Building America: Making Real Progress for U.S. Homes

The U.S. Department of Energy (DOE) Building America Program conducts innovative housing research on energy efficiency to benefit the residential building industry and the public. The program has produced more than 100 innovations and accelerated the adoption of energy-saving technologies. Since 1995, this work has helped households across the nation save up to $54 billion and avoid the emissions of 500 million tons of carbon dioxide. DOE estimates as much as $170 in homeowner savings for every dollar spent by the Building America Program.

National Goals

Continued technical innovation and demonstration offer substantial opportunity to improve the comfort, durability, and indoor air quality of American homes while reducing their associated energy costs.

DOE's goals for Building America are to demonstrate by 2020:

- Cost-effective deep energy savings of 60% for new homes and 40% for existing homes (from 2010 levels).
- Cost-effective savings of at least 5% (relative to a 2010 baseline) in key individual technology areas.

To meet these goals, Building America has a three-step strategy:

- Demonstrate innovative energy-efficient technologies—integrated into test homes—that reduce energy use.
- Expand the use of these energy-saving technologies by partnering with leading builders and demonstrating market demand.
- Accelerate market-wide adoption of these energy-saving solutions through voluntary programs and eventual model energy codes.

Today, many Building America innovations that improve the lives of families are hidden in the walls, ceilings, and systems of American homes.

National Progress

Building America moves research into the market by providing solutions for code and voluntary residential energy efficiency programs.

Building Energy Codes

Energy codes continue to improve because of Building America. Close to 45 states have active residential building energy code programs that use the lessons learned from Building America. Today's energy codes offer 35% greater savings than those of 20 years ago.

EPAs ENERGY STAR® for Homes Program

These homes have numerous Building America innovations built into the energy-savings specifications that exceed building codes. More than 1.5 million homes have earned the ENERGY STAR label, with energy savings of approximately 30% more than a typical new home and tens of millions of dollars saved during the life of these homes.

Building AMERICA® U.S. Department of Energy

DOEs Zero Energy Ready Home Program

This voluntary labeling effort with leading builders identifies homes that can reach zero energy with renewable energy. Solutions from Building America research underpin this program. As of 2015, more than 270 builders participate in the program and have built nearly 400 homes in more than 33 states.

Innovative Solutions

Building America focuses on available savings opportunities by going beyond equipment efficiency and addressing other key aspects of homes and their systems (e.g., thermal integrity, heating and cooling systems).

Building America has helped to provide builders with new solutions to improve homes since its beginning.

The following are just a few Building America innovations:

- Increased insulation in homes by 50% through alternative construction techniques. These techniques are now included in the ENERGY STAR for Homes Program and in the national energy code.
- Improved the efficiency of home heating and cooling systems by up to 30% through the use of high-efficiency

equipment combined with improvements in the delivery of air throughout the house for improved comfort. These improvements are now included within the national appliance standards and the model energy code for homes.

- Improved the indoor air quality of homes through a variety of technical solutions and industry guidance, including a low-cost ventilation system. This work served as the foundation for the ASHRAE 62.2 indoor air-quality standard.
- Developed solutions for insulating and sealing attics and basement crawl spaces. These solutions allow builders to place air distribution systems or air ducts within the attic, providing improved energy efficiency and comfort for homeowners. These innovations are now part of the latest energy code.
- Advanced framing systems and packages
- High-R walls
- Furnace blower performance improvements
- Simplified duct distribution
- Buried encapsulated ducts
- Outside air ventilation controller

DOEs Zero Energy Ready Home and Building America Programs

The U.S. Department of Energy Zero Energy Ready Home and Building America programs are providing technical solutions to reduce the cost and challenges associated with building Zero Energy Ready Homes. With DOE's efforts, our nation's builders are building zero energy ready homes—the homes of tomorrow—in all climates.

Building America and the Future of Housing

DOE is dedicated to improving future generations of homes, focusing on a target of zero energy ready homes—coupled with renewable energy options—at affordable prices.

DOE is addressing problems that limit further improvements to increased energy efficiency by:

- Developing solutions for increased insulation levels in walls by effectively managing moisture buildup that may inadvertently enter the wall system from humidity or rainwater.
- Improving humidity control where cooling equipment may not reduce humidity to comfortable levels in particular climates.
- Developing effective approaches to increase indoor air quality at reduced cost for builders and homeowners by ensuring fresh air and reduced exposure from household contaminants.

Past and Future Research

The Building America Solution Center provides easy access to Building America research at *www.basc.energy.gov.*

The Building America Research-to-Market Plan and Technology-to-Market Roadmaps provide direction for the program during the next five years at *http://tinyurl.com/hk9xtpy.*

Home Energy Matters

- Housing represents 21% of U.S. energy use, 37% of U.S. electricity use, and 21% of U.S. carbon dioxide emissions.
- Small businesses are the backbone of the U.S. economy and the primary source of jobs for Americans. According to the National Association of Home Builders (NAHB), 70% of single-family home builders, 84% of residential remodelers, 61% of land developers, and 74% of specialty trade contractors qualify as small businesses.
- The housing sector significantly under invests in technical innovation and research, development, and deployment for energy efficiency—less than 0.4% compared to the U.S. industry average of 3%—and takes 10 to 25 years to adopt new energy-saving technologies and techniques without a catalyst such as Building America.
- Many homes built prior to modern-day codes have a cost-effective savings potential of 20% or more.

Communities and Businesses Support Building America

"Pulte has been working with the Building America Program since it began. Building America has helped our business research and develop strong new high-performance products that keep us competitive and offer our homebuyers exceptional efficiency and quality."
—Robert Broad, PulteGroup Southern California/Southern Nevada Division

"We used the U.S. Department of Energy's Building America program and its work with the energy efficiency industry to bring state-of-the-art construction innovations and resources to the public."
—Carolyn G. Goodman, Mayor of Las Vegas, Nevada

"Building America provides a much-needed resource to our business and the industry. As a new home builder, we rely on the program to develop and demonstrate innovative technologies before we take the risk of putting them into our construction practices. Without Building America, the construction industry would have great difficulty adopting new practices."
—Tom Wade, Palo Duro Homes

Learn More:

www.buildingamerica.gov

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