digits, is the site for construction of four energy-efficient demonstration homes – the first of their kind in a desert area.

The goal: to demonstrate that energy used for cooling can be reduced by up to 90 percent, according to Nicole Gittleson, vice president of marketing for Clarum Homes, a Palo Alto-based home builder.

Since 2003 the company has built 275 zero energy homes – a designation from the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) – in California and an additional 175 are planned.

Using one floor plan, the 2,000-square-foot, three-bedroom, three-bath homes in Borrego Springs will have several energy-efficient features in common, and a couple of different cooling options.

Following completion of construction and prior to occupancy, a 30-day testing period will evaluate the energy efficiency of each home for NREL.

For one year after completion, tests will continue to determine which combination of walls and cooling systems provides the most reduction of cooling costs. In addition to the same floor plan, each home boasts such energy-saving features as photovoltaic solar systems on the roof and five-foot shade overhangs around the perimeter.

Colored concrete floors with built-in radiant cooling and heating, tankless on-demand water heaters, and sustainable building materials such as engineered lumber and fiberglass windows and doors are included in each. In addition, "Low-E" energy-efficient windows, water-conserving plumbing and shade screens on windows and doors are standard in all of the residences.

The houses differ in wall and cooling systems. Two feature walls comprised of Styrofoam sandwiched between exterior and interior walls of concrete designed for energy efficiency through uninterrupted insulation and moisture resistance. Developed by Dow Chemical Co., the Styrofoam T-MASS panels are delivered assembled and can be erected in a day.

The two other cutting-edge wall systems – structural insulated panels and high-efficiency engineered wood framing – are combined with extra levels of insulation.

The energy efficiency of three differing cooling systems also will be tested during the first year. Speakman two-stage evaporative coolers are featured in two of the homes. One residence combines a Freus water-cooled condenser and an air conditioner. The third will be cooled with a Lennox 20.S air conditioner.

The project is being built in partnership with the U.S. Department of Energy's Building America Program;

ConSol, a Stockton-based energy consultant; the Davis Energy Group in Davis; and Dow Chemical's building and construction division. Architect for the project is Michael Frerking of Living Sustainable Architecture & Construction in Prescott, Ariz.

Completion of construction is slated for late September this year, and sale price of the homes – located on sites throughout the valley – will be about \$450,000.

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