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EXCLUSIVE REPORTS

$2 million solar home takes 'green' living to next level

Mike Padgett
The Business Journal

Bryan Beaulieu figures that in about a year, he and his family can move into one of the rarest houses in the Southwest. He calls it an "earth-sheltered, hydrogen-powered, solar home."

From his 5-acre lot on the southwest slope of Troon Mountain in North Scottsdale, Beaulieu has a view of the Valley that, on clear days, reaches to the West Valley horizon. He's hoping his new home's cutting-edge technology will offer a view into the future of alternative residential energy options.

Beaulieu has the backing of the city of Scottsdale's "green building" program, which encourages owners, architects and contractors to use environmentally friendly construction methods.

"This is a world-class project," said Anthony Floyd, director of the green building program. "There is not another one in the state, maybe in the country."

Beaulieu said the next few weeks are going to be busy. Construction of his "hydrogen house" is about to start, and he has accepted an offer to begin teaching at Taliesin West this fall. Beaulieu is former president of Skyline Displays, a Minneapolis-based manufacturer of custom modular trade show exhibits. He founded the company in 1980 and resigned last year.

A graduate of University of Minnesota's Institute of Technology, Beaulieu is an engineer with 25 patents in pollution control and structural systems. He and his wife, Yvette, and two sons moved to the Valley about four years ago.

Beaulieu's architect is Valley resident Bob Bacon, the principle at R.J. Bacon Architectural Design, noted for his one-of-a-kind luxury homes as well as The Boulders Resort and the Cochise/Geronimo Golf Clubhouse at Desert Mountain. Beaulieu's contractor is The Construction Zone.

The home is called "the hydrogen house" because solar panels designed to function as the structure's eaves will provide electrical energy needed to convert water into oxygen and hydrogen.

For aesthetics, the panels will resemble stained-glass skylights. The hydrogen, stored in carbon-fiber tanks, will be the energy source for the house's gas-powered range, fireplace and water heater -- and even the family's hydrogen-powered cars.

For electricity, the hydrogen gas will power a generator that keeps a battery bank charged. And because hydrogen produces clean emissions, the generator's exhaust "is much cleaner than the air that went into the air intake in the carburetor," Beaulieu said.

The house's design has more solar panels than needed, so extra electrical energy will be fed into the Arizona Public Service Co. power grid.

Beaulieu hopes to start construction this month. The estimated cost is $2 million.

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<tr><td>Front view</td><td>Above from the mountain</td></tr>
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<tr><td>Front view</td><td>Lot from above</td></tr>
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"If it does work and if people think that living this way makes sense, we may market this on a long-term basis, instead of putting up all the Styrofoam and chicken wire that we're doing now," Beaulieu said.

He was referring to the dominant construction method prevalent in all types of residential construction in the Valley, from entry-level houses to luxury mansions.

Beaulieu's basic design has five hexagonal living units, or pods, connected by paths. Each pod will have about 1,000 square feet, and the garage is under one of the units.

The roofs and support columns of the living areas will be concrete poured in place. The roofs will be covered with soil, in which cactus and other native plants will be planted. Those plants and others in planters surrounding the house will be irrigated with "gray water" from the house's showers.

Cooling for the interior living spaces will be provided by water circulated in plastic tubes dropped 200 feet down 8-inch holes drilled into the mountain. After the tubing is looped down into the hole, the hole will be filled with sand and kept wet. The underground tubing will carry water into other tubing buried in the structure's concrete ceilings and floors for radiant-energy cooling.

The temperature of the mountain's interior, at a depth of 10 feet, is about 70 degrees. Below that, the temperature "is in the 60-degree range, constant temperature," Beaulieu said.

"There will not be any refrigeration allowed in our structure," he said.

Beaulieu credits Valley resident Roy McAlister of the American Hydrogen Association, based in Mesa, for the idea to create a hydrogen-fueled house. During Arizona's recent gas shortage, McAlister didn't pay higher prices at the pump because he was driving his hydrogen-powered pickup or car.

"He's the one trying to get the Valley to see that we don't have to buy oil from Texas and that we could be making our own energy here," Beaulieu said.

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Scottsdale Green Building Program: 480-312-4202.