



The New American Home®

The New American Home®

Atlanta, GA - 2001

Specifications

HERS 90, 3.0 ACH Air-tightness Target

Low-E Windows, U=0.33, SHGC=0.32

One Air Handler Unit for 2nd and 3rd floors, one serving 1st floor and basement

Housewrap weather barrier, Cedar Breather

Airtight Attic Knee Wall, Mechanical Room on 3rd floor

Energy Recovery Ventilator delivers fresh air to return plenum in each air handler

Ductwork leakage target 140 cfm each system

Carrier condensing units efficiency to 12 SEER, 5 Tons

Direct Vent Gas Furnaces, 96% AFUE



The New American Home®, an annual showcase project designed by committee and co-sponsored by the National Association of Home Builders' (NAHB's) National Council of the Housing Industry (NCHI), BUILDERS Magazine and Ladie's Home Journal, was a once-in-a-lifetime project for Hedgewood Properties. To design and build a home that is attractive as well as energy efficient, Hedgewood teamed up with Building America's IBA-COS Consortium and Southface Energy Institute, a nonprofit environmental building group based in Atlanta. In this home, the challenge of building to reach the Home Energy Rating System (HERS) level of 90 was achieved. The EPA/DOE will present Hedgewood with the Energy Star Award for their achievement in this home. The fact that this home has such a high level of energy efficiency, when it includes so many esthetic features and lifestyle products, is a tribute to the construction efforts undertaken by Hedgewood.

Hedgewood's primary goal for The New American Home® was that it should establish a level of energy efficiency not seen before at a display home for the International Builders' Show while keeping upgrade costs within reason. Since Hedgewood invested in creating a very efficient envelope for this home (comprised of high performance windows, enhanced building airtightness, and duct sealing) they were able to use two air handling units instead of three. Additionally, they used SEER 12 equipment to show other builders that high efficiency does not mean radically increased construction cost.

Durability was of great importance in the design of The New American Home®. Along those lines, particular attention was paid to the airtightness work done in the cathedral ceiling, and the flashing of the windows. Additionally, the drainage control measures conducted on the walls will enhance the overall durability of the home. Valuable lessons in the areas of airtightness and moisture control were realized by the builder during this process. The result is that Hedgewood should benefit from reduced warranty and liability claims.

The New American Home® will be extensively monitored for one year while occupied. This activity starts in March 2001 when the owner of the home moves in. Monitoring data will be posted at a special Internet site and will be accessible to individuals and organizations involved in the project.

The New American Home® Primary Goals

-  Build high profile, uniquely designed showhome for International Builders' Show, to Building America energy efficiency level (HERS 90).
-  Construct home with greater attention to durability aspects.



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OFFICE OF BUILDING TECHNOLOGY, STATE AND COMMUNITY PROGRAMS
ENERGY EFFICIENCY AND RENEWABLE ENERGY • U.S. DEPARTMENT OF ENERGY

The New American Home®

Features and Benefits

Performance Features:

Thermal shell

- Superior Wall System foundation
- R-19 walls

Airtightness

- Sealed penetrations
- Mechanical room in loft
- Air barrier at exterior bath tubs

Rain Control

- Roof/wall & window flashing integrated well into house wrap

Moisture Control

- Air space maintained throughout vaulted ceiling at foil faced roof sheathing
- Airspace behind cedar wall shingles

Duct Air Leakage

- Mastic sealant used on duct joints

HVAC

- HVAC in conditioned space

Ventilation

- Energy recovery ventilator

Details

- Sound control in theater
- Wine cellar with separate HVAC

As the centerpiece display home for the International Builder's Show, The New American Home® (TNAH) sports qualities unlike that of any other show home. Energy efficient design is a paramount characteristic of TNAH. The home will use 45% less energy for heating, cooling and hot water heating than a home comparable in size. By improving various parts of the home incrementally, this goal was achieved with a minimal cost impact. As an example, thermal performance of walls was maximized to the most practical extent and both HVAC units were positioned in conditioned space instead of the attic to reduce cooling loads.

This section highlights specific features and benefits unusual to The New American Home.



Well integrated flashing/ housewrap.



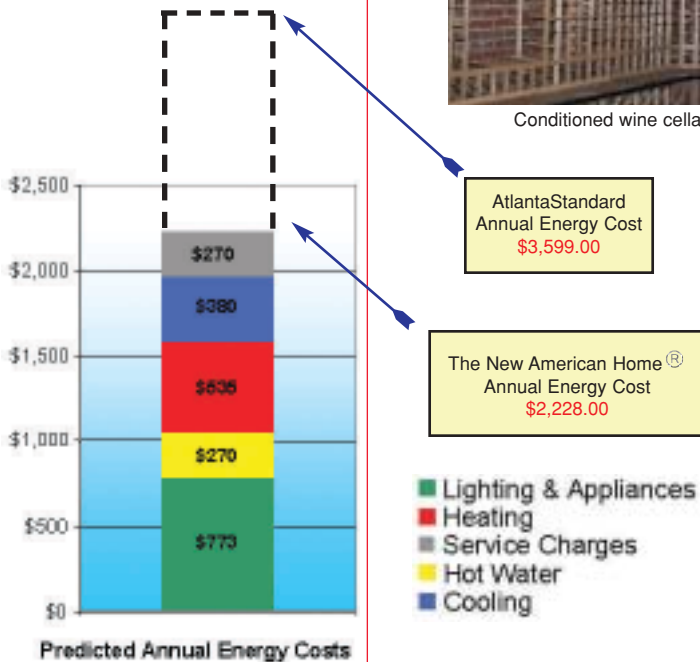
Superior Wall system featuring R-5 foam board insulation (exterior face) and R-19 batt insulation (wall cavities).



Conditioned wine cellar.



Large vaulted ceiling buffered with one inch of Owens Corning FOAMULAR to prevent moisture accumulation (above). Cavity filled with R-19 fiberglass batt insulation to give the roof a nominal R-24 value (right).



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.

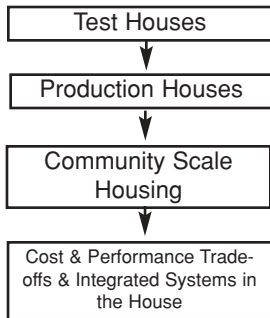
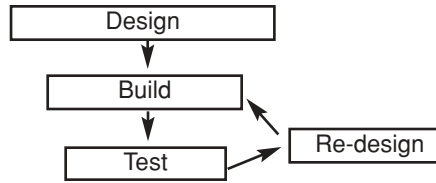
The concept is simple. The systems engineering approach can make America's new homes cost effective to build and energy efficient to live in. Energy consumption of new houses can be reduced by as much as 50% with little or no impact on the cost of construction.

In order to reach this goal, Building America teams work to produce houses that incorporate energy and material saving strategies from design through construction.

First, teams work to analyze and select cost effective strategies for improving home performance. Next, teams evaluate design, business, and construction practices within individual builder partnerships to identify cost savings.

Cost savings can then be reinvested to improve energy performance and product quality. For example, a design that incorporates new techniques for tightening the building envelope may enable builders to install smaller, less expensive heating and cooling systems. The savings generated in this process can then be reinvested in high-performance windows that further reduce energy use and costs.

The "pilot home" or "test" home is the field application of solution analysis. The team builds this prototype home according to their strategic design, tests each system for efficiency, and makes any necessary changes to increase efficiency and cost effectiveness. Before additional houses are built, these changes are incorporated into the original design. This process of analysis, field implementation, re-analysis and design alteration facilitate ultimate home performance once a design is ready for use in production or community-scale housing.



Understanding of the interaction between each component in the home is paramount in the systems engineering process. Throughout the design and construction process, careful consideration is made to the relationship between building site, envelope, mechanical systems, and other factors. The recognition that features of one component can dramatically affect the performance of others enables Building America teams to engineer energy saving strategies at little or no extra cost. System trade-offs, like tightening a shell to enable the use of a smaller HVAC system, can improve the quality and performance of a home without increasing cost to builder or consumer.

Advantages to Builder



- Reduces construction costs
- Improves productivity
- Improves building performance
- Reduces callback and warranty problems
- Allows innovative financing due to predictably lower utility bills
- Gives builder a competitive advantage

Advantages to Consumer



- Increases quality without increasing cost
- Increases comfort and performance
- Does not detract from the home's aesthetic value
- Reduces utility bills
- Allows greater financing options

Systems engineering cost-saving trade-offs include:



- Advanced framing systems
- Tightly sealed house envelopes
- Shorter, less costly ductwork
- Disentangling the infrastructure
- Smaller, less expensive mechanical systems
- Modular construction



Advanced Framing Systems



Tightly Sealed House Envelopes



Shorter, Less Costly Ductwork



Disentangling the Infrastructure



Smaller, Less Expensive Mechanical Systems



Modular Construction

VISIT OUR WEB SITES AT:

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BUILDINGS FOR THE 21ST CENTURY

Buildings that are more energy-efficient, comfortable, and affordable ... that's the goal of DOE's Office of Building Technology, State and Community Programs (BTS). To accelerate the development and wide application of energy efficiency measures, BTS:

- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment, and appliances
- Promotes energy-/money-saving opportunities to both builders and buyers of homes and commercial buildings
- Works with state and local regulatory groups to improve building codes, appliance standards, and guidelines for efficient energy use
- Provides support and grants to states and communities for deployment of energy-efficient technologies and practices.

Building America Overview

The Program

The U.S. Department of Energy's Building America Program is reengineering the American home for energy efficiency and affordability. Building America works with the residential building industry to develop and implement innovative building processes and technologies—innovations that save builders and homeowners millions of dollars in construction and energy costs. This industry-led, cost-shared partnership program uses a systems engineering approach to reduce energy use, construction time, and construction waste by as much as 50%.

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. There are five teams comprising more than 180 different companies.

The Results

Each Building America team is constructing test homes and developing community-scale projects that incorporate its systems innovations. More than 1,800 energy efficient houses have been built by the teams to date.

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