

Zero Energy Home



Frequently Asked Questions

Q1. What is a Zero Energy Home?

Zero Energy Homes combine energy-efficient construction, equipment, lighting and appliances with commercially-available renewable energy systems to provide homeowners with annual net-zero energy consumption.

With its reduced energy needs and solar energy systems, a Zero Energy Home (ZEH) can return as much energy as it takes from the utility on an annual basis.

Q2. Who is involved with this program?

The John Wesley Miller Companies and the NAHB Research Center have built the home in the Armory Park del Sol community. All of the homes in the community incorporate thermal mass solid concrete block walls, energy-saving appliances and mechanical equipment, high-performance windows, and solar water heating systems. The standard construction methods in the community already exceed the Model Energy Code by 50 percent.

With the assistance of architects from Devereaux and Associates of McLean, Va., the John Wesley Miller team and engineers at the NAHB Research Center have analyzed many additional energy-efficient and energy-

producing measures. The final home design now provides the comfort of the other Armory Park del Sol homes, while consuming net-zero energy over the course of a year. In partnership, Tucson Electric Power has agreed to run the home's meter backward and credit homeowners when they feed power back to the utility.

The Tucson ZEH is one of four homes that comprise a national initiative administered by the U.S. Department of Energy through its National Renewable Energy Laboratory (NREL). Researchers at NREL are working with the four home building teams to introduce the ZEH concept into the single-family, new home construction industry.

Q3. How does the ZEH differ from the other homes in the community?

Standard homes in Armory Park del Sol are designed to use about 7 kWh per square foot per year—the Zero Energy Home is designed to use about 4 kWh per square foot per year.

Every home in Armory Park del Sol is equipped with a 1-kW solar electric system and a passive solar water heater that meets approximately half of a family's water heating needs. The ZEH has a 3.5-kW solar electric system and an active solar hot water system that is designed to provide almost all of a family's water and home heating needs.

Q4. Have there been product donations to defray the cost of building the home?

The following companies have made product and service donations to the Tucson ZEH:

- **BP Solar** of Linthicum, Md. – Solar electric panels;
- **Carrier Corporation** of Indianapolis, Ind. High-efficiency air conditioner with variable speed air handler and non-ozone-depleting refrigerant;
- **Dankoff Solar Products, Inc.** of Santa Fe, N.M. – Solar system distributors;
- **Kohler Co.** of Kohler, Wis. – Bath and kitchen fixtures;
- **LP Corporation** of Roaring River, N.C. – Radiant-barrier roof decking;
- **Microtherm, INC./SEISCO** of Houston, Texas – Tankless water heater;
- **Milgard Windows** of Tempe, Ariz. – High-efficiency windows;
- **Nora Lighting** of Los Angeles, Calif. – Permanent fluorescent lighting fixtures;
- **Osram Sylvania** of Danvers, Mass. – Fluorescent lamps;
- **Panasonic** of San Rafael, Calif. and **Panasonic Ventilation** of Scottsdale, Ariz. High-efficiency bath fans;
- **Sioux Chief Manufacturing Company Inc.** of Peculiar, Mo. – Plumbing manifold;
- **SMA America, Inc.** of Grass Valley, Calif. Inverters for photovoltaic system;
- **Studor, Inc.** of Dundin, Fla. – Air admittance plumbing valves;
- **SunEarth Inc.** of Ontario, Calif. Engineering of combined solar water and space heating system;
- **Sun Lighting** of Tucson, Ariz. – Lighting design and decorative lighting fixtures;

- **The Solar Store** of Tucson, Ariz. – Solar system installation; and
- **Whirlpool Corporation** of Benton Harbor, Mich. – High-efficiency kitchen appliances and DUET washer and dryer.

Q5. What will happen after the home is built?

NAHB Research Center engineers will monitor energy use and other vital information to prepare an evaluation of the home. Once documented, these results will be made available to the public via the NAHB Research Center's websites, www.nahbrc.org and www.toolbase.org.

Q6. How much did it cost to build the ZEH?

The home cost the company approximately 20 percent above its standard construction practices. This estimate does not include incentives from the state and Tucson Electric Power.

Q7. Where can I find information about the Tucson ZEH once NAHB Research Center testing is complete?

For more information on this and other topics relating to the Tucson Zero Energy Home, contact the **John Wesley Miller Companies** at (520) 325-3313 or via their website at www.armoryparkdelsol.com.