ZERO Energy Homes

energy | efficiency | research & development

Las Vegas, Nevada

The Vinings

Pinnacle Homes

A Real Life Laboratory
Complete with a Zero Energy Home

A suburban Las Vegas housing development is a real-life laboratory for innovative research in renewable energy and conservation. Two identical homes have been built side by side: one using conventional methods and one with innovative new technologies. The prototype combines the expertise of Pinnacle Homes, University of Nevada Las Vegas (UNLV), Nevada Power Company, and ConSol, and is designed to save up to 92% (compared to a Building America benchmark home) on utility costs. Partial support has been furnished by the National Renewable Energy Laboratory (NREL) through the Nevada Southwest Energy Partnership Program.

ConSol is one of the lead team members of the US Department of Energy's Building America program. Building America's goal is to produce Zero Energy Homes by adding renewable energy applications to energy conserving home design, resulting in homes that approach a net zero usage of energy annually. Pinnacle Homes chose ConSol's turn-key energy efficiency program, ComfortWise®, to ensure the most energy efficient home design in The Vinings. The ComfortWise program requires mechanically-engineered HVAC system, tightly-sealed air ducts, spectrally selective glass, and independent third party inspectors who document the quality of the installations of insulation, caulking and sealing, windows, HVAC ductwork and equipment efficiencies. These homes also qualify for the EPA's Energy Star® Homes program.

The prototype is designed to save **92%** on utility costs over Building America benchmark.

BIRA
ConSol serves as the team leader of the Building Industry Research Alliance (BIRA) for the Department of Energy's Building America program. BIRA is a diverse group of thirty-one industry professionals involved in this private/public partnership that provides energy solutions to build production housing up to 50% over existing code.

BIRA Building Industry Research Alliance

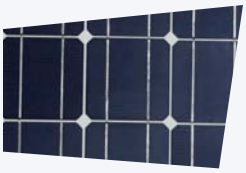
Building America

ConSol

The next step was to integrate other technologies designed to minimize energy consumption and generate electricity, including:

A highly energy efficient “T-Mass” insulated concrete wall system developed by the Dow Corporation is used on all exterior walls.

A Copper Sun solar water heating system looped into the home's heating system minimizing natural gas consumption for hot water heating.



Approximately 400 square feet of roof-mounted photovoltaic panels manufactured by GE will generate electricity. During low usage periods, electricity will be fed back onto Nevada Power’s grid, helping offset energy use.

Highly-efficient water-cooled condensing units manufactured by Freus will be part of the air conditioning system.

ConSol provided energy efficiency strategies, simulation and energy analyses during the design aimed at phase towards reaching the net zero energy goals. ConSol and UNLV will be monitoring the energy performance of the Zero Energy Home. The monitoring of both homes over time will provide the data to evaluate costs and benefits. The monitored data will be used to compare the performance the homes against each other as well as against the simulation and analyses results. The 1,610 square foot prototypes will serve as model homes for Pinnacle Homes in The Vinings development and will be open to the public for one year.

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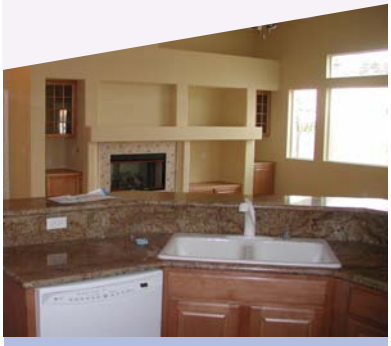

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Features	Building America Benchmark House	Zero Energy House
Walls	R-19	T-mass (R-38)
Windows	Aluminum frames	Vinyl frame with spectrally selective glass
Attic	R-30	R-38
AC Unit	10 SEER (Conventional air to air system)	19 SEER (Freus water cooled condenser system)
Duct Work	Attic	Conditioned Space
Water Heating	Conventional	Solar water heater with tankless gas heater
Backup Plumbing	Uninsulated	R-4 insulation
Lighting	Incandescent	Compact flourescent
Heating	Standard forced air	Hydronic
Electrical Generation	None	GE Energy 5.0 kW DC roof-integrated PV system
Roof Sheeting	Conventional	Reflective
Exterior Slab	No Insulation	Insulation
Energy Savings		**92%**