

CALIFORNIA DREAMIN'

What once seemed like a dream is about to become reality: Builders in the Golden State soon will be required to construct houses that produce as much energy as they use, thanks to the state's rigorous Title 24 regulations. Here are three examples of how net zero can be achieved with style and efficiency.

BY BUILDER STAFF

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URBAN NET ZERO

A San Francisco rowhouse takes a super-tight approach to energy efficiency

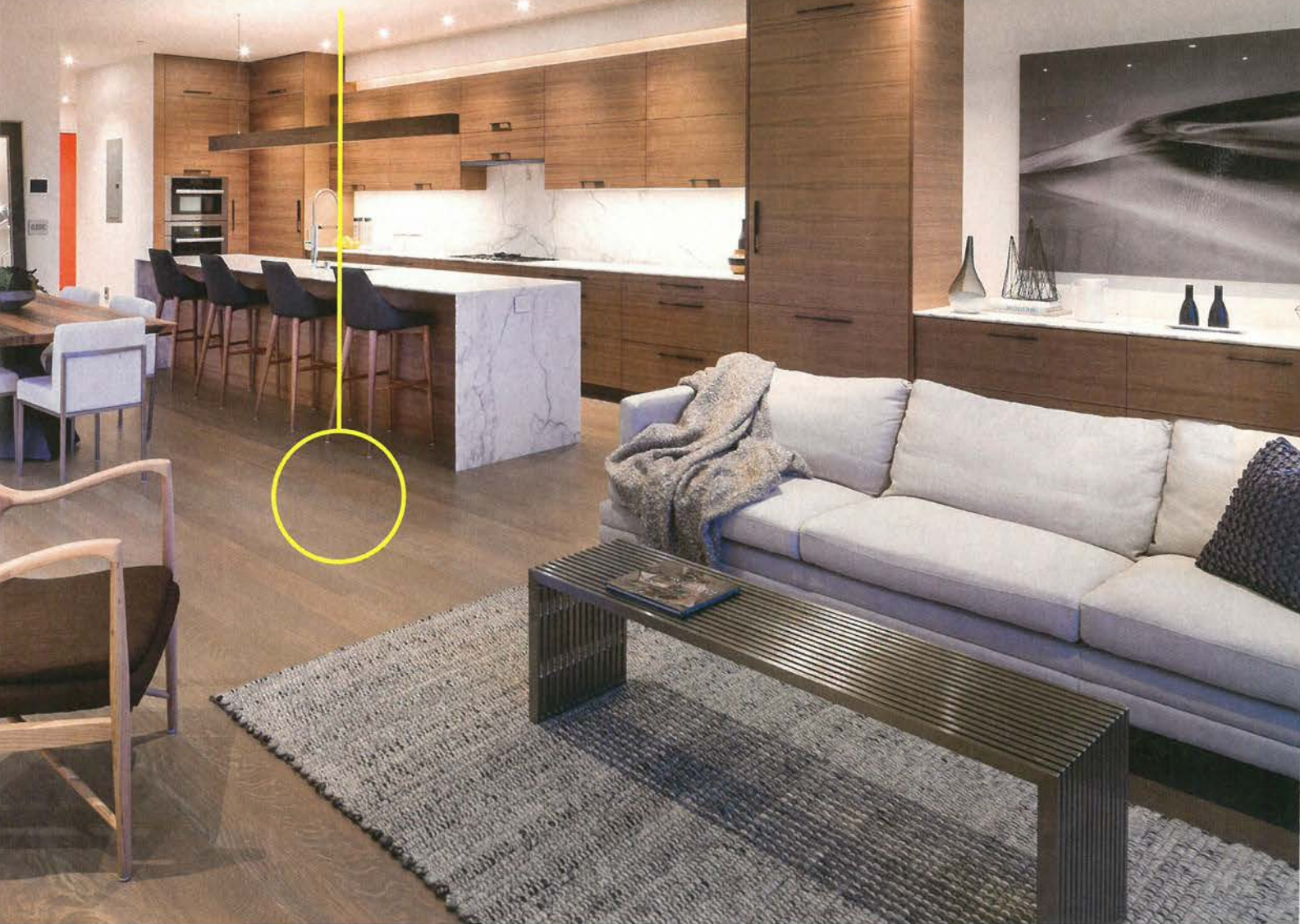
In California, home of the country's most ambitious energy codes, residential builders have to do a lot in order to stand out from the crowd. A recently completed home in San Francisco's Noe Valley neighborhood rises to the challenge, thanks to a one-two punch of building science and renewable energy.

Designed by local firm Hood Thomas Architects, the four-story contemporary house features an open plan and plentiful natural light. Even in relatively

Jacob Elliott Photography

Wall to Wall

Architect Mark Thomas chose quartersawn wide-plank flooring to help the modern home feel warm and inviting.



temperate San Francisco, all the glass is triple-paned for insulating purposes; it's part of the home's Passive House design, a standard developed in Germany. Passive homes are tightly sealed, and their energy use is minimized by a heat recovery system that captures and reuses heat. "If your property is air-sealed, then you decide where and when ventilation happens—you have control over it and can harvest energy from it," says Ewen Utting, developer and founder of San Francisco-based ENU Construction, the project's builder.

The construction of the house, which is wood-framed on a mat-slab foundation, was typical; the difference was in the detailing.

"The air sealing isn't difficult or time consuming, but you have to plan it right from the start," says Utting. "Every pipe penetration in the foundation is air sealed." He applied the same attention to air-sealing the walls and roof.

"The house is its own mini-environment," says principal architect Mark Thomas. The 4,696-square-

Far left:

Multiple patios and a ground-floor garden open the home to sunlight and views.

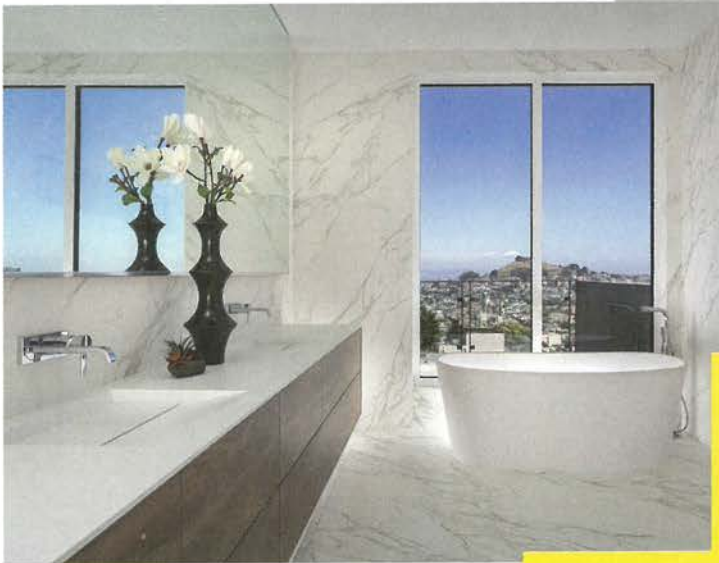
Above:

The living space and kitchen are located on the third level.

PROJECTS

Right:
The top-floor master suite connects seamlessly to a private deck.

Below:
The bathroom window captures views of the city and the bay.



Project Equilibrium House 3
Location San Francisco
Architect Hood Thomas Architects, San Francisco
Builder ENU Construction, San Francisco
Structural Engineer Harrell Kane Structural Engineers, San Francisco
Size 4,696 square feet
Site .06 acre
Construction Cost \$450 per square foot

foot space is conditioned by two Zehnder ComfoAir 350 HRVs. An HRV's small ducts are easy to conceal, which is helpful for achieving the streamlined look of contemporary architecture. The four-level house is clad with an integrally colored composite material called Woodn, integrally colored stucco, and aluminum fascia.

While the design team followed many LEED guidelines for environmentally friendly building materials, Thomas prefers the Passive House standard for its rigor in other areas: "A house can be LEED-certified, but it may not be all that energy efficient," he notes.

With a home built to such high standards, achieving net zero is relatively easy in sunny California. A 5kW system on the roof supplies more



THIRD-FLOOR PLAN



FOURTH-FLOOR PLAN



FIRST-FLOOR PLAN



SECOND-FLOOR PLAN



than enough power for the home and two electric vehicles. Two solar hot-water collectors, which feed a 120-gallon storage tank, are the primary source of hot water for residential use and heating. A hydronic system embedded in the basement slab is sufficient to heat the whole house.

The home, one of the first to meet the Passive House standard in San Francisco, received unanimous approval from the city's planning commission, which gives priority processing to Passive House applications.

"All new construction should be net zero," says Utting. "Concrete and steel are responsible for a huge amount of pollution, so we have to balance their impact by minimizing the home's energy use. You're not going to get a chance to build that house again." — LYDIA LEE

