
Q&A: There is No Price Penalty for Living Green and Carbon-Neutral

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Naomi Porat is co-founder and CEO of ZETA Communities, a San Francisco-based builder of net-zero multifamily communities and a participant in the U.S. Department of Energy's Building America Research Program. Zeta structures are designed to exceed the quality and performance of on-site building, as well as minimize resources, waste and CO2 emissions.

Prior to ZETA, Naomi was COO of an affordable housing product development company, where she led a team of building science professionals in the design, research and development of sustainable building materials and methods for developing countries. She is also co-founder of the Institute at the Golden Gate, a nonprofit global sustainability organization.

Porat talks to *MHN* Associate Editor Erika Schnitzer about how net-zero multifamily housing works, how it affects construction budgets and schedules, and how others in the industry can use this model.

MHN: Explain how net-zero multifamily housing works.

Porat: Net-zero energy (NZE) multifamily housing means that the building occupants' energy consumption is relatively equivalent to the energy production of the building through renewable energy sources; thus, energy consumption nets to zero over the course of one year.

ZETA's strategy for achieving net zero and affordability is to implement aggressive energy conservation methods, use highly efficient building materials and mechanicals, and install our zTherm energy controller system and other proprietary net-zero energy building technologies. As a result, ZETA units require 40 to 60 percent less energy overall and 65 percent less energy for heating, cooling and hot water than a comparable structure (based on data published by ZETA's partner, U.S. Department of Energy's Building America program). The remainder of energy required for the home's electrical load is produced through photovoltaic solar power. The entire system is optimized for thermal comfort and energy efficiency using our zTherm controller technology. In addition, many of ZETA's housing units produce zero CO2 emissions, as the homes use an all-electric system.

ZETA is taking this one step further by proving there is no price penalty for living green and carbon-neutral. We are producing affordable NZE buildings as a scalable solution to climate change today—10 years ahead of the 2020 mandates.





MHN: How does ZETA Communities build differently than traditional multifamily builders? #

Porat: ZETA seeks to transform traditional multifamily housing building practices by demonstrating that high-performance, off-site construction can outperform conventional construction in terms of cost, time and energy. According to an Economist report in 2000, of the \$650 billion industry, \$200 billion was lost to waste, inefficiencies and mistakes. Off-site built multifamily housing allows for a phenomenal reduction of waste and higher level of quality control, making it more sustainable and suitable for urban infill, at no additional cost or compromise on quality or time to delivery.

In terms of multifamily development, high indoor air quality is critical. In the shift to energy efficiency, homes often have a tighter envelope that restrict fresh air, and low quality/high-VOC finishes compound the problem in low-income communities. Dense multifamily, low-income communities are often facing five times poorer indoor air quality relative to outdoor air conditions. Therefore, ZETA has designed its units according to the DOE's Building America standards for high indoor air quality. In addition, ZETA's soundproofing design and building products enhance livability, a particularly important consideration in urban infill and multifamily developments.

Also, as a benefit from "building green" we are creating green collar jobs in ZETA's clean tech building center. Our workers are gaining valuable green collar skills related to the design and construction of NZE building systems and pre-fabricated housing.

MHN: How do you make energy efficiency cost-effective?#

Porat: ZETA radically changes the construction cost equation of labor, materials and time through our off-site, lean construction methods. For example, ZETA's labor represents approximately 15 to 18 percent of total construction costs. Although ZETA uses high-quality, durable materials, our material costs are also lower than site-built due to our precision building methods that reduce waste by about 30 percent. And finally, ZETA's total construction time is approximately 50 percent less than site-built. In addition, ZETA homes are less expensive to maintain and operate due to zero utility bills, moisture-resistant building methods/materials and resilient finishes.

MHN: How does building net-zero multifamily housing affect construction budgets and schedules?#

Porat: The construction of the foundation and the units occurs in parallel rather than linearly, which means construction timeframes can be reduced overall. And with an off-site facility and just-in-time inventory system, there are no weather delays, material shortfalls, worker downtimes or unanticipated site issues that cost valuable time. In urban infill developments, ZETA prices can be 10 to 20 percent lower than site-built. #

MHN: What is the importance of decreasing the impact of the built environment?#



Porat: The built environment accounts for about 50 percent of national energy consumption, 70 percent of electricity consumption and nearly half of all greenhouse gas emissions annually in the U.S. ZETA was founded on the premise that a scalable solution to climate change requires a radical transformation in building methods and materials to minimize the impact on the environment, greenhouse gasses and energy consumption. Affordability and accessibility on a mass market scale is a prerequisite to scalability and market transformation. Over the next five years, ZETA's scaling plan would result in the elimination of 3.2 million tons of CO2 emissions throughout the buildings' lifecycle.

MHN: What multifamily building types can be created using this model?

Porat: ZETA builds a range of multifamily building types in wood frame, including two- and three-story townhomes, up to five-story apartments and condos, and live/work and mixed-use multifamily for urban infill. ZETA specializes in both urban infill, which presents numerous constraints for site builders, and master-planned sustainable communities.

MHN: How can this model be used by other developers and builders, both for multifamily projects as well as for other building types?

Porat: The most cost-effective use of off-site built multifamily developments is for larger scale developments (30 to 200+ units). The more repetitive unit design results in ZETA's ability to offer a lower-cost product (approximately 10 to 20 percent less than site-built) and faster delivery (approximately 50 to 60 percent less time). For a nominal fee, ZETA deploys our team of experts to conduct a feasibility study on each project, which includes a conceptual plan, cost estimate and project schedule, as well as energy system solutions.