

## Building America Puts Residential Research Results To Work

Residential buildings use more than 20% of the energy consumed annually in the United States. To help reduce that energy use, the Department of Energy (DOE) and its Building America partners conduct research to develop advanced building energy systems that make homes and communities much more energy-efficient. DOE and its partners design, build, and evaluate attractive, comfortable homes that increase performance with little or no increase in construction costs.

DOE-sponsored systems integration research also helps to create building systems and dwellings that meet stringent requirements for reliability, durability, and ease of construction and maintenance. Government-industry teams provide the technical support needed to implement key research results, as demonstrated in more than 25,000 homes across the nation.

In addition to increasing energy efficiency, ongoing research focuses on integrating onsite power systems, including renewable energy technologies. Onsite systems can produce as much energy as the building uses, resulting in zero net energy use. All these research activities enhance the nation's energy security by allowing us to use our domestic resources more wisely.






Paul Norton/PIX12397





This New American Home built by Building America partner IBACOS (Integrated Building and Construction Solutions) in Las Vegas, Nevada, was designed with energy efficiency as well as comfort in mind.

### *Who benefits from energy-efficient homes?*

#### *Consumers:*

-  Lower energy bills and maintenance costs
-  More money for things other than energy
-  Healthier, more comfortable, more durable homes

#### *The nation:*

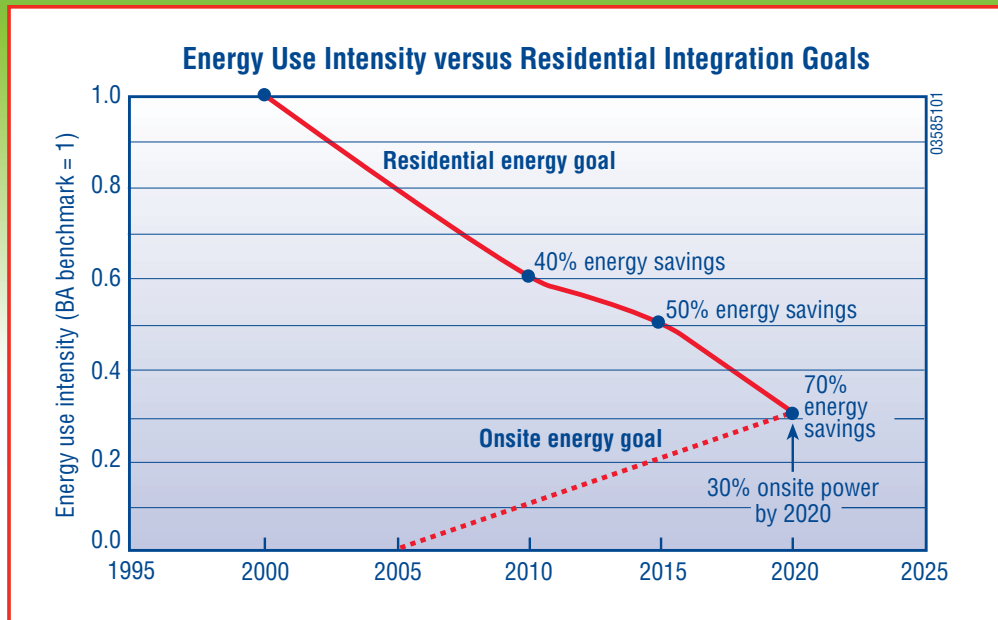
-  Wise use of resources through energy savings
-  Greater energy security through the use of domestic resources
-  A healthier environment through reduced emissions
-  Increased use of onsite power and renewable energy systems

### Partners

DOE's Building America partnership works on a cost-shared basis with more than 470 industry partners. Partners include leading national and regional builders who produce about 50% of all new housing, local home building associations, and individual builders.

Partners can also be experts in home construction, equipment, architecture, engineering, community planning, and mortgage lending. Private-sector partners contribute all the construction materials and labor costs of Building America's research homes and communities.

In addition, Building America provides energy research support to a broad range of residential building programs and partnerships, including ENERGY STAR® Homes, several state programs (such as ComfortWise in California), and the Partnership for Advancing Technology in Housing (PATH).



## Goals

The primary goal is to enable industry to adopt systems engineering approaches to the design and construction of a large portion of all new housing. The Building America Program is aiming for a 70% reduction in energy use and up to a 30% increase in onsite power in new residential buildings by the year 2020.

Another important goal for Building America's research is to integrate the performance of a building's envelope (the foundation, walls, windows, and roof) with its mechanical systems (space and water heating, cooling, and ventilation) for maximum energy savings. With high-performance building envelopes, builders can install smaller, less expensive heating, ventilating, and air-conditioning systems.

Because thousands of U.S. homes are renovated each year, research partners also investigate the best ways to make existing homes more energy-efficient, based on lessons learned from research in new homes. The Building America program is aiming for a 20%–30% reduction in energy use in existing homes.

With continued funding and support, DOE can expand Building America's research partnerships and ensure that we can reduce home energy use in the coming years while integrating advanced, onsite power systems for greater energy security. Visit the Building America Web site at [www.buildingamerica.gov](http://www.buildingamerica.gov) to learn more about Building America and for a full listing of Building America house projects with detailed specifications.

## Achievements

The Building America approach has been used in the design of more than 25,000 houses in 34 states. And full-scale communities are already under way in 19 states. In these high-performance, energy-efficient homes and communities, Building America partners are showing that homes can be durable, high-quality, and comfortable while requiring much less energy.



Building America researchers analyze the whole-house energy performance of newly constructed homes by conducting different types of field tests. In this photo, a Building America staff member performs a duct blaster test to measure the impact of duct leakage on whole-house performance.

Warren Gretz/PIX04869

## Fast Facts

### About Residential Buildings and Building America

- ❑ Building America research focuses on the development of methods to integrate residential energy systems that reduce home energy use by 40%–70% and increase the use of onsite residential power and renewable energy systems by up to 30%. Research results will also contribute 20%-30% savings in existing homes
- ❑ DOE estimates that the residential sector contributes 313.4 metric tons of carbon dioxide emissions to the environment annually. Trimming a typical American home's energy use by even 60% would significantly reduce emissions, and Building America's goal is 70%.
- ❑ Because residential buildings use more than 20% of the primary energy (energy embodied in natural resources such as coal, oil, and biomass) consumed in the United States each year, they are a key element of DOE's R&D in energy-efficient solutions for consumers and communities.
- ❑ Today, the average monthly utility bill for about 100 million U.S. homes is around \$133.
- ❑ More than 6 million workers in the U.S. construction industry and related trades build more than 2 million new homes every year.
- ❑ Residential construction has been one of the bright spots in the U.S. economy in recent years, accounting for more than 4.76% of our gross domestic product (GDP).
- ❑ DOE's investment in industry-driven systems engineering research through Building America supports energy conservation goals of the National Energy Policy.
- ❑ Besides Building America, there are very few ways to conduct research required by U.S. building industry professionals in order to integrate energy-efficient new systems—equipment, techniques, designs, and strategies for improving a home's quality and performance. The U.S. residential construction industry (excluding product manufacturers) invests less than 0.5% of total home sales in R&D; other major industries invest about 3%–4% of total sales.
- ❑ As a government-industry partnership, Building America is able to integrate national building energy research results and disseminate those results to tens of thousands of companies, contractors, and builders.
- ❑ Building America partners include leading manufacturers and other key industry members; in all, about 470 manufacturers, contractors, and builders directly participate in research projects each year.
- ❑ Research done by Building America partners helps to make homes more affordable; using less energy means paying lower utility bills and having more money to purchase the home itself and other essentials.
- ❑ Through systems R&D, DOE's Building America partnership (1) helps both traditional builders and manufacturers of modular homes reduce construction time and waste up to 50%; (2) provides new product opportunities for U.S. manufacturers and suppliers; and (3) through education and outreach, helps consumers select high-quality, high-performance homes.
- ❑ Private industry partners match every tax dollar invested in Building America; industry pays for all the construction labor and material costs of test and research homes.
- ❑ Through continued support and funding, we can make sure that the gains and innovations already achieved by Building America partners, and the achievements to come, will not be lost.



**This Building America Home was constructed in Longmont, Colorado, by McStain Enterprises and features energy-efficient insulation, ductwork, and windows as well as recycled building materials.**



## A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

## Research and Development of Buildings

Our nation's buildings consume more energy than any other sector of the U.S. economy, including transportation and industry. Fortunately, the opportunities to reduce building energy use—and the associated environmental impacts—are significant.

DOE's Building Technologies Program works to improve the energy efficiency of our nation's buildings through innovative new technologies and better building practices. The program focuses on two key areas:

### • Emerging Technologies

Research and development of the next generation of energy-efficient components, materials, and equipment

### • Technology Integration

Integration of new technologies with innovative building methods to optimize building performance and savings

For more information contact:  
EERE Information Center  
1-877-EERE-INF (1-877-337-3463)  
[www.eere.energy.gov](http://www.eere.energy.gov)



U.S. Department of Energy  
**Energy Efficiency  
and Renewable Energy**

An electronic copy of this factsheet is available on the Building America Web site at [www.buildingamerica.gov](http://www.buildingamerica.gov)

## DOE's key role in residential buildings research is to—

- Be a catalyst for cost-shared research in residential construction—research that the private sector cannot undertake by itself
- Bring the right research partners together for government-industry projects
- Disseminate research results to a broad audience of industry professionals
- Reduce the risk and increase the reliability of emerging technologies so they can be manufactured and used widely
- Provide direct access to the scientific expertise of the DOE national laboratories
- Focus on high-performance, whole-building, systems engineering approaches that meet national goals for energy efficiency and energy security.

## Visit our Web sites at:

[www.buildingamerica.gov](http://www.buildingamerica.gov)

[www.pathnet.org](http://www.pathnet.org)

[www.energystar.gov](http://www.energystar.gov)



### Building America Program

George S. James • New Construction • 202-586-9472 • fax: 202-586-8134 • e-mail: [George.James@ee.doe.gov](mailto:George.James@ee.doe.gov)

Terry Logee • Existing Homes • 202-586-1689 • fax: 202-586-4617 • e-mail: [terry.logee@ee.doe.gov](mailto:terry.logee@ee.doe.gov)

Lew Pratsch • Integrated Onsite Power • 202-586-1512 • fax: 202-586-8185 • e-mail: [Lew.Pratsch@hq.doe.gov](mailto:Lew.Pratsch@hq.doe.gov)

Building America Program • Office of Building Technologies, EE-2J • U.S. Department of Energy • 1000 Independence Avenue, S.W. • Washington, D.C. 20585-0121 • [www.buildingamerica.gov](http://www.buildingamerica.gov)

### Building Industry Research Alliance (BIRA)

Robert Hammon • ConSol • 7407 Tam O'Shanter Drive #200 • Stockton, CA 95210-3370 • 209-473-5000 • fax: 209-474-0817 • e-mail: [Rob@consol.ws](mailto:Rob@consol.ws) • [www.bira.ws](http://www.bira.ws)

### Building Science Consortium (BSC)

Betsy Pettit • Building Science Consortium (BSC) • 70 Main Street • Westford, MA 01886 • 978-589-5100 • fax: 978-589-5103 • e-mail: [Betsy@buildingsscience.com](mailto:Betsy@buildingsscience.com) • [www.buildingscience.com](http://www.buildingscience.com)

### Consortium for Advanced Residential Buildings (CARB)

Steven Winter • Steven Winter Associates, Inc. • 50 Washington Street • Norwalk, CT 06854 • 203-857-0200 • fax: 203-852-0741 • e-mail: [swinter@swinter.com](mailto:swinter@swinter.com) • [www.carb-swa.com](http://www.carb-swa.com)

### Davis Energy Group

David Springer • Davis Energy Group • 123 C Street • Davis, CA 95616 • 530-753-1100 • fax: 530-753-4125 • e-mail: [springer@davisenergy.com](mailto:springer@davisenergy.com) • [deg@davisenergy.com](mailto:deg@davisenergy.com) • [www.davisenergy.com/index.html](http://www.davisenergy.com/index.html)

### IBACOS Consortium

Brad Oberg • IBACOS Consortium • 2214 Liberty Avenue • Pittsburgh, PA 15222 • 412-765-3664 • fax: 412-765-3738 • e-mail: [boberg@ibacos.com](mailto:boberg@ibacos.com) • [www.ibacos.com](http://www.ibacos.com)

### Industrialized Housing Partnership (IHP)

Subrato Chandra • Florida Solar Energy Center • 1679 Clearlake Road • Cocoa, FL 32922 • 321-638-1412 • fax: 321-638-1439 • e-mail: [subrato@fsec.ucf.edu](mailto:subrato@fsec.ucf.edu) • [www.baihp.org](http://www.baihp.org)

### National Association of Home Builders (NAHB) Research Center

Tom Kenney • National Association of Home Builders (NAHB) Research Center • 400 Prince George's Boulevard • Upper Marlboro, MD 20774 • 301-430-6246 • fax: 301-430-6180 • toll-free: 800-638-8556 • [www.nahbrc.org/](http://www.nahbrc.org/)

### National Renewable Energy Laboratory

Ren Anderson • 1617 Cole Boulevard, MS-2722 • Golden, CO 80401 • 303-384-7433 • fax: 303-384-7540 • e-mail: [ren\\_anderson@nrel.gov](mailto:ren_anderson@nrel.gov) • [www.nrel.gov](http://www.nrel.gov)

Tim Merrigan • 1617 Cole Boulevard, MS-2722 • Golden, CO 80401 • 303-384-7349 • fax: 303-384-7540 • e-mail: [tim\\_merrigan@nrel.gov](mailto:tim_merrigan@nrel.gov) • [www.nrel.gov](http://www.nrel.gov)

### Oak Ridge National Laboratory

Pat M. Love • P.O. Box 2008 • One Bethel Valley Road • Oak Ridge, TN 37831 • 865-574-4346 • fax: 865-574-9331 • e-mail: [lovepm@ornl.gov](mailto:lovepm@ornl.gov) • [www.ornl.gov](http://www.ornl.gov)

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Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable