

# ENERGY STAR<sup>®</sup> Homes and Green Building Programs: Can We Have a Successful Partnership?

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## ABSTRACT

Concerns about global warming as well as rising energy prices have led to a proliferation of “green building” initiatives and programs aimed at the market for residential new construction. Green building may encompass energy efficiency, the use of renewable energy sources, water efficiency, site selection to minimize the use of undeveloped land, locating near public transportation to minimize car use, smaller or “right-sized” homes, and use of renewable or recycled materials. Since energy efficiency is one part of green building, some programs will overlap with local ENERGY STAR Homes programs and target the same builders. The 2006 evaluation of the Massachusetts ENERGY STAR Homes Program, for the first time, specifically addressed the relationship between ENERGY STAR Homes program participation and green building through interviews with 40 builders and eight multifamily project developers and a telephone survey of 200 new home buyers.

Finally, the evaluation also explored opportunities for interaction between ENERGY STAR Homes and green building programs through interviews with ten ENERGY STAR Homes program sponsors across the country recounting successes in working together, an example being co-sponsorship of the LEED for Homes pilot. Some also noted pitfalls in partnerships, such as an ENERGY STAR sponsor speaking of “green washing”—that is, green building programs claiming energy savings and better indoor environments in the absence of verification of air tightness and ventilation requirements.

The research conducted has led to the conclusion that the popularity of green building presents a unique opportunity for ENERGY STAR Homes Programs to work with green building programs to ensure that energy efficiency, specifically ENERGY STAR standards, become prerequisites for building green.

## Introduction

Concerns about global warming and other environmental issues as well as rising energy prices have led to a proliferation of green building programs. While ENERGY STAR Homes Programs have focused on the energy efficiency of individual newly constructed homes, green building encompasses a broader environmental perspective than the energy efficiency of individual buildings and applies to additions and renovations as well as newly constructed homes. In addition to energy efficiency, green building may include water efficiency, use of renewable electric energy generation, site selection to minimize use of undeveloped land, locating near public transportation to minimize car use, smaller or “right-sized” homes, and use of recycled materials.<sup>1</sup>

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<sup>1</sup> Adapted from US Green Building Council, “Rating System for Pilot Demonstration of LEED for Homes Program.” LEED ratings are currently available for multifamily buildings with over three stories and are being piloted for single family homes.

While the term “green building” has become increasingly popular in both the trade and popular media with a number of organizations dedicated to its promotion, various programs have inconsistencies in awarding various numbers of points for different attributes and having different levels a home may achieve. ENERGY STAR Homes programs, in contrast, offer standardized testing and verification of efficiency for newly constructed homes that receive certification. The ENERGY STAR label implies a particular standard, above code, has been met; builders with homes that are much more energy efficient than signified by the label may also publicize the ratings of their homes on the HERS index.

Since ENERGY STAR Homes and green building programs often target the same builders, the 2006 evaluation of the Massachusetts ENERGY STAR Homes Program, for the first time, specifically addressed the relationship between ENERGY STAR Homes program participation and green building, and looked for synergies and possible cooperation strategies among programs. The evaluation gathered inputs on green building from four different groups: builders, multifamily developers, recent buyers of newly constructed homes, and ENERGY STAR Homes program sponsors in different parts of the country.

## **Builders**

The 2006 evaluation of the Massachusetts ENERGY STAR Homes program interviewed 40 builders, including 24 who had signed up to build ENERGY STAR homes and 16 who had not signed up with the program. The great majority of builders interviewed (23 out of 24 ENERGY STAR builders and 13 out of 16 non-ENERGY STAR builders) claim to have some familiarity with green building. Builders who had not signed up with the program had a similar rate of awareness of the ENERGY STAR Homes Program; 13 of 16 say they are at least somewhat familiar with it. The most common definition of green building provided by builders is the use of renewable or recycled materials in construction. Energy efficiency is mentioned less than half as often as renewable materials. The use of solar or renewable sources of power is mentioned slightly less often than energy efficiency. (Table 1)

**Table 1**  
**Meaning of the Term “Green Building” for Builders**

(Respondents who say they have some familiarity with the term “green building”; number of responses; multiple response)

	ENERGY STAR Builders	Other Builders	Total
n	23	13	36
Use of recycled, renewable, or sustainable materials such as bamboo	19	7	26
Use of renewable energy sources; solar panels, wind power	7	3	10
Energy efficiency; better insulation; high performance heating system	9	5	14
Water conservation; recapture water; innovative sewage treatment	3	0	3
Indoor air quality; no carpets and low volatile organic component (VOC) materials	8	0	8
Recycle construction waste	6	0	6
More expensive	1	0	1
Complex rating system	1	1	2
LEED home	1	0	1
Not clear as much land	1	0	1
Organic lawn care	1	0	1
Don't know	1	1	2

Eighteen of the 24 ENERGY STAR builders and three of the 16 non-ENERGY STAR builders interviewed have heard of Leadership in Energy and Environmental Design (LEED) homes.<sup>2</sup> Two of the ENERGY STAR builders interviewed were in the process of building LEED homes. Many others builders say they would be “interested” (14 out of 40) or “somewhat interested” (10 out of 40) in incorporating green building practices in their homes; a few (3 out of 40) would be “extremely interested” or “not at all interested” (6 out of 40); the remainder (5 out of 40) say they don't know.

### **Multifamily Developers**

Eight multifamily project developers and other decision makers were interviewed as part of the 2006 evaluation; five had completed buildings that were ENERGY STAR certified and three had not. The interviewees were asked to rate their familiarity with green building on a scale of one to five where one is “not at all informed” and five is “very informed”. Not surprisingly, those with ENERGY STAR certified buildings consider themselves much more familiar with green building (mean rating of 4.2)

<sup>2</sup> At the time of the interviews, LEED ratings for homes were being piloted in several states, including Massachusetts. Many ENERGY STAR builders were told of the pilot by the Program implementer who was also running the LEED pilot in Massachusetts.

than those without ENERGY STAR buildings (mean rating of 3.3). Multifamily developers are more likely than builders to include energy efficiency in their understanding of green building. (Table 2)

**Table 2**  
**Meaning of the Term “Green Building” for Multifamily Developers**  
 (Number of Responses; multiple response)

n	8
Energy-efficient	4
Uses recycled materials	3
Try to minimize the impact of building on the environment	2
Durable	2
Use renewable energy sources	1
Use brownfields rather than greenfields	1
Healthier building	1
Better water usage; reuse water for landscaping	1
Cut down as few trees as possible	1
Harmonious with nature	1
LEED certified	1

The barrier to building green most often mentioned by multifamily developers, not surprisingly, is cost. Lack of education on the part of developers, builders, and architects is also considered a significant barrier. (Table 3)

**Table 3**  
**Barriers to Green Building for Multifamily Developers**  
 (Number of Responses; multiple response)

n	8
Cost	4
Lack of education	3
Lack of significant incentives	2
Resistance to change by builders	2
Scarcity of good, durable, recycled materials	1
Reluctance by builders to take on additional monitoring	1
Hard to do solar for income-qualified housing due to threat of vandalism	1

## Home Buyers

The 2006 Massachusetts evaluation included a telephone survey of 200 households that had recently bought newly constructed homes: 100 had bought ENERGY STAR certified homes and 100 had bought homes that are not certified.<sup>3</sup> Survey respondents were asked how familiar, if at all, they are with the term green building. The survey also asked if they had seen or heard of an ENERGY STAR label being applied to a newly constructed home. About one-half of the home buyers surveyed had

<sup>3</sup> The sample was developed from utility lists of recent service requests. The addresses were checked against the ENERGY STAR program database to exclude those with ENERGY STAR homes from the sample of non-ENERGY STAR home buyers; however, a small number could have bought homes certified before or after the time period considered.

some familiarity with the term “green building.” It is important to note that recent home buyers of non-ENERGY STAR homes as well as the home buyer population as a whole<sup>4</sup> are far more likely to claim some familiarity with the term green building than to be aware of the ENERGY STAR label on newly constructed homes. Interestingly, ENERGY STAR home buyers are slightly less familiar than other home buyers with green building, although the differences are not statistically significant. Their lower awareness is likely due to demographic and housing differences. Respondents with higher incomes (\$75,000 or more) and owners of single, detached homes are more likely to be familiar with green building than those with incomes under \$75,000 and owners of homes in multifamily buildings; ENERGY STAR home buyers in Massachusetts have slightly lower incomes and are more likely to purchase units in multifamily buildings. This is due to the Program’s focus, to date, on large builders of multi-unit projects. (Table 4)

**Table 4**  
**Familiarity with the Term “Green Building” and ENERGY STAR Homes for Home Buyers**

	ENERGY STAR Homes	Other Homes	Total
N	100	100	200
<b>Familiarity with green building</b>			
Very familiar	17%	15%	16%
Somewhat familiar	20%	30%	29%
A little bit familiar	10%	7%	7%
Never heard of the term	53%	48%	48%
<b>Aware of ENERGY STAR label on newly constructed homes</b>	59%	33% <sup>√</sup>	36%

<sup>√</sup> Significantly different from ENERGY STAR homes buyers at the 90% confidence level.

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<sup>4</sup> Results for the home buyer population as a whole (“Total” in Table 4) are estimated by weighting the responses of ENERGY STAR and non-ENERGY STAR home buyers by the percentage of ENERGY STAR homes in the population of newly constructed homes; in 2005 approximately 11% of new homes in Massachusetts were ENERGY STAR certified.

It should be noted, however, that when home buyers are asked to rate the importance of various factors in their decision to purchase a particular home, getting a more efficient home with lower energy bills is rated far higher than green building. (Table 5)

**Table 5**  
**Factors in Decision to Buy/Build This Home Rather than Another**

(all home buyers;

0= “one of the least important factors,” 10= “one of the most important factors”)

	ENERGY STAR Homes		Other Homes		Total	
	n	Mean	n	Mean	n	Total
Quality of construction	98	9.1	95	8.7	193	8.8
Getting a more efficient home with lower energy bills	93	9.2	92	8.6	185	8.7
More or better insulation	93	8.6	90	8.7	183	8.7
Being involved in decisions about features of the home	88	8.6	88	8.6	176	8.6
More efficient windows or windows with a low e value	94	8.8	93	8.6	187	8.6
Room layout or design	96	8.7	91	8.5	173	8.5
Healthier indoor air	93	8.4	89	8.2	182	8.2
Builder reputation	86	8.6	87	8.1	173	8.2
Size of the home	96	8.4	93	8.0	189	8.1
Keeping down the overall purchase price of the home	97	8.1	95	8.0	192	8.0
Community amenities (e.g., bike trails, community pool, recreation center, access to public transportation)						7.5
Good schools	78	3.6	97	5.2	175	7.0
Commuting distance or time to work	47	6.8	69	7.0	116	7.0
Use of green building	52	7.7	45	6.3	97	6.5
Lack of availability of other suitable homes	67	5.3	71	6.0	138	5.9

Asked what green building means to them, most home buyers, in contrast to builders, mention energy efficiency more often than other factors. This may be partly due to the fact that, at this point in the survey, the respondents had a good idea that energy efficiency was the topic of interest. It may also be reflect the greater importance placed on energy efficiency than other aspects of green building. Respondents also mention the use of recycled or sustainable materials and the use of renewable energy. (Table 6)

**Table 6**  
**Meaning of the Term “Green Building” for Home Buyers**

(Respondents who say they have some familiarity with the term ‘green building’; multiple response)

	ENERGY STAR Homes	Other Homes	Total
n	47	52	99
Energy efficiency	53%	77% <sup>∨</sup>	75%
Use of recycled, renewable, or sustainable materials such as bamboo	30%	19%	20%
Use of renewable energy such as solar or wind power	15%	10%	10%
Well insulated home	4%	8%	7%
Healthy or clean indoor environment	9%	6%	6%
Environmentally friendly	6%	6%	6%
Higher quality	4%	4%	4%
Home built on reclaimed or already used land	0%	4%	3%
Water conservation or recapturing wastewater	0%	4%	3%
More expensive	0%	4%	3%
ENERGY STAR homes	2%	2%	2%
Smaller sized homes	2%	2%	2%
Don’t know	11%	8%	8%

<sup>∨</sup>Significantly different from ENERGY STAR homes buyers at the 90% confidence level.

Finally, when asked to rate how “green” their new home is on a scale from 0 to 10, where 0 is “not green at all” and 10 is “very high on a green building scale,” ENERGY STAR home buyers give their homes significantly higher ratings than non-ENERGY STAR home buyers. (Table 7) This is an encouraging sign that many ENERGY STAR home buyers are aware of the fact that their homes are built to exceed code in energy efficiency and associate them with green building.

**Table 7**  
**How Green Do You Consider Your New Home To Be?**  
 (Respondents who say they have some familiarity with the term ‘green building’;  
 0 = “not green at all” and 10 = “very high on a green building scale”)

	ENERGY STAR Homes	Other Homes	Total
n	47	52	99
0-3 rating	0%	8% <sup>v</sup>	7%
4-7 rating	45%	69% <sup>v</sup>	68%
8-10 rating	47%	19% <sup>v</sup>	23%
Don’t know	8%	4%	2%
Mean rating	7.3	6.0 <sup>v</sup>	6.1

<sup>v</sup>Significantly different from ENERGY STAR homes buyers at the 90% confidence level.

## ENERGY STAR Homes Programs in Different Areas

The 2006 Massachusetts evaluation included interviews with representatives of ENERGY STAR Homes programs in California, the Pacific Northwest, Texas, Iowa, Wisconsin, New York, New Jersey, Vermont, and Connecticut, conducted over the summer of 2006. Programs in different areas have had different experiences working with local green building efforts. Vermont, New Jersey, and Massachusetts all participated in the LEED for Homes Pilot, in some cases with the same organization implementing both programs and coordinating the certification process. Homes receiving LEED certification need to meet ENERGY STAR standards; in fact, LEED for Homes is designed to complement ENERGY STAR Homes requirements by adding components addressing water efficiency, the use of sustainable materials, and minimizing construction waste. LEED for Homes is also designed so that the same raters can deliver ENERGY STAR and LEED services, minimizing disruptions for builders.

Four other ENERGY STAR Homes Programs report generally positive experiences working with local green building programs. A key focus is to persuade these programs to incorporate ENERGY STAR certification as a prerequisite to participation in a green building program. ENERGY STAR Homes Programs have also sponsored mutual events and co-promotions working with green building programs to have them promote ENERGY STAR Homes in their messaging.

Representatives of one of the ENERGY STAR Homes Programs interviewed are, however, frustrated in their dealings with green building programs. They claim that a green building program “stole” one of their largest builders. They also cite “green washing”—that is, green building programs claiming energy savings and better indoor environments through the use of green products but with no testing and verification of air tightness and ventilation requirements.



## Conclusions

Until recently, the Massachusetts ENERGY STAR Homes Program has had little to do with green building programs. This is understandable given that the program's cost-effectiveness depends on the energy saved; it makes little sense to use up funds in areas where the sponsors get no credit. However, across the country, ENERGY STAR Homes Programs are operating in an environment where green building initiatives are proliferating. The BuildingEnergy07 Conference held in Boston in mid-March 2007, which covered different aspects of green building, had 164 exhibitors, over 190 speakers, and over 1500 registered participants, mostly from New England. Similar events draw crowds elsewhere as well. But green building is popular not only among the trade professionals likely to attend these events. Our most recent research found that, among the population of households that had recently purchased a newly constructed home in Massachusetts, a far higher percentage considered themselves somewhat or very familiar with green building than were aware of the ENERGY STAR label on new homes. However, home buyers rated getting a more efficient home with lower energy bills far higher than green building as a decision factor in their home purchase.

ENERGY STAR Homes Programs offer a single, third-party verified standard of energy efficiency in residential new construction, while (under the Performance Path) also providing a Home Energy Rating System (HERS) index as a measure of a home's energy efficiency. While some green building initiatives, such as the LEED for Homes Pilot, also have well-defined requirements, initiatives designed to appeal to more "mainstream" builders may well have looser guidelines that vary considerably among initiatives in different areas. In our view, ENERGY STAR Homes Programs, at this stage, have a unique opportunity to work with green building programs to ensure that energy efficiency, including proper sealing and ventilation, remain prerequisites for building green. Incorporating ENERGY STAR standards is a step toward consistent energy-efficiency requirements for green building, which would also raise awareness of ENERGY STAR Homes among potential home buyers and provide much needed marketing for ENERGY STAR certification.

Green building programs have much to gain by working with ENERGY STAR Homes Programs as well. Emphasizing energy efficiency and the resulting savings on energy bills will attract larger numbers of consumers and builders that will allow these programs to become more of a mainstream factor in new home construction.

It is important to remember that while more home buyers are familiar with green building than with ENERGY STAR Homes, the vast majority also consider energy efficiency to be part of the former. It's time to make sure that is indeed the case.

## References

National Association of Home Builders website. 2007. [www.nahb.org](http://www.nahb.org).

Northeast Sustainable Energy Association, BuildingEnergy07 Conference website. 2007. <http://buildingenergy.nesea.org>

U.S. Green Building Council website. 2007. [www.usgbc.org](http://www.usgbc.org).