



GREEN HOMES REPORT

<http://homes-across-america.org/>

HOMES ACROSS AMERICA

comfort • health • performance • durability

October 2002 - September 2003

Introduction

Homes Across America

is a program of the:

Peaks to Prairies
Pollution Prevention
Information Center
Montana State University
Extension Service
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POLLUTION PREVENTION
INFORMATION CENTER

It is supported by
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www.p2rx.org



Homes Across America is a web site created to showcase resource efficient and high performance homes with a vision of bringing resource efficiency into the mainstream of residential construction. **Homes Across America** allows builders, designers, owners and educators to submit case studies for homes:



Built or retrofitted for the residential sales market;



Constructed for research, demonstration, and education.



Home construction is a \$275 billion a year industry in the U.S. Construction and home operation demand a tremendous amount of resources including raw materials, water and energy. These activities also pose a pollution risk to surface water, air quality and produce tons of debris.

Resource efficient homes conserve natural resources, minimize pollution and waste products, provide a healthy environment for the occupant, and reduce costs associated with maintenance, repair and utilities. The quality of these homes is achieved through high performance design, green products and the application of best management practices during construction. New technologies and approaches are rapidly emerging. Interest in resource efficient homes is growing.

HAA is Unique

Homes Across America's goal is to build bridges among existing resources, as well as provide a level of utility not previously available on a national level. Staff at the Peaks to Prairies Pollution Prevention Information Center at Montana State University researched how best to showcase resource efficient homes to assistance providers, designers, builders, and homeowners. Although there are several other web sites where green homes are discussed, people wanted a consistent format for homes throughout the entire country. The HAA format allows site visitors to compare and contrast homes with unique goals, using a variety of resource efficient technologies and construction methods, occurring in various climates and elevations, and built by a variety of sources.



Cartledge House,
Atlanta, Georgia

To qualify for Homes Across America, homes must have been built or remodeled during or after the year 2000. Homes must have a minimum of 25 resource efficient features from seven feature categories to be considered. Each profile must also describe one innovative solution. If a home has outstanding features or innovations, staff may make exceptions to the minimum number of features required.

2003 Trends and Highlights

The **Homes Across America** (HAA) website was officially launched in mid-July, showcasing homes from Washington, D.C., Colorado, Texas, Utah, Oregon, and Montana. Additional profiles were completed from Iowa, Georgia, and another in Montana. Current profiles include a mix from non-profit organizations, professional builders, and private individuals. Features of each home are visually displayed in a photo gallery.

In addition, 44 assistance providers from state, regional, and national housing programs agreed to be listed on the site as local resources for people who want personalized information on green home construction. These contacts also provide leads to possible future homes profiles.

The site runs a full-featured database that allows users to search for home profiles or assistance providers. It also provides for on-line data entry and administration of home profiles. It is a unique offering to the blooming green home building industry by offering a consistent presentation of features and climate information for homes created with different visions and goals.



Homes that are built considering the interactions of major site, design, and resource efficient features, and that use a team approach to optimize resource efficiency, are given the *Integrated Design Award*. Two homes earned this honor during the report period: GreenHOME-2 in Washington, D.C.

and The Gold Dust in Missoula, Montana.

Costs and Markets

The cost of homes ranged from \$64 per square foot to \$150 per square foot. Often the cost was impacted by the owner contributing significantly to the design and construction or, as in the case of some non-profits, educating volunteers by providing them hands-on green construction training. The Iowa Straw Bale House and GreenHOME-2 are two examples. Of the nine homes profiled, four were geared toward a low-income sales market, four were geared toward a middle-income sales market and one was built for a high-income sales market.

Innovations

A unique aspect of **Homes Across America** is its *Innovations* section. Every home is required to detail at least one innovation. An innovation is defined as a solution to a problem or situation that had to be dealt with to accomplish the goal(s) of the house. An innovation is not an “off-the-shelf” fix, but a creative solution to a specific set of circumstances. Feedback suggests the innovations are a distinctive feature of the home profiles.

Innovation:
The Gold Dust affordable housing development received a parking variance from the city allowing the developer to build more units for people without cars.

Innovations not only alert viewers to potential problems but show the creative energy at work in the green home building industry today.

Feature Categories

Although energy efficiency is often cited as the reason why people “build green” and gives an easily calculated return on investment, indoor air quality and green products features are becoming increasingly popular in today’s green homes. More than 20% of reported features in this year’s profiles were related to green products. It should be noted that feature categories are not mutually exclusive: some green product features enhanced energy efficiency as did some site and design features. High reporting in the site and design category shows that people are considering sustainable features with a wholistic approach. Features in categories are not necessarily of the same weight -- time, money, expertise and payback. (e.g. A bank of photovoltaic cells with storage batteries counted as one Energy Efficiency feature and vacuuming out the ductwork after construction counted for one Indoor Air Quality feature.)

In the *Indoor Air Quality* category, mold mitigation and using low volatile organic compound paints and stains were its most prominent features, showing up in over 90% of the profiles.

In the *Green Products* category, efficient windows were the most popular feature. These were installed in every home.

The *Site and Design* category contains features seldom considered in American tract homebuilding of the not so distant past. These specifically relate to window sizing, location, and shading and passive solar design. Green contractors and homeowners now insist home design fit the site and maximize

passive solar gain during cool months and reduce it during warm months. Day lighting is also a sought after feature. The



design of some homes maximizes natural light into interior spaces by things such as atriums, an open floor design, and transcom windows.

Waste Management features deal with the efficient use of materials. Advanced framing, also known as optimum value engineering, was the most cited. This type of framing can substantially reduce the labor and materials costs of a green home and improve its insulative value.

Water efficient appliances and fixtures were the most commonly reported features in the *Water Protection* category. In drier areas, a rainwater collection and reuse system often complimented this. Efforts were also made to reduce stormwater runoff by channeling water to recharge aquifers.

The *Universal Design* category did not receive attention in all homes profiled. Specifically, universal design concepts were a focal point for Utah State University's Utah House, the GreenHome 2 in Washington DC, and the multi-family Gold Dust apartment complex. Each of these projects concentrated on providing amenities to the handicapped and elderly. As most seniors have to leave their homes due to bathroom inaccessibility, improving bathroom utility was the most commonly reported feature in this category.

General Trends

As advocated by building science researchers, a "whole house systems approach" is becoming a prime component of green home building. HAA has confirmed that this is a growing trend as each of its profiles focuses on the systems approach to home design and operation. The largest expenditures related to this combine tight building envelope features with energy efficient heating, ventilation, and cooling systems. Passive heating and cooling techniques are also prominent with the whole house systems approach.

Conversations with building researchers also show that non-profit organizations are currently investing in training builders to build green and to learn how to market their products. The objective is to prove to builders there is a strong and substantial market for green homes, thus increasing the number of green homes built. Many of these non-profits have certified green builder programs, which seek to build trust between builders and homeowners, and assure homeowners of quality, green built homes.



The Irwin House, Stevensville, Montana

Promotion & Marketing

Marketing materials were developed including a full-color postcard, business cards, a brochure insert, and a poster for conference displays. News releases were sent to newspapers throughout the country, and the site was promoted electronically to professional contacts nationwide.

Homes Across America was presented at a Green Building Design and Practices web conference in March. About 35 people from EPA's Regions I and II participated.

The program was also featured in a display developed to promote Peaks to Prairies at the Montana Biennial Trails Conference in Butte, Montana. In addition, a PowerPoint presentation



was given to contractors and designers at the Big Sky Greening Conference in June. The PowerPoint Presentation is easily adapted to new information and different audiences. The site was also promoted among members of the Pollution Prevention Resource Exchange network, and was selected by both the Department of Energy's Smart Communities Network and the Great Lakes Regional Pollution Prevention Roundtable as their website of the month in August 2003. All assistance providers listed on the Homes Across America website received a supply of post cards to promote green home building.

Goals For The Coming Year

- **Hone the submission process** - The biggest challenge has been to publish home profiles in a timely manner. Sections of the on-line submission form will be reorganized to make it easier to supply basic information up front.
- **More cross-referencing to other green residential construction resources** - This includes links to state-of-the-art products, construction techniques, and information sources.
- **Glossary of industry terms** - Many profiles uses comparable products and techniques. A glossary will be created to avoid unnecessary redundancy.
- **Participant acknowledgement** - Develop a way to acknowledge homes for being accepted into *Homes Across America*, with a special note to

Homes Across America opens the “front door” to resource efficient and high performance home building in the United States. Visitors can:

- √ search for homes and find out about the “green” technology used to build them
- √ find builders and designers who have created resource efficient homes
- √ study climate factors relevant to home designs in different areas
- √ find local, non-biased technical assistance for building green
- √ track trends and innovations in the residential market over time

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We built *Homes Across America* for you; you build it too!

If you know of resource efficient homes and agencies that provide technical assistance in your state, please tell us. We will contact them and invite them to be part of the showcase.

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Homes Across America is a national project of the P2Rx network of pollution prevention information centers, created and managed by the Peaks to Prairies Center. Peaks to Prairies is operated by the Montana State University Extension Service and serves EPA Region 8 states - North Dakota, South Dakota, Montana, Wyoming, Colorado, and Utah.

As part of a non-regulatory, educational entity, Peaks to Prairies draws on resources of the land-grant system. The Center’s goal is to protect the environment through pollution prevention. Its major function is to serve as a networking tool for federal, state and local government agencies, trade associations, educational institutions, consultants, and non-governmental organizations that serve consumers and businesses.

Selection Criteria:

You may submit a home profile on-line or print out a hard copy of the application and fax or mail it. ***Homes Across America*** will consider homes completed during or after the year 2000 that showcase resource efficient technologies. To be selected, homes must:

- Describe at least one feature in both the *Site and Design* and *Energy Efficiency* categories
- Describe a minimum of 15 features in a combination of categories
- Describe at least one Innovation (in-depth review of a feature that was customized as a solution for this home.)

In addition to the above, ***Homes Across America*** will select profiles based on the variety of features presented, how features address unique climate and site considerations, and evidence of how resources are being conserved. For homes that are selected, a good contact person must be available with whom HAA staff can finalize the profile. Climate information for the home’s specific locale will be added by Homes Across America staff with reference to government weather sources.

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