Smart energy efficient homes

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At first glance, it looks like an ordinary home with a neat yard. Inside there is a wooden dining table and chairs, a taupe sectional sofa, a 65-inch built-in flat screen TV in one living room wall and a white kitchen with silver appliances. But the house, on the University of California campus in Davis, is a cradle of technology that foretells the future of home design.

The house is equipped with an energy management system Honda created to monitor and manage its energy production and consumption. Though it"s connected to the electrical grid, the abode produces more energy than it uses throughout the year, making it a "zero net" home. California requires all new homes to be zero net energy starting in 2020. Honda posts the home"s architectural and technical designs online, says Michael Koenig, who leads the smart home project.

"This house is smarter than me," says Stu Bennett with a chuckle. He fiddles with an iPad app that allows him to control the lighting, the entertainment system, the charging of an electric car in the garage and the opening and closing of the window shades. He can also check the solar energy production, the charged level of the battery pack and room temperatures on the tablet. "You can even pipe music into your garage. This is the ultimate remote control," he says.

Bennett, his wife Susan O"Hara and their twin 9-year-old daughters moved into the home in October. O"Hara is the executive director of UC Davis" School of Education while Bennett is an actuary for California"s public employee health and retirement plan system, CalPERS, in Sacramento. Bennett"s need to commute 17 miles each way to work was one of the reasons that Honda picked the family to be the first occupants. The carmaker wants to collect data about charging and driving electric cars and provides Bennett with a blue, all-electric Fit.

The couple was renting a much larger home nearby when they applied to live in the smart home, intrigued by the chance to experience its technology. "We knew this was a once-in-a-lifetime opportunity," Bennett says.

For its first set of occupants, Honda advertised its desire to host a family from the university community that has no pets, can move in quickly and is interested in sustainable living. The family also had to be open to doing interviews and receiving visitors from the media and public. The visitors have ranged from Governor Brown to two students who were intrigued by the house and rang the doorbell at 11 o"clock one night.

The company also looked for a commuter in the family who would need to drive about 30 miles per day, because it wanted a driver for the electric Fit and charging equipment it would provide. O"Hara and Bennett moved in less than two months after they applied.

Koenig"s interest in sustainable home design is personal. He wanted to build an energy-efficient home for himself in Ohio, where he was working for Honda"s research and development center before he was transferred to Los Angeles three years ago. Good information about sustainable materials and home construction was hard to come by, he found.

"I was getting reasonably close to figuring it out," Koenig recalls. "In the U.S., it"s difficult to search for and understand how sustainable many products are. It was hard to find sustainable wood--we spent a lot of time investigating it. But individuals can"t afford to spend that much time."

"When we came to visit, I was shocked that it was 74 degrees inside when it was 104 outside," O"Hara says. "You don"t need the noisy air conditioning. In the winter, you come home to a floor that is warm to the touch. It"s very nice."

Honda also designed the home to be three times more water efficient than a typical house. It features dual-flush toilets, an efficient washing machine and dishwasher, and low-flow faucets that shut off automatically. The heat-exchange system also makes it possible to get hot water quickly, without wasting the cold water that often flows out of the faucet first. The home collects and filters gray water--used water from sinks, showers and the dishwasher--to irrigate the drought-resistant plants in the backyard.