

# Insulated Concrete Homes Increase Durability and Energy Efficiency

## Mercedes Homes — Melbourne, Florida

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

- 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.
- Develop system cost/performance tradeoffs that improve housing quality and performance without increasing cost.

New houses designed by Mercedes Homes, with technical support from the U.S. Department of Energy's Building America Program, save their homeowners money by using energy efficient features such as a high performance heat pump and solar control glazing to reduce cooling costs. The poured in place concrete walls increase the durability of the homes while speeding up the construction process.

Mercedes selected the following energy efficient features in its effort to achieve the Building America 30% space conditioning goal.

-  **Wall Construction** — Wall construction is 6-inch, poured-in-place concrete, which is 9-feet high, and is cast using modular aluminum forms. A layer of 3/4-inch foil-faced, rigid foam sheathing on the inside of the concrete increases the insulation value of the wall relative to regional standard practice.
-  **Windows** — Glass is single-glazed with a hard coat, low-emissivity (low-e) coating that allows visible light through and reduces solar heat gain by 30%.
-  **Cooling System** — A smaller cooling system is used because improved air-tightness and energy efficiency measures reduce the cooling load by 30%. A high-performance SEER 11 system was chosen to further reduce energy use.
-  **Comfort** — Improved comfort resulting from reduced solar heat gain and high-mass walls.



*Mercedes poured concrete homes are easier to build, more energy efficient, and more wind resistant than standard masonry construction.*

Mercedes Homes is working with the Consortium for Advanced Residential Buildings (CARB), one of the five Building America industry teams, and is currently constructing houses to these Building America standards in several central Florida communities. All Building America houses built by Mercedes receive an Energy Star label that certifies the performance rating of these houses is at least 30% better than the Energy Star reference house based on the Model Energy Code. The Energy Star program is a joint effort of the U.S. Department of Energy and the Environmental Protection Agency.





## 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:

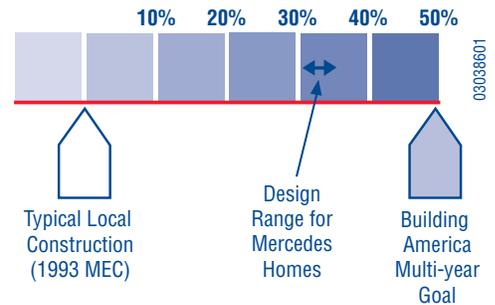
- Conducts R&D on technologies and concepts for energy efficiency, working closely with the building industry and with manufacturers of materials, equipment, and appliances
- Promotes energy-/money-saving opportunities to both builders and buyers of homes and commercial buildings
- Works with state and 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.

## 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 230 different companies make up the five Building America consortium:

-  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)



The teams design houses from the ground up, considering the interaction between the site, building envelope, mechanical systems, and other factors. With this approach, the teams can incorporate energy-saving strategies at little or no extra cost.

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TO LEARN MORE ABOUT THIS BUILDING AMERICA PROJECT, PLEASE CONTACT:

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An electronic copy of this factsheet is available on the Building America Web site:  
[www.eren.doe.gov/buildings/Building\\_America](http://www.eren.doe.gov/buildings/Building_America)



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