


New Building Approach Saves Energy and Cost


Retreat at the Bluffs Prototype Pulte Homes — Tucson, Arizona


Building America is sponsored by the U.S. Department of Energy. The program aims to:


- Build 2,000 efficient, affordable homes by the end of 2000
- Reduce energy use by 50% and reduce construction time and waste
- Improve indoor air quality and comfort
- Encourage a systems-engineering approach for design and construction of new homes.

An innovative prototype house built by Pulte Homes as part of the U.S. Department of Energy's Building America program in Tucson, Arizona, saves money for the home owner by reducing electric air-conditioning costs and gas-heating costs with little or no additional investment. Pulte selected the following package of features to achieve 50% heating and cooling energy savings relative to the 1995 Model Energy Code in the hot, dry Tucson climate:

 **Windows** — Spectrally selective glass, which lets visible light through but keeps the solar heat gain out. This lowers the cooling load during the summer and reduces the fading of furniture caused by direct sunlight. The smaller cooling load resulting from the use of spectrally selective glass is a key system interaction that allows the purchase of a smaller, less expensive air conditioner.

 **Roofing System** — Unvented roofing system, which changes the home's thermal barrier from the ceiling to the roof deck. Ductwork for air conditioning and heating is located inside the conditioned space.

 **Heating and Cooling Systems** — The high-efficiency furnace saves energy and its sealed-combustion design prevents the leakage of potentially harmful combustion products. The energy-efficient SEER-12 (seasonal energy efficiency ratio) air conditioner uses less electricity to keep the house cool and comfortable in the summer. In addition, windows with spectrally selective glass allow an air conditioner sized up to 30% smaller than it would otherwise be.

 **Comfort** — Improved comfort resulting from less solar heat gain and greater insulation. The highly insulated wall assembly includes 2" x 6" framing, 24" on-center, a construction practice that conserves wood and reduces labor costs. The wall cavities are filled with sprayed-in cellulose insulation, which is a nontoxic material made from recycled newspaper. A layer of foam insulation is also placed on the exterior wall under the stucco.



Chris Mooney/PIX07746

This Building America house built by Pulte Homes in Tucson exceeds Energy Star requirements and features an unvented roof, spectrally selective windows, and high-efficiency heating and cooling systems.

Pulte Homes is working with the Building Science Consortium, one of the five Building America industry teams, and is currently constructing similar houses in three Tucson communities. All of these houses receive Energy Star labels, which certify that the energy efficiency is at least 30% better than typical construction. The Energy Star program is a cooperative effort of the U.S. Department of Energy and the U.S. Environmental Protection Agency. Houses built by Pulte's Las Vegas division with a similar package of features received an Energy Value Housing Gold Award in 1999 from the National Association of Home Builders.





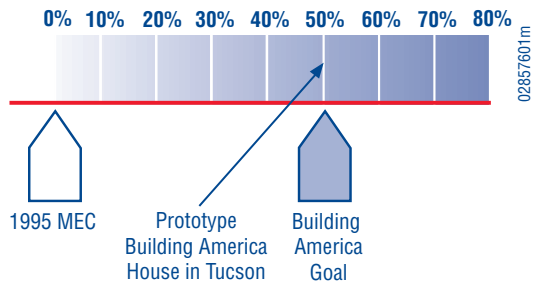
Energy savings for heating and cooling are guaranteed through GreenStone's Engineered for Life™ program. In addition, home buyers can often qualify for more favorable mortgage terms because less disposable income is spent on energy bills.

The Approach

Building America's systems-engineering approach unites segments of the building industry that have traditionally worked independently of one another. It forms teams of architects, engineers, builders, equipment manufacturers, material suppliers, community planners, mortgage lenders, and contractor trades. More than 150 different companies make up the five Building America teams:

-  Building Science Consortium (BSC)
-  Consortium for Advanced Residential Buildings (CARB)
-  Hickory Consortium
-  Industrialized Housing Partnership
-  Integrated Building and Construction Solutions (IBACOS) Consortium

Building America Performance Goal (Heating and Cooling Energy Savings)



VISIT OUR WEB SITES AT:

WWW.EREN.DOE.GOV/BUILDINGS/BUILDING_AMERICA

WWW.PATHNET.ORG/HOME.HTML

WWW.ENERGYSTAR.GOV



TO LEARN MORE ABOUT BUILDING AMERICA, CONTACT:

Pulte Corporation

Alan Kennedy • Pulte Tucson Division • 7493 North Oracle, Suite 115 • Tucson, Arizona 85704
(520) 797-1100 • fax: (520) 797-1420 • e-mail: akennedy@pulte.com • www.pulte.com

Building America Program

George James • Building America Program • Office of Building Systems, EE-41 • U.S. Department of Energy
1000 Independence Avenue, S.W. • Washington, DC 20585-0121 • (202) 586-9472 • fax: (202) 586-8134
e-mail: George.James@ee.doe.gov • www.eren.doe.gov/buildings/building_america

Building Science Consortium

Betsy Pettit • 70 Main Street • Westford, Massachusetts 01886 • (978) 589-5100 • fax: (978) 589-5103
e-mail: Betsy@building-science.com

National Renewable Energy Laboratory

Ren Anderson • 1617 Cole Boulevard, MS4111 • Golden, Colorado 80401 • (303) 384-6191 • fax: (303) 384-6226
e-mail: ren_anderson@nrel.gov

Energy Efficiency and Renewable Energy Clearinghouse at: 1-800-DOE-3732



Printed with a renewable-source ink on paper containing at least 50% wastepaper, including 20% postconsumer waste

July 2000 NREL/FS-550-28576