

Green Single Family and Multifamily Homes 2020



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Introduction

ABOUT THIS SMARTMARKET BRIEF

The findings reported in this Brief mark the launch of a new approach to broaden the reach and relevance of this study and create more meaningful benchmarks for understanding the prevalence of green building activity in the residential marketplace. Four short surveys on the main topics included in this Brief—market activity, marketing, drivers and obstacles, and products and practices—were sent out to encourage a wider response and better reveal the degree of green activity among home builders. Due to this approach, 1,163 unique respondents completed a total of 2,000 of these surveys.

The following definition of green building was presented in each survey:

A green home incorporates strategies in design and construction that increase energy, water and resource efficiency, indoor environmental quality and minimize environmental impacts on the site; and/or is certified by a third-party to the National Green Building Standard, LEED for Homes or any other green rating system.

The new study presents a portrait of green activity, evolving trends in the marketplace, and factors that can increase engagement with green by single family and multifamily builders and remodelers.

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COVER IMAGE

The home on the cover was built in North Asheville, NC by local builder Red Tree Builders, Inc. and is situated in the Agrihood community of Olivette. The company uses local artisans to source some materials like custom light fixtures and iron work for stair railings. Using geothermal energy, mechanical ventilation, a whole-house humidifier and a hybrid hot water heater, Red Tree Builders was able to create a home that emphasizes efficiency and comfort. The home earned a HERS 46 and a green certification from a state program.

Cover Image: Olivette Home built by Red Tree Builders, Inc.
Photo by Tim Burlison

Green Building Market Activity

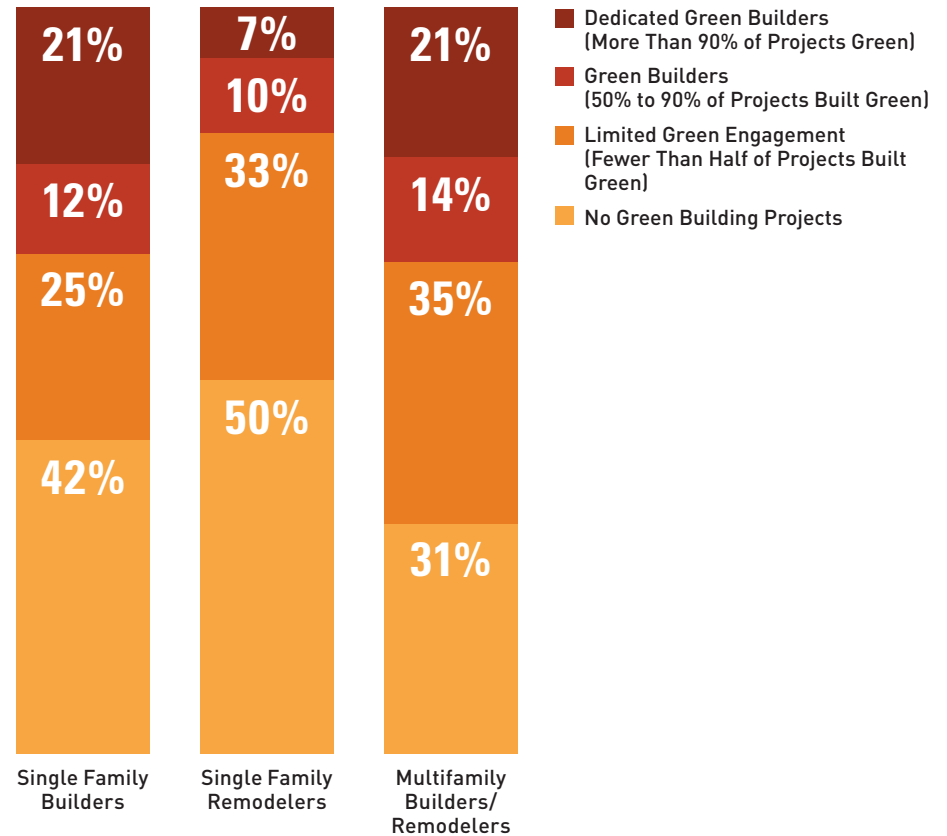
LEVEL OF GREEN BUILDING INVOLVEMENT BY HOME BUILDERS AND REMODELERS

The data in this report comes from four surveys on green building that were conducted with builders and remodelers. In each survey, they were asked to provide the percentage of their green projects in 2018, based on the following definition: *A green home incorporates strategies in design and construction that increase energy, water and resource efficiency, indoor environmental quality, and minimize environmental impacts on the site; and/or is certified by a third-party to the National Green Building Standard, LEED for Homes or any other green rating system.*

The chart at right shows the range of responses averaged across the four surveys, from those doing no green building to those with limited green engagement (fewer than 50% of projects are green) to green builders/remodelers (50% to 90% green projects) to those primarily dedicated to green building (more than 90% of projects are green).

- One third or more of single family builders (33%) and multifamily builders/remodelers (35%) report doing 50% or more of their projects green.
- 42% of single family builders and 31% of multifamily builders/remodelers report doing no green building at all by the definition above.
- The combination of the previous two findings demonstrate that while there is engagement with green currently in new residential construction, there is also still a notable opportunity to increase future engagement.
- Only 17% of single family remodelers do more than half of their projects green, and 50% of remodelers did not do any green projects in 2018. This low engagement may be in part due to the restrictions of the definition, which may require green activities beyond the scope of some renovation projects.

Percentage of Green Projects (Average Across Four Surveys)



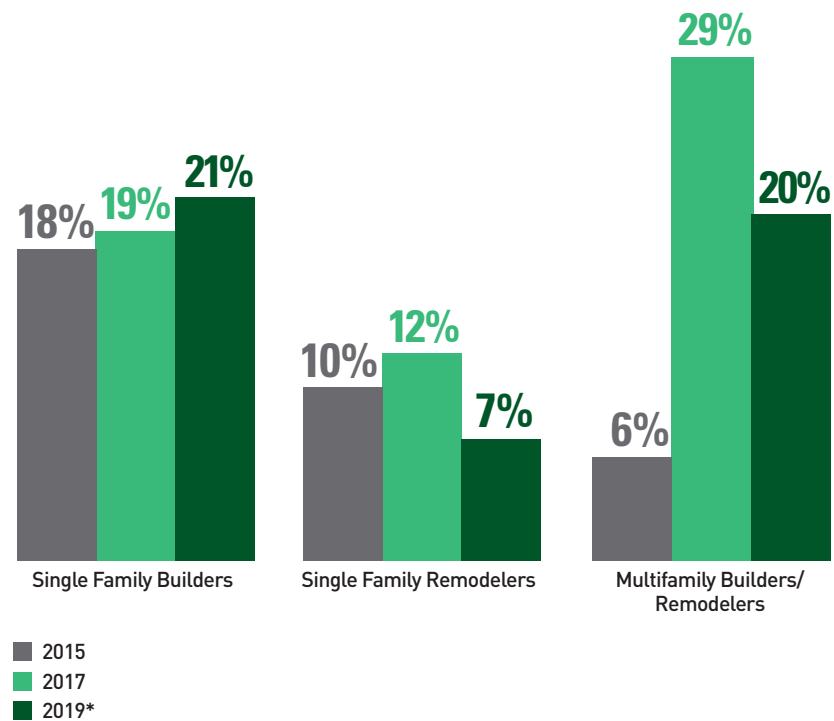
Green Building Market Activity

CHANGE IN PERCENTAGE OF DEDICATED GREEN BUILDERS

The chart at right represents the percentage of builders and remodelers who report that their work is nearly exclusively green (over 90% of projects). The chart reveals very different responses among single family builders, single family remodelers, and multifamily builders and remodelers. Note that the definition used in the 2019 surveys was more rigorous than the one used in the previous surveys since it focuses on the results achieved, requiring that homes have increased energy, water and resource efficiency and improved indoor air quality, rather than simply requiring that practices associated with improved performance were used.

- The percentage of dedicated green single family home builders has steadily grown from 18% in 2014 to 21% in 2019.
- The stricter definition may prevent some remodeling projects from being called green because of its emphasis on improved performance in all required areas. This is probably why the percentage dropped to just 7% from 12% in 2017.
- Because the sample of multifamily builders/remodelers was small in both 2017 and 2019, the 9 point drop in 2019 is less meaningful than it would be with a larger pool of respondents. In addition, in 2017, only multifamily builders were included in the analysis, but in 2019, remodelers were included along with the builders. Since builders generally do a higher percentage of green building than remodelers, the addition of remodelers to the analysis in 2019 could also have contributed to the decline in dedicated multifamily green firms reported in 2019.

Percentage of Dedicated Green Builders (Doing 90% of Their Projects Green)



*More rigorous definition of green building provided

Green Building Market Activity

TOP REASON FOR BUILDING GREEN

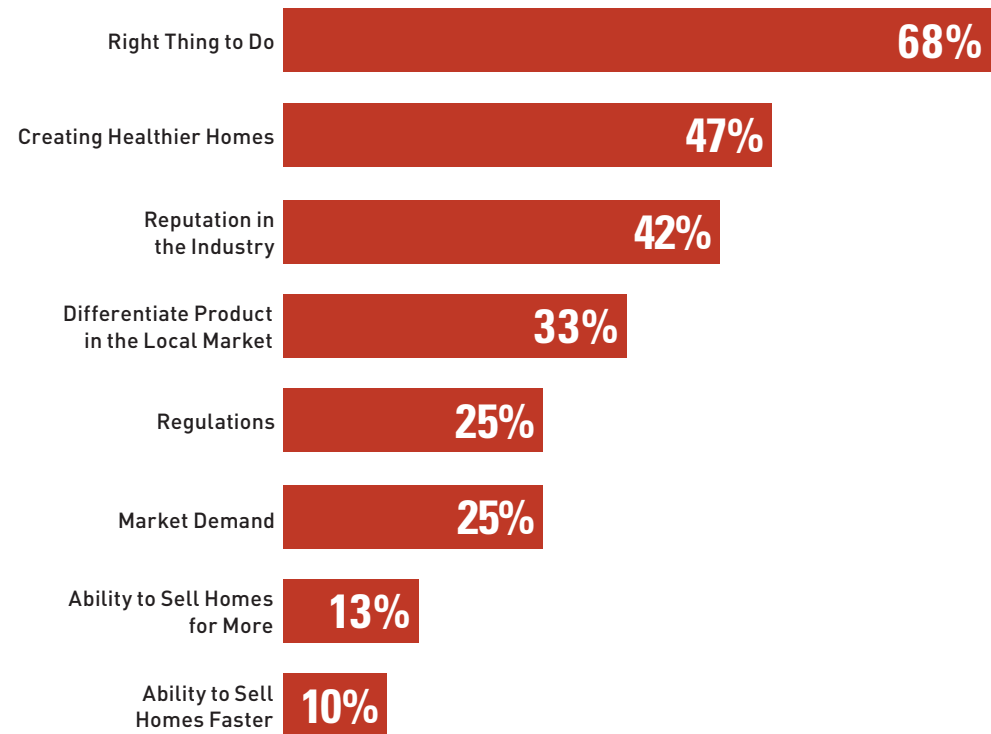
Green builders (all those doing 50% or more of their projects green) were asked about the top reasons they built green homes in the past year. The chart at right represents the responses from this group of home builders.

Unlike findings from Dodge studies on commercial green construction, where cost savings and other business factors are the most important drivers, the highest percentage of green single family home builders (68%) say that they choose to build green homes because it is the right thing to do. Also highly influential is the desire to create healthier buildings and to improve their reputation in the industry.

Very few home builders, on the other hand, are influenced by regulations or market factors in their decision to build green. The low number of those influenced by market demand indicates a potential opportunity to better understand how to respond to what consumers want.

Top Reasons Single Family Home Builders Build Green

According to Builders Doing 50% or More Homes Green



Green Building Market Activity

TOP REASONS FOR NOT BUILDING GREEN

When single family builders and remodelers were asked to select their top reasons for not doing more green building, over three quarters cited the lack of customer demand. For home builders, cost is also a major factor, far more than it is for remodelers.

VARIATION BY REGION AND SIZE AMONG SINGLE FAMILY BUILDERS

More single family home builders in the Northeast (81%) consider the expense of building a green home a top obstacle that prevents them from undertaking more green building than those in the other three regions, where this is a top issue for only half or fewer. There is no significant regional variation, though, in the percentage who select lack of customer demand among their top reasons.

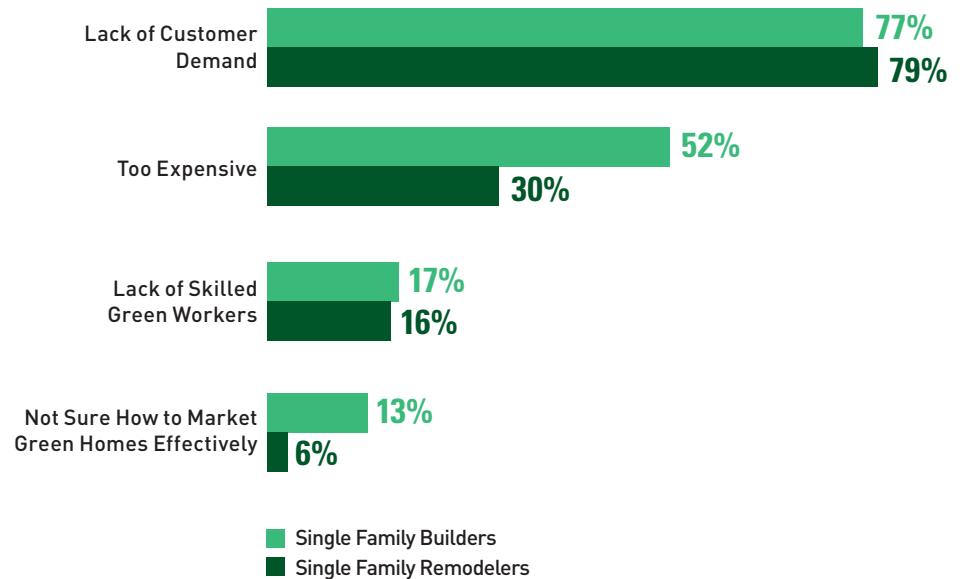
Interestingly, the issue of the cost of green building also weighs more heavily on midsize (64%) and large builders (76%) than it does on small builders (42%).¹

No meaningful variations are reported among single family remodelers.

¹ Number of units constructed annually is the measure for size of home builder company in this analysis: small 1 to 9 units, midsize 10 to 50 units and large more than 50 units

Reasons That Companies Have Not Done More Green Building

According to Builders and Remodelers Doing Fewer Than Half of Their Projects Green



Green Building Market Activity

GREEN ACTIVITIES SINGLE FAMILY BUILDERS

Single family builders were asked to what extent they used the green practices shown to the right. The chart shows those who used them on any of their projects, and those who report using them on most (75% or more) projects.

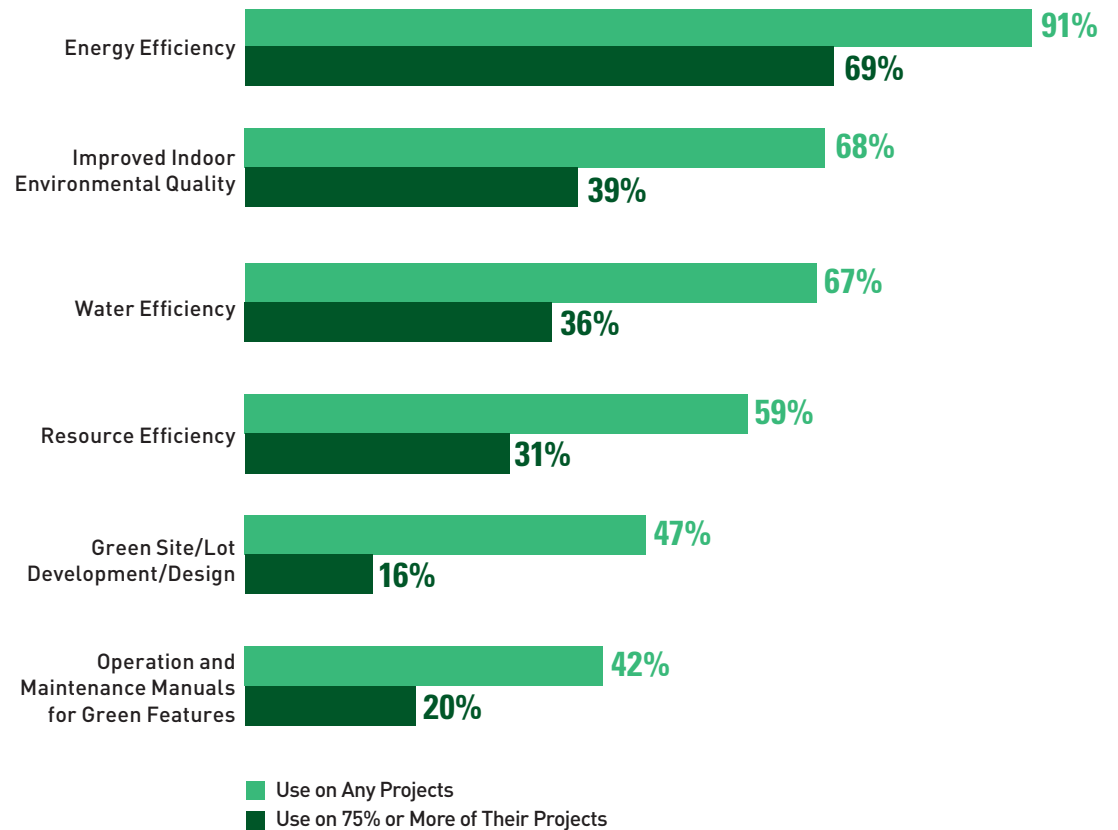
Nearly all (91%) use energy efficiency practices on at least some of the homes they build, and over two thirds (69%) use them on most projects. This finding demonstrates that energy efficiency is a common practice that is not only confined to green projects.

Practices that improve indoor environmental quality and water efficiency are used by over two thirds of builders, but only about one third do so on most of their projects.

Fewer than half engage in green site development (which was described in the survey as green site design and development, and lot design, preparation and development) or provide operation and maintenance manuals for green features. The low use of green site development is consistent with the interest in improving performance associated with the building rather than the site that is evident in the water efficiency findings noted on page 9.

There are no significant differences by region for any of these activities.

Use of Green Activities by All Single Family Home Builders



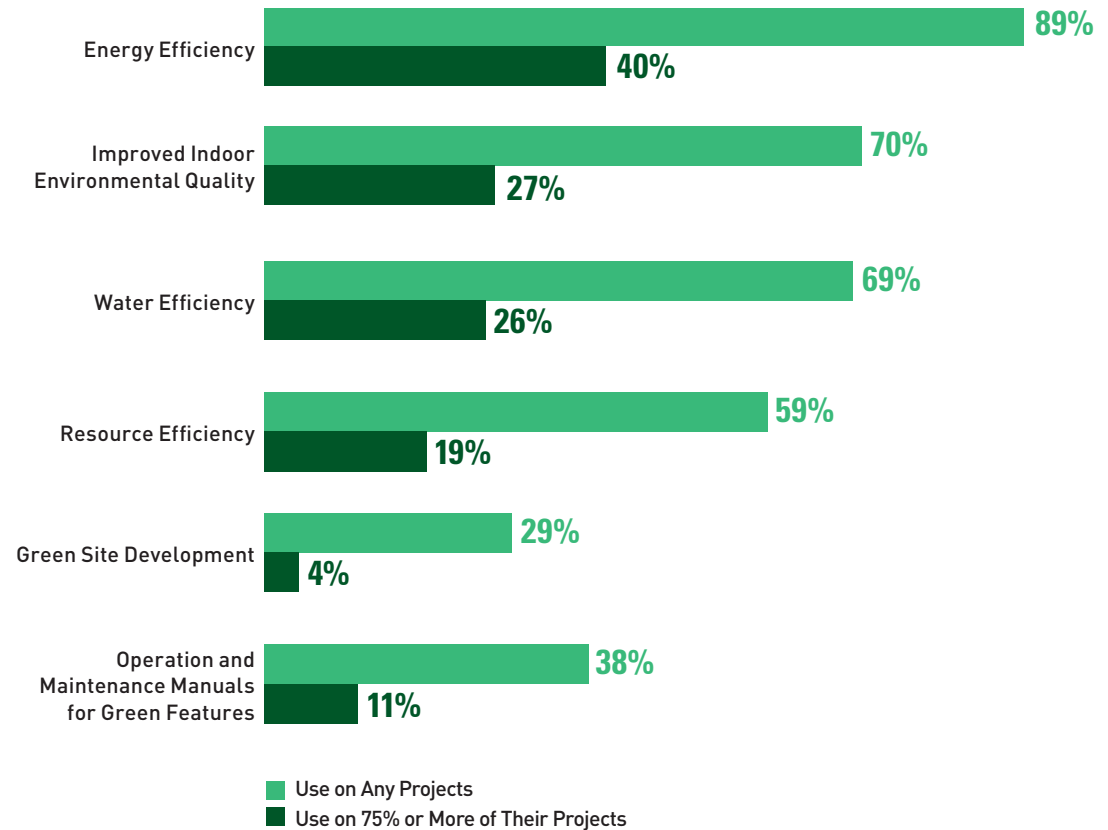
Green Building Market Activity

GREEN ACTIVITIES SINGLE FAMILY REMODELERS

Single family remodelers were asked about the same six practices, and the relative ranking of use of practices on any projects is the same between home builders (previous page) and home remodelers (chart at right). However, there are also notable differences between single family builders and remodelers:

- More than half of remodelers use energy efficiency, improved indoor environmental quality, water efficiency and resource efficiency practices on at least some of their projects, but fewer than half of remodelers use any of these practices on 75% or more of their projects.
- Client priorities could be a major factor in the difference in use of green practices reported by remodelers compared with home builders, since remodeling project priorities are guided by the client.
- The data shows that remodelers have not yet adopted these green practices to the extent seen among builders. This is consistent with findings from previous green residential studies conducted by Dodge.

Use of Green Activities by All Single Family Home Remodelers



Green Building Market Activity

TOP GREEN HOME PERFORMANCE OBJECTIVES FOR GREEN HOME BUILDERS

Green builders (those doing more than 50% of their projects green) were asked about the top practices they use to improve green home performance. The chart at right represents the responses from green home builders only.

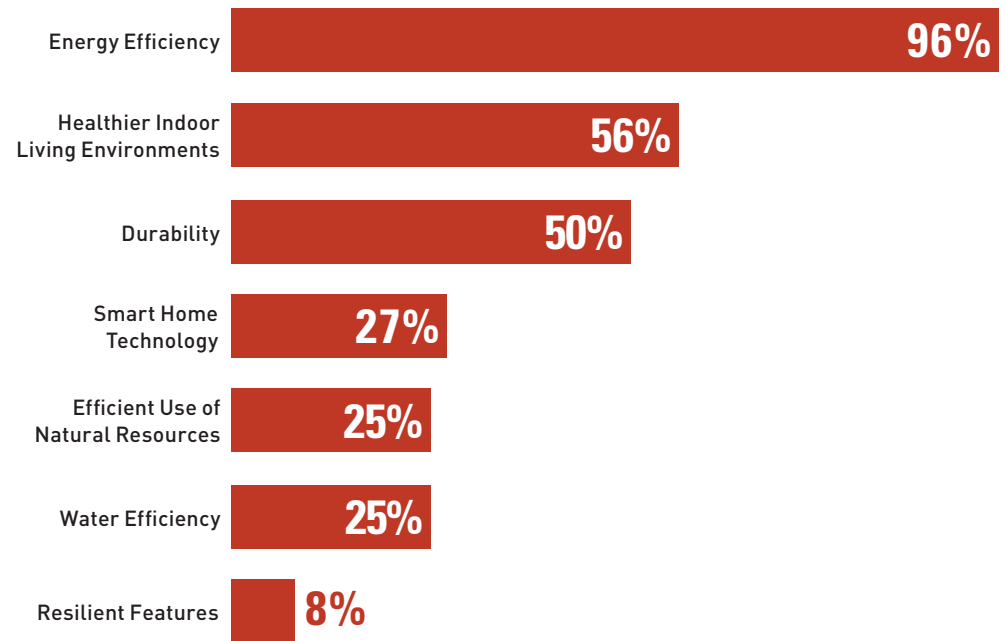
Energy efficiency is by far the top practice that is expected to improve green home performance, selected by nearly all of the green home builders. About half of green home builders also regard healthier indoor living environments and durability as top ways to improve performance.

Only about one quarter consider smart home technology, efficient use of natural resources or water efficiency one of the top practices to improve green home performance. The low number of respondents who reported using practices to improve water efficiency is particularly surprising since water efficiency practices are used almost as often as techniques to improve indoor environmental quality (see page 6), despite the gap here in how they are perceived to influence home performance.

No significant differences were noted regionally for any of these responses.

Top Practices to Improve Green Home Performance

According to Home Builders Doing More Than 50% Green Homes



Green Building Market Activity

MOST WIDELY USED GREEN BUILDING PRACTICES BY GREEN HOME BUILDERS

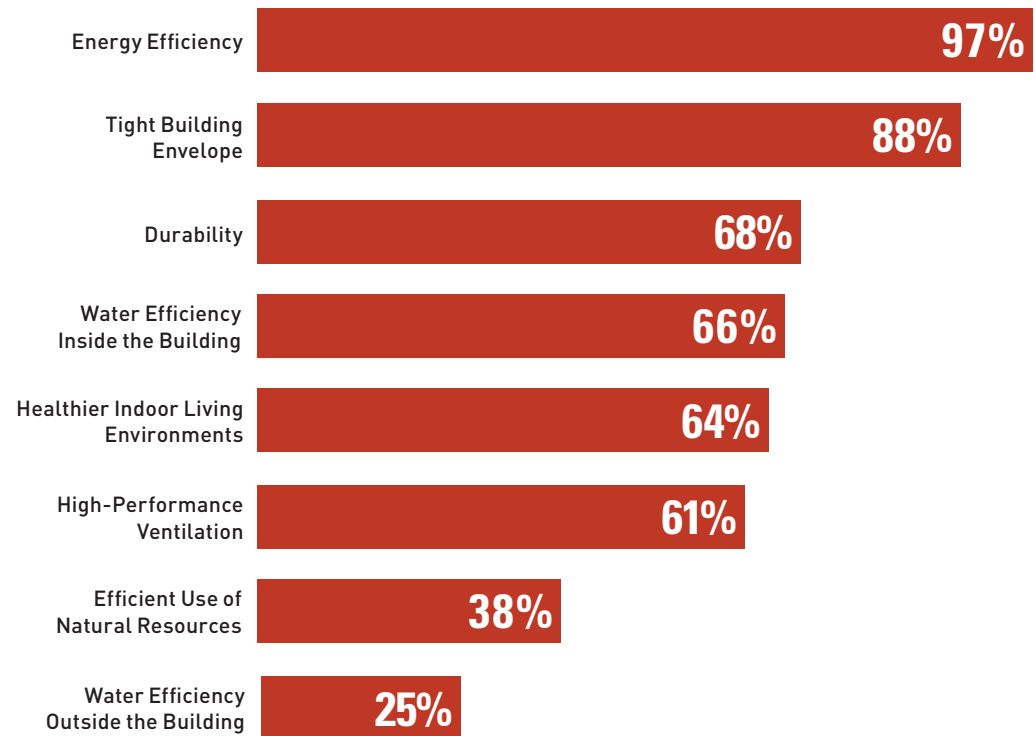
In order to better understand the use of specific green building practices, green home builders were asked which practices they use on 75% or more of their projects, while builders and remodelers with lower green engagement were asked about the green practices they use on 50% or more projects. The chart at right shows the practices most widely used by green home builders on the majority of their projects.

Nearly all green home builders (97%) use energy efficiency practices on most of their projects, and most employ a tight building envelope (88%). Having a tighter envelope is a common practice that contributes to energy performance, which corresponds with the importance placed on energy efficiency for improving a home's performance (see page 8).

About two thirds of green home builders use four other practices on more than 75% of their home building projects, as shown in the chart at right. The attention to durability, healthier indoor environments and high-performance ventilation corresponds to findings on page 8 about practices that best improve home performance. However, the rate at which indoor water-efficient practices are used is much higher than builders' perception of the impact they have on home performance. Practices to improve water efficiency outside the building, though, are not widely used.

Use of Green Practices on More Than 75% of Home Projects

According to Home Builders Doing More Than 50% of Their Projects Green



Green Building Market Activity

MOST WIDELY USED GREEN PRACTICES BY HOME BUILDERS AND REMODELERS WITH LOWER GREEN ENGAGEMENT

While green single family home builders and remodelers were asked which practices they use on 75% or more of their projects, those with a lower level of engagement in green were asked about what practices they use on at least 50% of projects.

Similar to the green builders, those less engaged with green frequently use practices that improve energy efficiency, tighten the building envelope and improve durability.

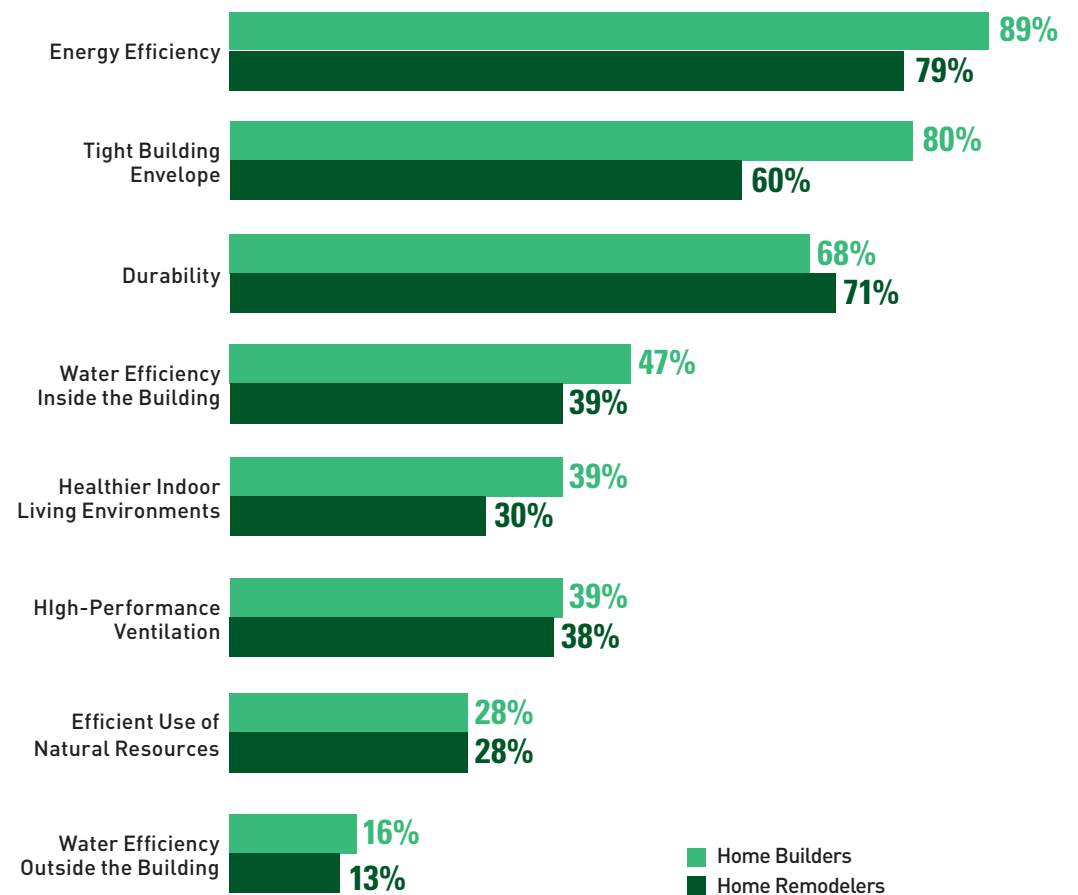
Builders with less green engagement use the following practices less frequently than green builders:

- Practices that create healthier indoor living environments.
- High-performance ventilation.

This finding suggests that green home builders/remodelers are much more attuned to the importance of creating healthier spaces as part of overall home performance, a finding reinforced by their own priorities (see page 8). Making consumers aware of practices designed to create healthier homes by green builders could help drive market demand.

Use of Green Practices on at Least 50% of Home Projects

According to Single Family Home Builder/Remodelers Doing Fewer Than 50% of Their Projects Green



Green Building Market Activity

EMERGING PRACTICES AND TECHNOLOGIES RESILIENT FEATURES

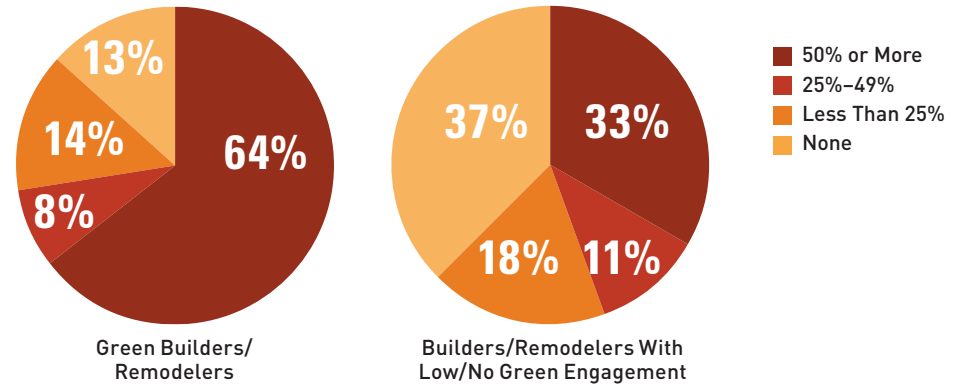
The increase in the incidence of severe weather has led to greater attention to resiliency, and that has started to appear in home building projects. Respondents were asked about the frequency of their use of resilient features to help homes withstand natural disasters (flooding, wind events, etc.) Green builders and remodelers are particularly conscious of its importance, with 87% including one or more resilient features on at least some projects, and 64% doing so on more than half the homes they build.

Even among those with less green involvement, nearly two thirds (63%) use resilient features on at least some of their projects, and one third do so on more than half of them.

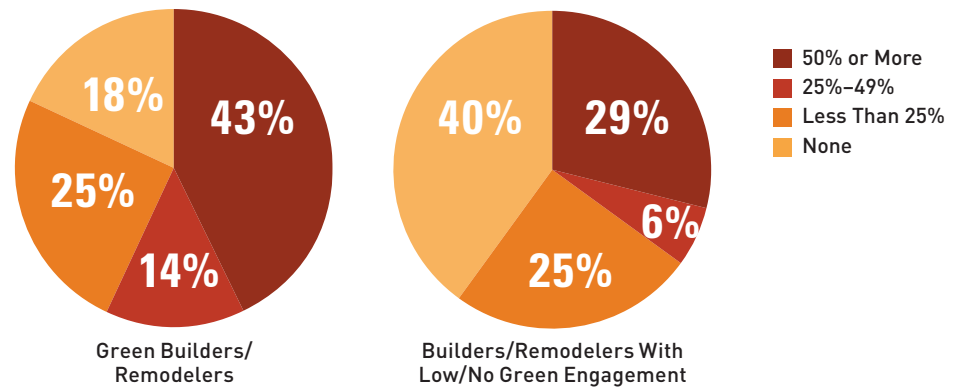
SMART HOME TECHNOLOGY FOR BETTER ENERGY MANAGEMENT

Smart home technology is becoming prevalent, and it can be considered green if it improves energy management. The percentage of builders and remodelers using this technology for energy management on at least some of their projects is high, with 82% of green builders and 60% of those less engaged in green reporting use. Almost half (43%) of green builders report using this technology on 50% or more of their projects, and well over one quarter (29%) of those with low/no green engagement report the same.

Use of Resilient Features by Builders/Remodelers



Use of Smart Home Technology for Energy Management by Builders/Remodelers



Marketing Green Homes

THE COST OF GREEN BUILDING

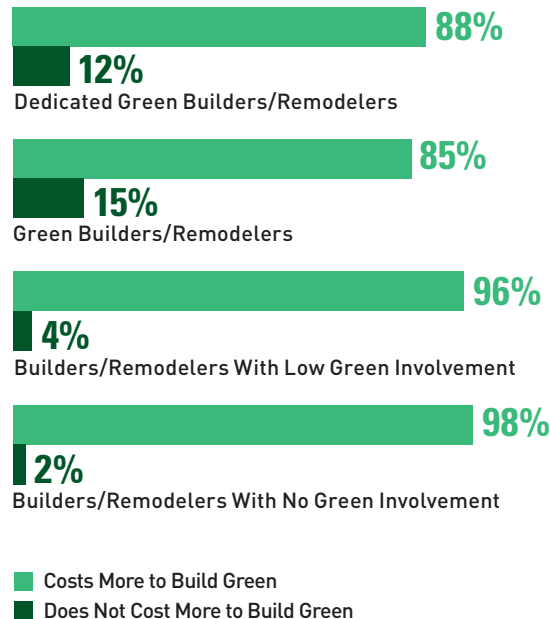
Most single family builders (86%), single family remodelers (72%) and multifamily builders/remodelers (74%) agree that building green costs more than building a traditional home. Even the majority of green builders agree, although the percentage who find that it does not cost more to build green is nearly three times those with low to no green involvement.

Among respondents who do green building projects, and believe that green building involves a cost premium, the highest percentage believe that the cost premium is between 5% and 10%. The findings are relatively consistent between dedicated green builders/remodelers (more than 90% of projects are green), green builders/remodelers (50% to 90% green projects) and those with low green involvement (fewer than 50% green projects).

In the previous study published in 2017, there was also general agreement that green building cost more, with the highest percentage selecting 5% to 10% as the average green premium.

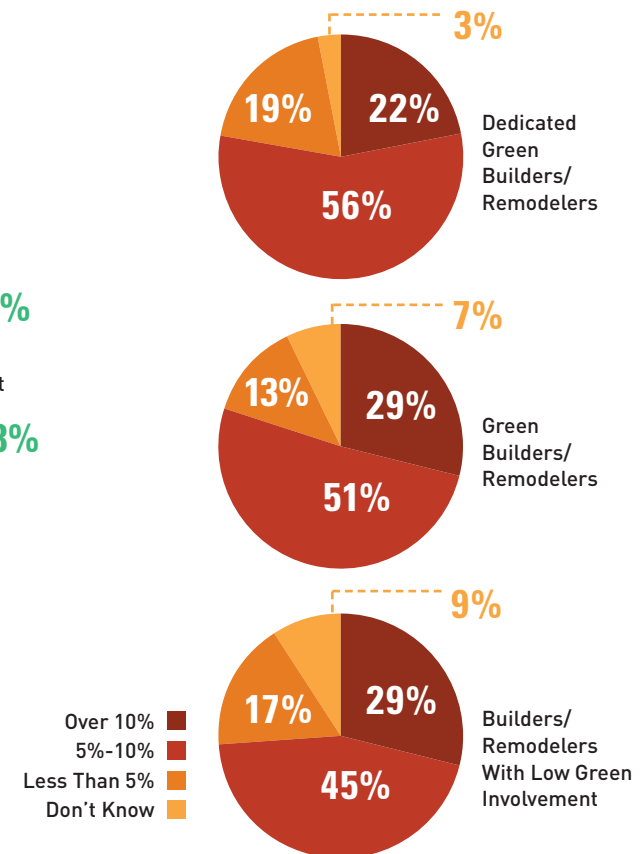
Does Green Building Have a Cost Premium?

According to Builders and Remodelers



Green Building Premium

According to Builders and Remodelers Reporting Some Green Involvement



Marketing Green Homes

BUILDERS/REMODELERS' PERCEPTIONS ABOUT CUSTOMER WILLINGNESS TO PAY A PREMIUM FOR GREEN HOMES

All respondents were asked if they believe that customers are willing to pay more for green, and the majority of single family builders (70%) and remodelers (64%) believe that customers will pay more. However, only slightly more than half (53%) of multifamily builders/remodelers agree. These findings are all consistent with those reported in the previous study from 2017, when 71% of single family builders, 66% of single family remodelers and 56% of multifamily builders reported that customers will pay more for green homes.

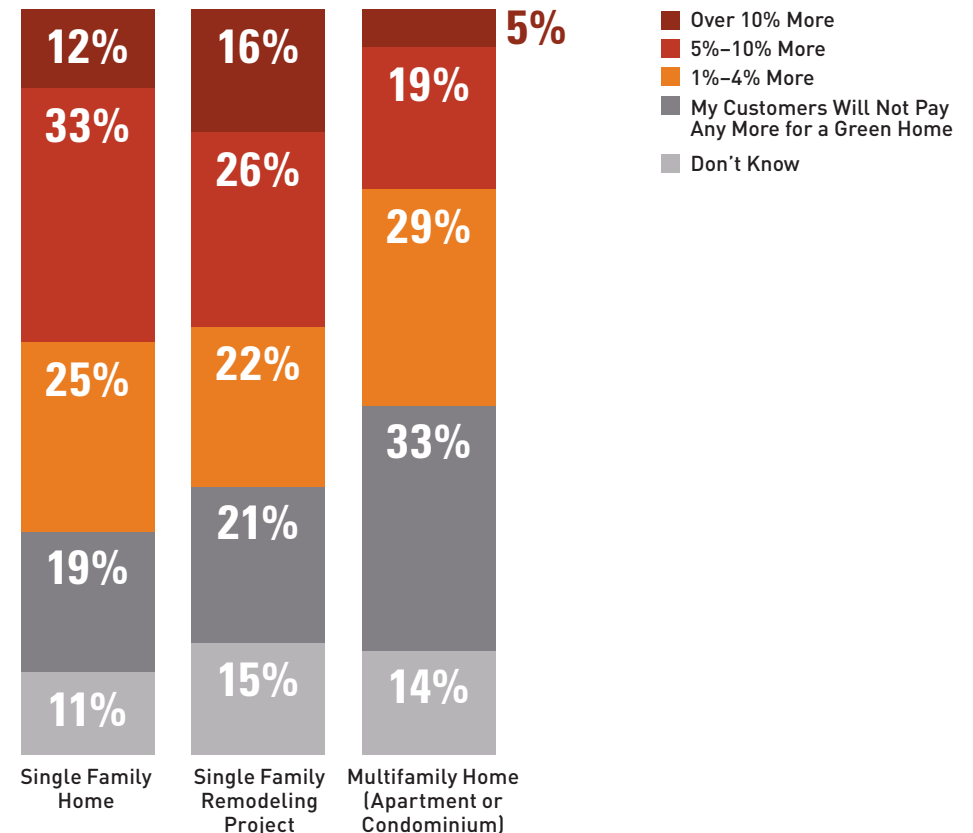
There is also greater optimism among single family builders and remodelers about how much more customers will pay for a green home, compared with how much additional they will pay for a green condominium or apartment. Nearly half (45%) of home builders think that customers will pay 5% or more over the cost of a traditional home, and 42% of remodelers believe their customers will pay that much more (5% or more) for a green remodeling project.

This is in sharp contrast to those doing multifamily projects, where only 24% believe that customers will pay 5% extra or more for green.

However, this does not mean that the respondents are not building the cost of green into their prices. Out of those who believe green costs more, 90% of single family builders, 96% of single family remodelers and 81% of multifamily builders/remodelers all state that they pass the additional costs of building green on to their customers.

Customers' Willingness to Pay More for a Green Single Family Home, Remodeling Project or Apartment/Condominium

According to Single Family and Multifamily Builders and Remodelers



Marketing Green Homes

TYPES OF HOME BUYERS MOST WILLING TO PAY MORE FOR GREEN HOMES

Green home builders (those doing more than 50% of their projects green) believe that buyers seeking to upscale are most likely to be willing to pay a premium for a green home, with 63% who believe that they are somewhat to very likely to pay more.

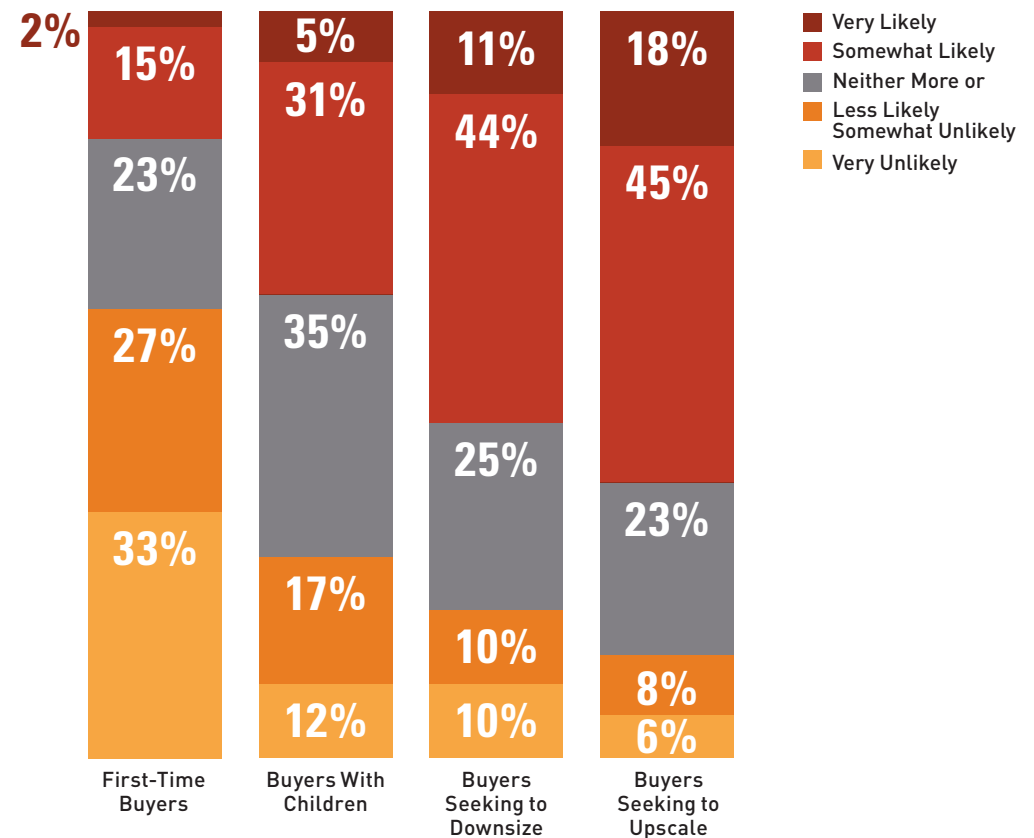
The second biggest category, selected by over 50% as at least somewhat likely to pay a green premium, are buyers seeking to downsize. The biggest similarity between buyers who downsize and buyers who seek to upscale is that they are typically a little older than first-time buyers, and often older than buyers with children.

First-time buyers, typically the youngest of these groups, are also perceived to be the least likely to be willing to pay for a green premium. The initial cost of a home is likely to be more important for them than it is for the other groups, who may be willing to give greater weight to the total cost of ownership of the home based on performance over time.

However, it is surprising that buyers with children are less likely to pay more for green homes than those downsizing or upscaling. This may suggest that buyers are not making the connection between healthier and green homes (per the finding on page 15), and could offer an opportunity to promote customer awareness of this connection.

Likelihood That Home Buyers Will Pay a Green Premium

According to Green Home Builders



Marketing Green Homes

GREEN HOME BUILDERS' PERCEPTIONS OF THE MOST INFLUENTIAL FACTORS ON CUSTOMERS' DECISIONS ABOUT PAYING A PREMIUM FOR A GREEN HOME

Most green home builders who believe that their customers are likely to pay a premium for a green home believe that lower operating costs is an influential factor, regardless of the type of buyer. It ranks first for three out of the four categories of buyers, and for first-time buyers and buyers seeking to downsize, it ranks first by a high margin.

However, green home builders believe that the top factor influencing the willingness of buyers with children to pay a green premium is improved health and well-being. One challenge is that this benefit is often the hardest to measure and prove, especially compared with benefits like lower utility bills or greater comfort.

The desire to do the right thing is considered influential by many builders on the decisions of first-time home buyers, many of whom are more likely to be millennials with a greater environmental consciousness. However, first-time buyers are also the most cost-conscious group, which is probably why lower operating costs are still the most influential for them.

Top Factors Influencing Decision to Pay a Green Premium

According to Green Home Builders Who Believe These Customers Are Likely to Pay a Green Premium

	FIRST-TIME BUYERS	BUYERS WITH CHILDREN	BUYERS SEEKING TO UPSCALE	BUYERS SEEKING TO DOWNSIZE
Most Frequently Selected	53% Lower Operating Costs	42% Improved Health and Well-Being	36% Lower Operating Costs	55% Lower Operating Costs
Second Most Frequently Selected	32% Desire to Do the Right Thing/ Reduce Carbon Footprint	35% Lower Operating Costs	33% Greater Comfort/ Better Occupant Experience	21% Greater Comfort/ Better Occupant Experience

Marketing Green Homes

TOP WAYS CUSTOMERS EXPERIENCE VALUE FROM GREEN HOMES

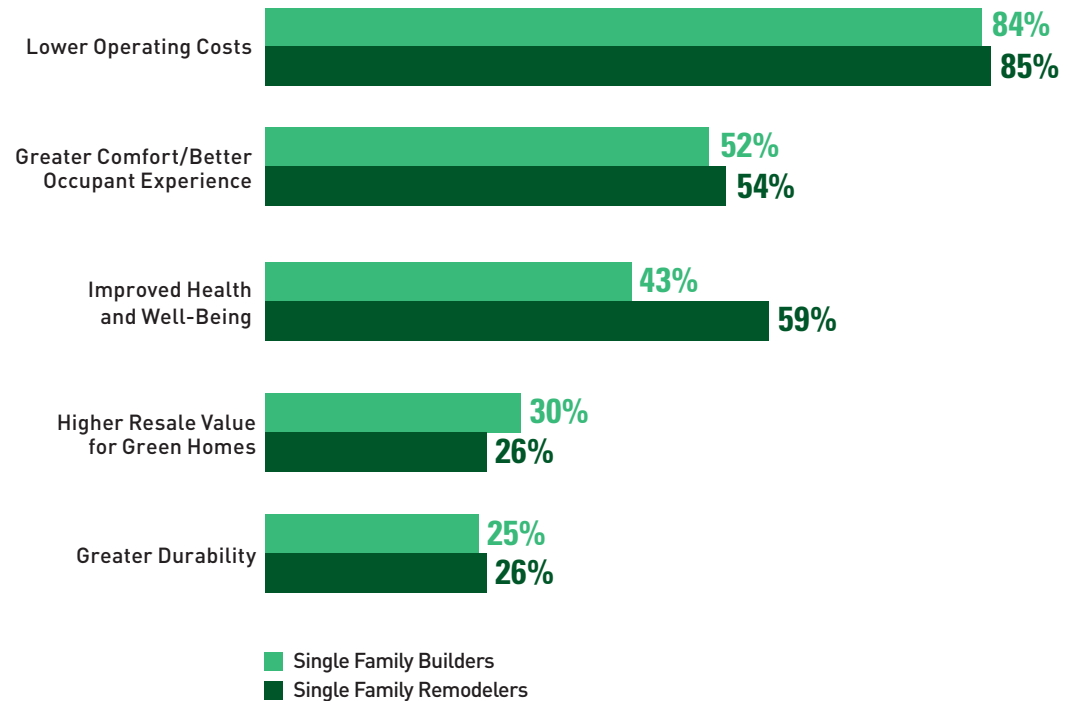
Green homes may come with a cost premium, but single family builders and remodelers both perceive that owners of green homes experience value from their homes that typically exceeds any additional original cost.

Both builders and remodelers agree that lower operating costs for a green home is one of the top ways these homes provide value in excess of the cost premium for their owners.

Greater comfort and a better occupant experience are also cited by more than half of single family builders and remodelers as ways to add value that make up for the initial investment, and improved health and well-being is selected by nearly 50% of builders and even more remodelers (59%). These findings correspond to the similar percentage (56%) who reported that techniques that support healthier indoor living environments are one of the top practices to improve green home performance (see page 8).

Top Ways Customers Experience Value That Exceeds the Cost Premium for Green Homes

According to All Single Family Builders/Remodelers Who Believe That Green Homes Involve a Cost Premium



Marketing Green Homes

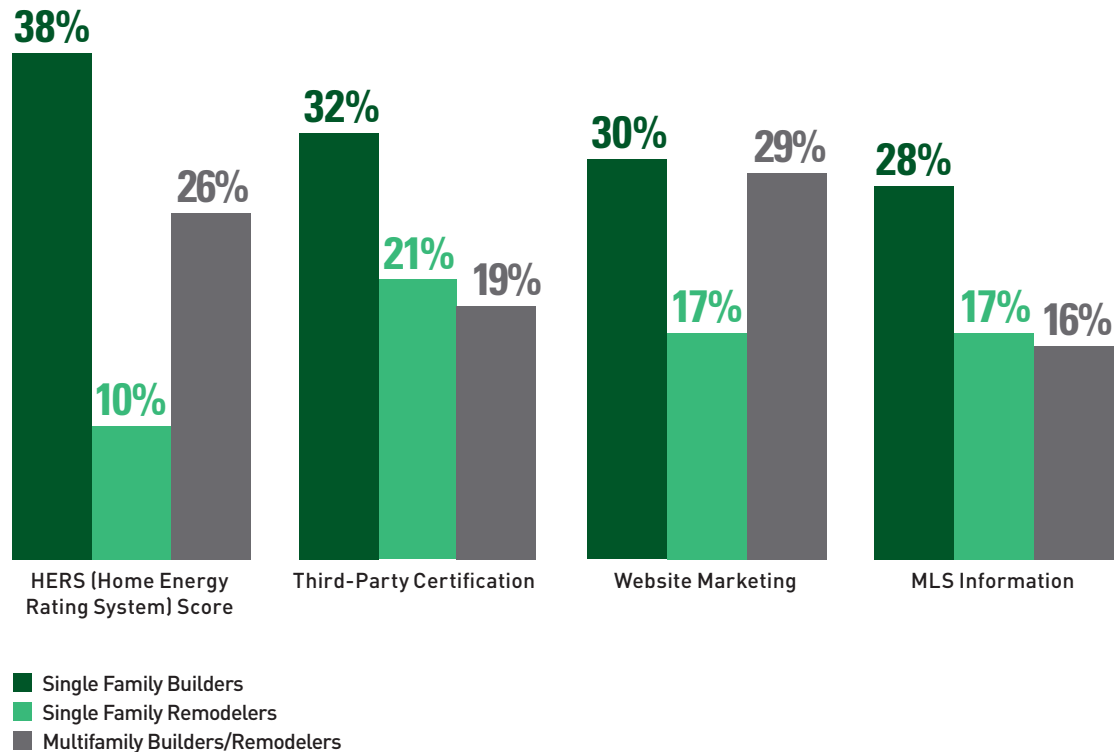
DEMONSTRATING TO CUSTOMERS THAT A HOME/APARTMENT/CONDOMINIUM IS GREEN

All single family builders, single family remodelers and multifamily builders/remodelers who participated in the survey were asked to select each of the ways in which they show customers that a home or apartment/condominium is green. Interestingly, there is no single consistent way selected by the majority of builders/remodelers.

- Single family home builders are the most frequent users of all of the top methods, but even among them, only about one third use any particular method, with HERS score at the top.
- Multifamily builders/remodelers most frequently use HERS score and website marketing.
- Single family remodelers are the least likely to demonstrate to their customers that homes are green, with only 21% selecting third-party certification as the means to do so, and no other item selected by 20% or more.

VARIATION BY REGION MLS information is significantly more widely used in the South (30%) than it is in the Midwest (16%), with no significant differences to either the Northeast (27%) or West (19%).

Top Ways Builders/Remodelers Demonstrate That Homes/Apartments/Condos Are Green



Marketing Green Homes

MOST EFFECTIVE TERMS FOR DESCRIBING GREEN FEATURES

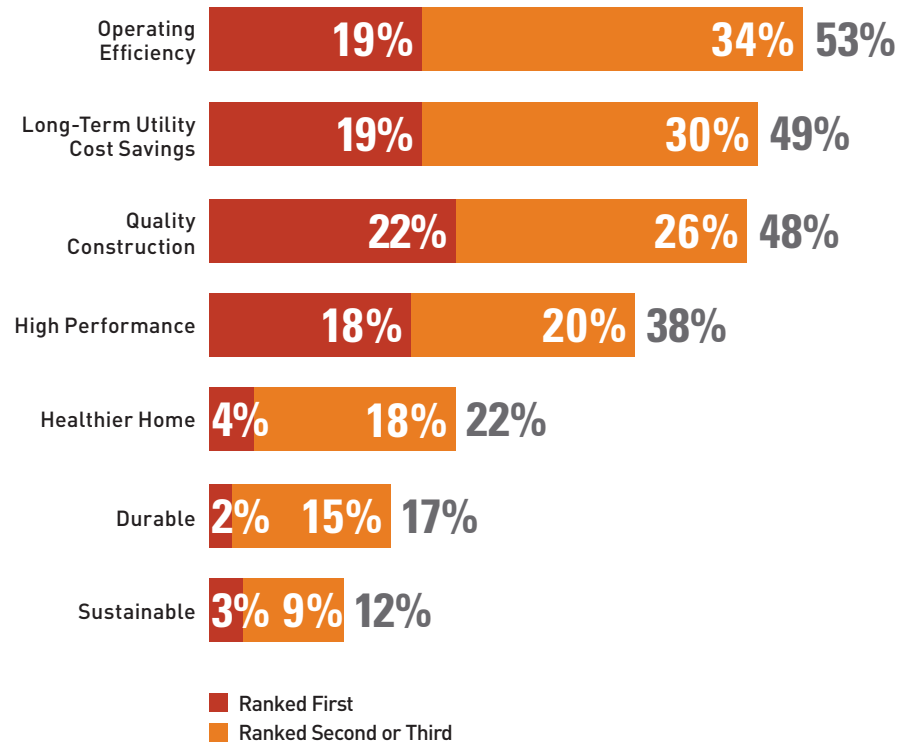
Home builders and remodelers were asked to rank the top three most effective terms for describing green features that have the greatest influence on their customers.

- The top two terms—operating efficiency and long-term utility savings—both reflect the importance of having reduced operating costs.
- Quality construction comes in a close third among options ranked in the top three, but it has the highest percentage of any option of those who rank it first. This suggests that among those who value it, it is considered particularly effective.
- Similarly, even though high performance is only ranked in the top three by 38%, a relatively high share of those who select it at all rank it first, suggesting that many contractors have found it a highly effective term to use.
- The term healthier home is considered far less effective, even though builders cite constructing healthier homes as a top reason they build green (see page 4). This may be connected to the challenge in proving a home is healthier to consumers.

VARIATION BY REGION High performance is ranked first by significantly more respondents from the South (20%) than those in the Northeast (11%), but there are no significant differences between those ranking it first in the Midwest (19%) or West (15%) and the South or Northeast.

Most Effective Terms for Describing Green Features

Ranked in Top Three by All Respondents



Marketing Green Homes

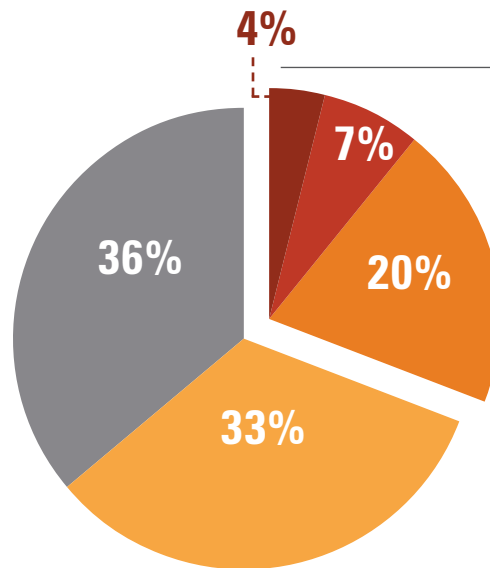
APPRAISALS THAT REFLECT THE ADDED VALUE OF A GREEN HOME

It is still relatively rare for builders/remodelers who construct green homes to see the additional value of green reflected in the appraisal. Only 11% report that this occurs frequently/always, and 69% say it is either infrequent or never happens.

Among those who do see that added value reflected, nearly half (44%) think that the most useful information to provide is a third-party green rating of the property. The objectivity of the rating system provides tangible support for the expectation of higher performance.

AHERS score is also useful according to 30% of these respondents, but green appraisal forms are only considered the most useful means by 15%.

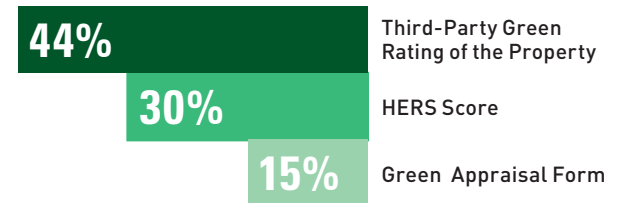
Frequency With Which Builders/Remodelers See Home Appraisals That Reflect the Added Value of a Green Home



- Always
- Frequently
- Sometimes
- Infrequently
- Never

Most Useful Information to Reflect Added Value in Appraisals for Green Homes

According to Respondents Who Sometimes/Frequently/Always See Home Appraisals Reflecting That Value



Marketing Green Homes

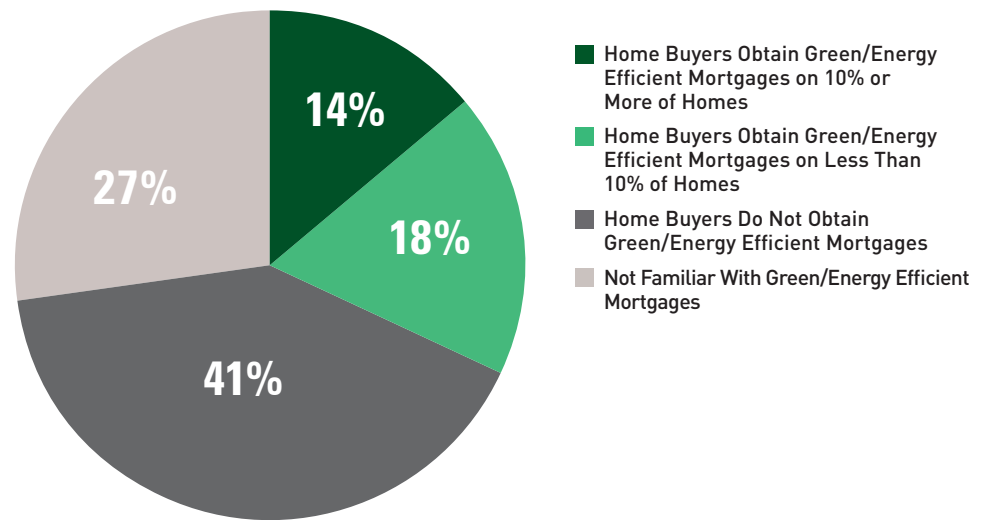
GREEN BUILDERS' PERCEPTIONS ABOUT THE FREQUENCY OF USE OF GREEN/ENERGY EFFICIENT MORTGAGES

Green builders were asked about the frequency with which they believe home buyers obtain green or energy efficient mortgages on the homes they build. Several reported that they were not familiar with the types of mortgages their customers obtain, and they are not included in the chart at right. Among those who are at least familiar with mortgages obtained by their customers:

- Nearly one third (32%) believe that at least some home buyers are obtaining green/energy efficient mortgages on their homes, with 14% who believe it occurs on 10% or more of the homes they build and 18% who find it only occurs on less than 10% of their home projects.
- The highest percentage (41%) do not believe any home owners have obtained green/energy efficient mortgages on the homes they build.
- About one quarter (27%) are not familiar with these types of mortgages themselves.

Green Builders' Experiences With the Frequency With Which Home Buyers Obtain Green/Energy Efficient Mortgages on the Homes They Build

According to Green Builders Familiar With the Mortgages Home Buyers Obtain



Marketing Green Homes

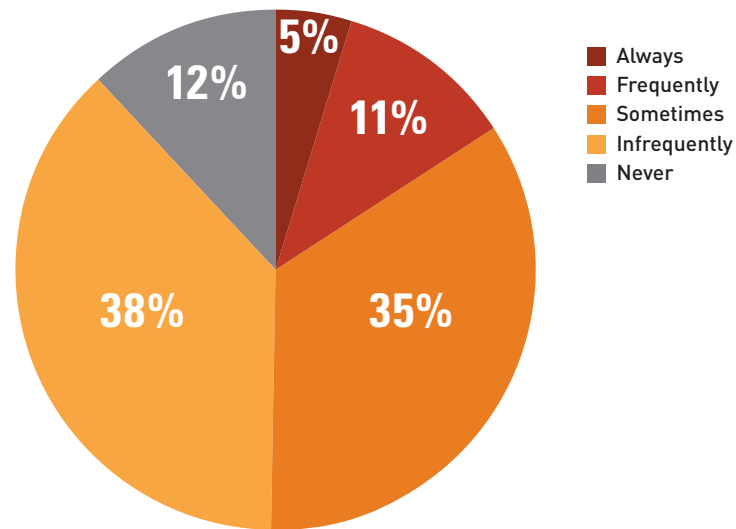
FREQUENCY OF GREEN FEATURES BEING REFLECTED IN MLS LISTINGS

Most (88%) of the green home builders report that they see green features reflected in the MLS listings, with the majority saying it happens sometimes or infrequently, and only 16% who say that it is a frequent occurrence.

The result that 88% responded positively indicates that the MLS have the capability to accept the information. Greater use of this marketing tool could help home buyers interested in green be more aware of available market options.

Frequency That Green Features Are Reflected in MLS Listings

According to Green Home Builders



Drivers and Obstacles for Green Homes

TOP DRIVERS FOR MORE GREEN SINGLE FAMILY HOMES

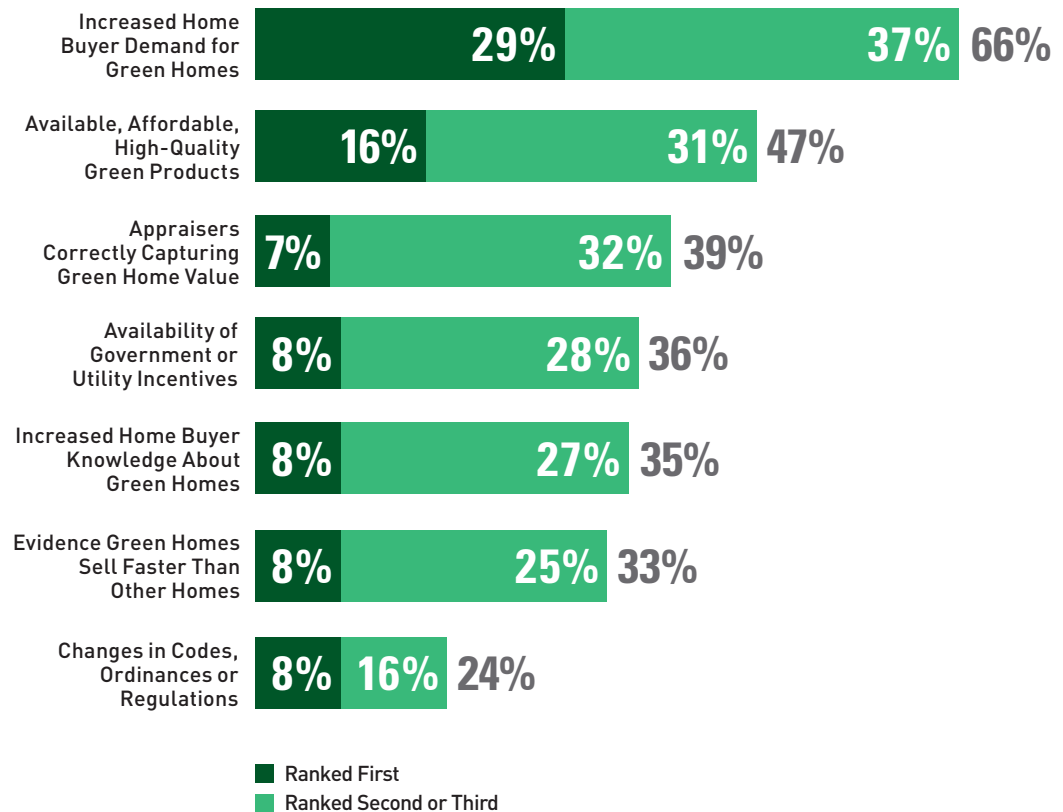
Home builders and remodelers were asked to rank the top three drivers that would encourage them to do more green single family home projects from a list of 11 options. The top seven are shown in the chart at right.

Increased home buyer demand for green homes is the top driver, ranked in the top three by two thirds, and ranked first by almost one third.

The only other factor ranked first by more than 10% of respondents, and included in the top three by nearly half, is more available, affordable, high-quality green products. This suggests price sensitivity is a critical issue, and corresponds with the findings on the top obstacles (see page 24).

The other factors relate to increasing home buyer demand, such as appraisals reflecting the value of green, increased knowledge about green among consumers and evidence that green homes sell faster than traditional ones.

Top Drivers for More Green Single Family Home/Remodel Projects



Drivers and Obstacles for Green Homes

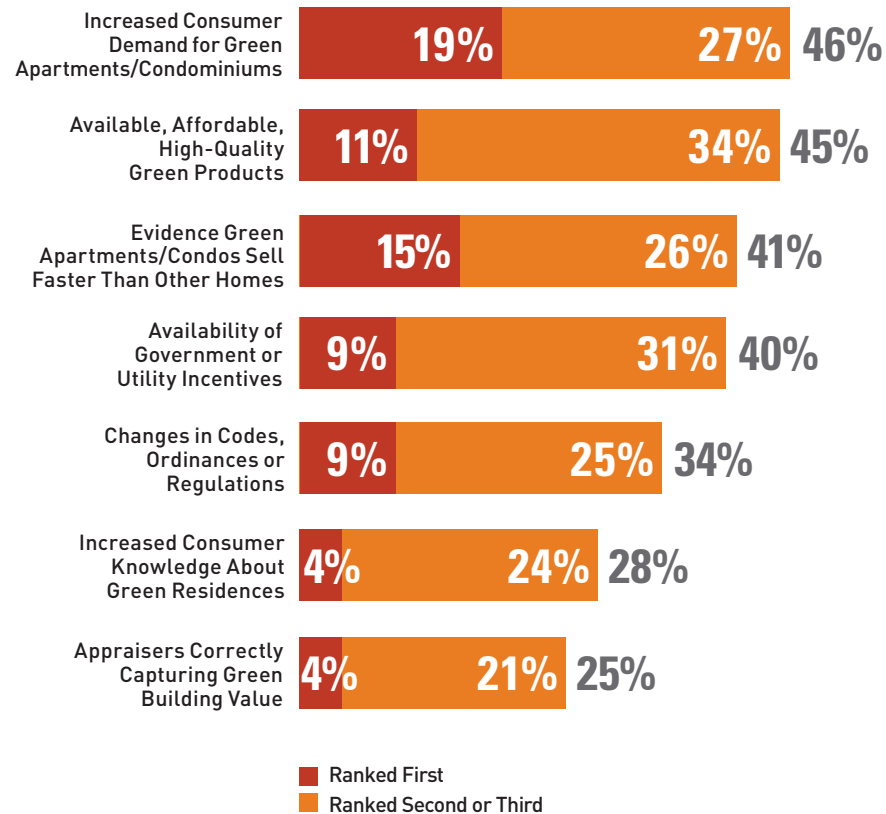
TOP DRIVERS FOR BUILDING MORE GREEN MULTIFAMILY HOMES AND REMODEL PROJECTS

Similar to green single family homes, the top drivers for green multifamily homes are increased consumer demand and available, affordable high-quality green products. However, unlike the single family drivers, where increased consumer demand is selected by considerably more respondents in the top three, there is much greater parity between these two drivers in the multifamily market.

Evidence that green condominiums/apartments would sell faster than traditional ones is ranked first by a relatively high percentage of multifamily respondents. The ability to sell/rent spaces quickly is an important success factor in the multifamily sector, so it is not surprising that this carries weight with the respondents.

Government or utility incentives are also a more important driver for multifamily respondents than they are for single family respondents. On the other hand, appraisals are ranked as a top driver by more single family respondents (39%) than they are by multifamily ones (25%).

Top Drivers for More Green Multifamily Home/Remodel Projects



Drivers and Obstacles for Green Homes

DRIVERS AND OBSTACLES
GREEN SINGLE FAMILY AND MULTIFAMILY HOMES 2020

TOP OBSTACLES FOR BUILDING MORE GREEN SINGLE FAMILY HOMES/REMODEL PROJECTS

Single family builders and remodelers were asked to rank their top three obstacles from a list of six potential ones. All six are shown in the chart at right.

The obstacles support the conclusion that consumer demand and cost are the most important factors limiting more green growth in the single family market. Over three quarters (78%) of single family home builders and remodelers report that lack of demand is the biggest obstacle preventing them from building more green homes. A close second is the price premium required, and the price, quality and availability of green products is also a concern.

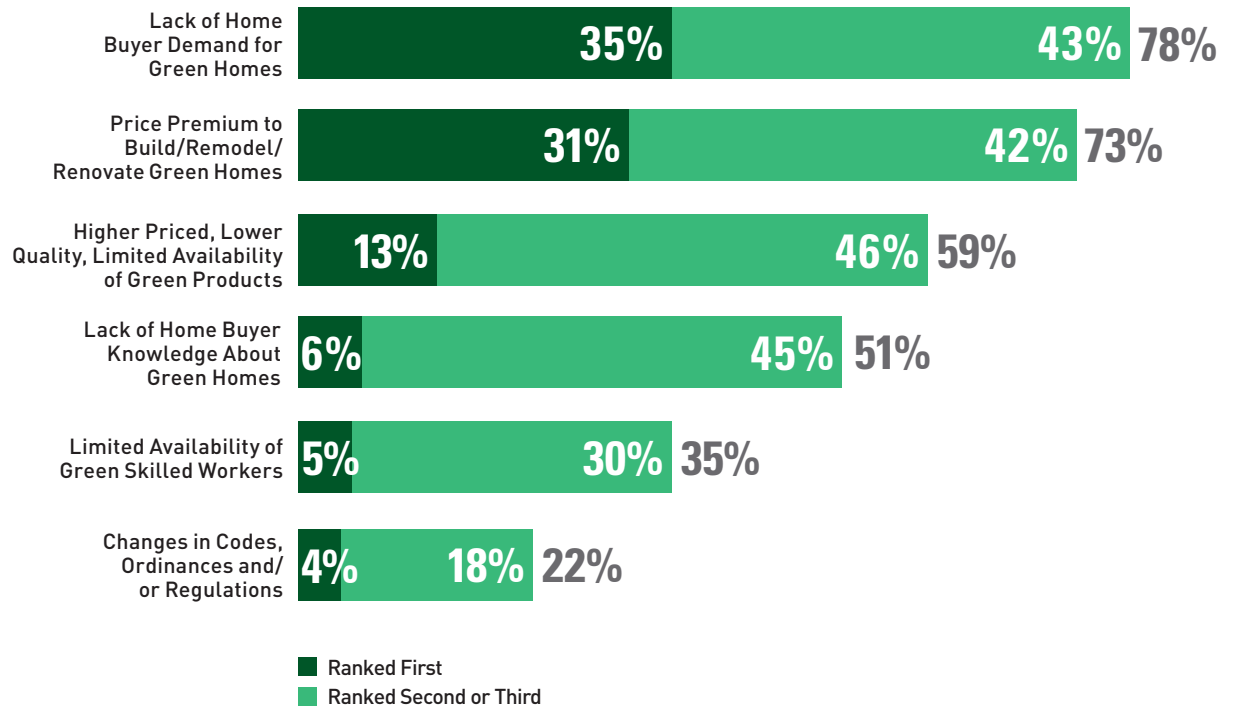
Despite overall industry concerns about skilled workers¹, concerns about them rank relatively low in this list.

VARIATION BY LEVEL OF GREEN INVOLVEMENT

9% of dedicated green builders (doing more than 90% green projects) see code changes as an obstacle compared with 2% of those doing no green building.

¹Labor shortages most recently reported in the NAHB/Wells Fargo Housing Market Index (<http://eyeonhousing.org/2019/08/labor-shortages-still-hurting-affordability/>) and in the quarterly Commercial Construction Index (<https://www.uschamber.com/report/usg-us-chamber-of-commerce-commercial-construction-index-2019-q4>)

Top Obstacles for More Green Single Family Home/Remodel Projects



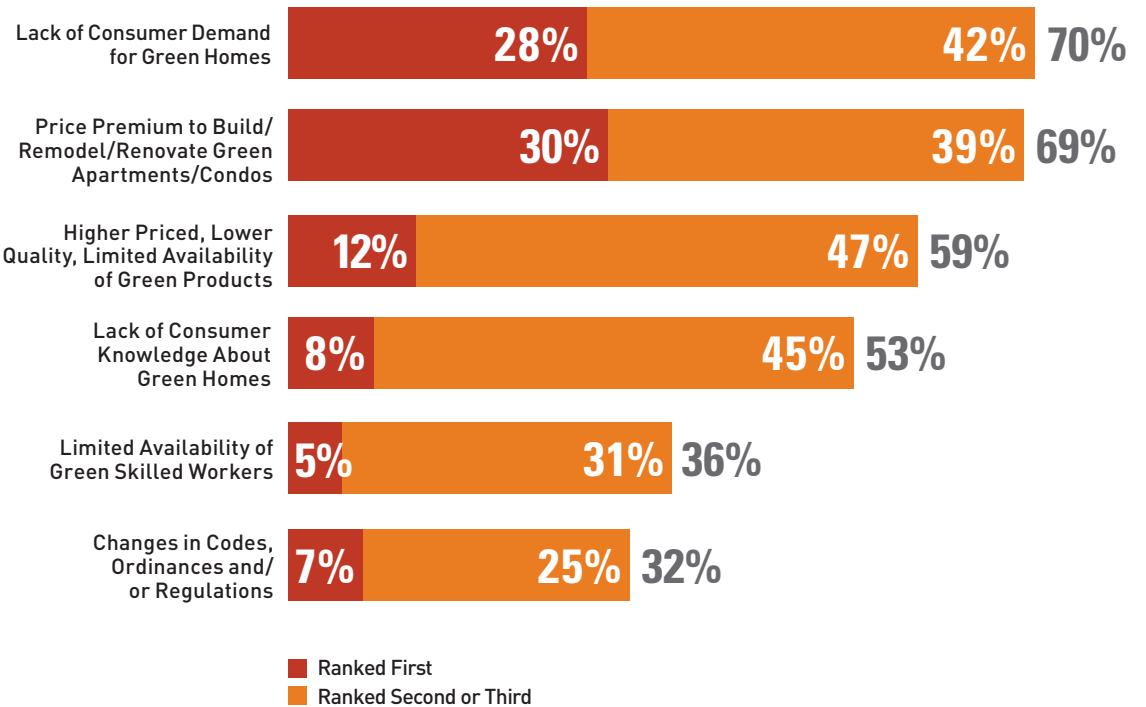
Drivers and Obstacles for Green Homes

TOP OBSTACLES FOR BUILDING MORE GREEN MULTIFAMILY PROJECTS

Presented with a similar list of obstacles, multifamily builders and remodelers tend to find the same issues to be significant obstacles to increasing the number of green projects they undertake.

- As with the single family respondents, lack of consumer demand is selected by the highest percentage as one of the top three obstacles.
- The price premium for green, though, has the highest percentage who rank it first as an important obstacle.
- Green products rank third for multifamily builders/remodelers, as they do for single family ones.
- Around one third or more of multifamily respondents rank at least one of these six options in their top three, which suggests that each of them is influencing the market.

Top Obstacles for Building More Green Multifamily Projects



Drivers and Obstacles for Green Homes

HOW BUILDERS PERCEIVE CONSUMER BELIEFS ABOUT GREEN HOMES

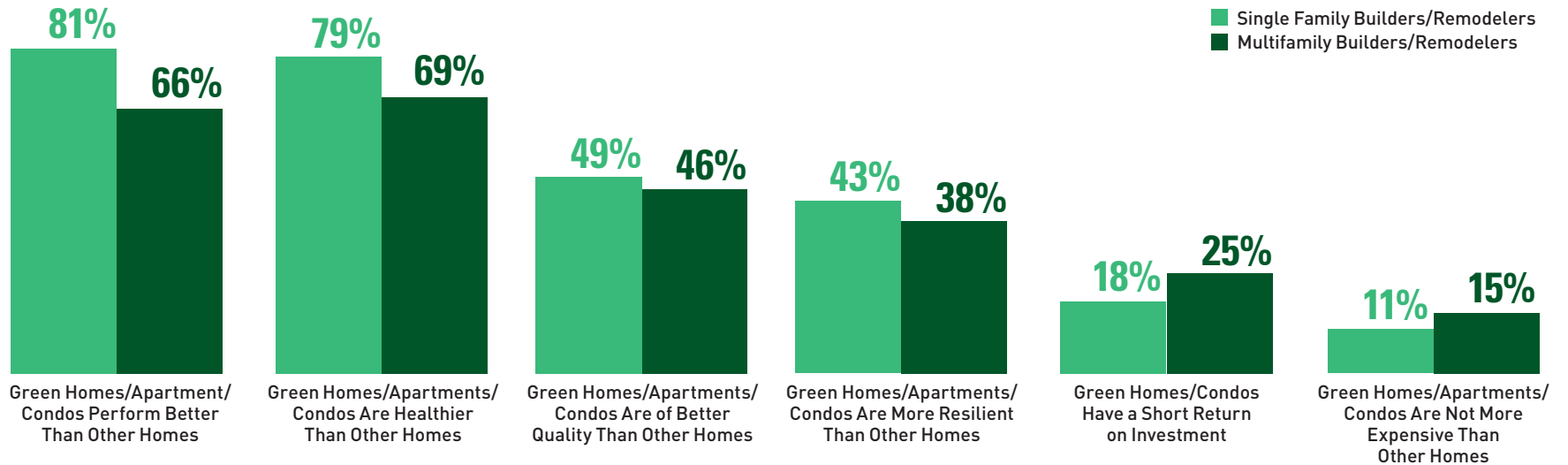
Over three quarters of single family builders and remodelers agree that consumers believe that green homes perform better than traditional homes and are healthier, but only about two thirds of multifamily firms believe that consumers of green apartments/condominiums recognize these benefits.

Fewer than half of all respondents think that consumers perceive green homes to be higher quality or more resilient. The vast majority also acknowledge that

consumers anticipate green residential projects will cost more and are not expecting a short return on investment.

VARIATION BY LEVEL OF GREEN INVOLVEMENT Dedicated green builders (more than 90% green projects) are significantly more likely to believe consumers regard green homes as performing better (90%), of higher quality (65%) or more resilient (54%) than are those who do no green projects (74%, 43% and 36%, respectively.)

Percentage of Builders/Remodelers Who Believe That Consumers Commonly Hold These Perceptions of Green Homes/ Apartments/Condominiums



Drivers and Obstacles for Green Homes

INFLUENCE OF CONSUMER PERCEPTIONS ON BUILDER/REMODELER DECISIONS TO DO MORE GREEN PROJECTS

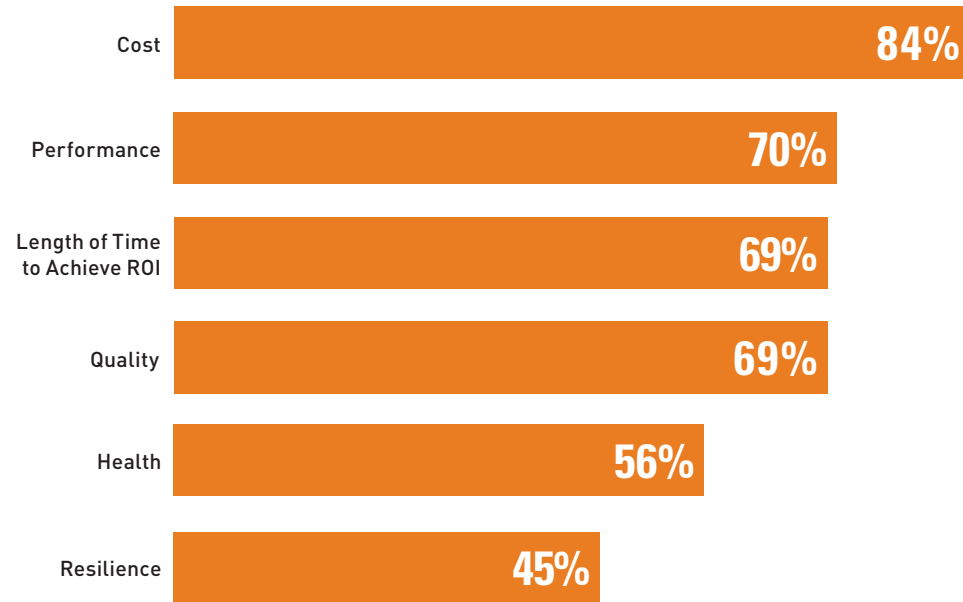
The highest percentage of builders/remodelers cite consumer perceptions about cost as influential on their decision to build more green projects.

Given the perceptions about cost that builders believe consumers have (see page 26), this finding corresponds to the previous one that over two thirds (69%) regard the price premium to build green as one of the top obstacles to undertaking additional green projects (see page 25).

Almost three quarters (70%) of builders/remodelers credit consumers' perceptions on performance with being influential/very influential on their decision to build more green, and most of them also found that consumers regard green home performance as better than that of a traditional home.

These findings suggest that, in order to appeal to consumers, builders face a delicate balance between how they price green homes and the decision to add green features designed to improve building performance and lower operating costs.

Builders/Remodelers Who Rate Each Consumer Perception as Influential/Very Influential in Their Decision to Build More Green Projects



Use of Green Products and Practices

INFLUENCE OF GREEN ATTRIBUTES IN BUILDER/REMODELER PRODUCT SELECTION

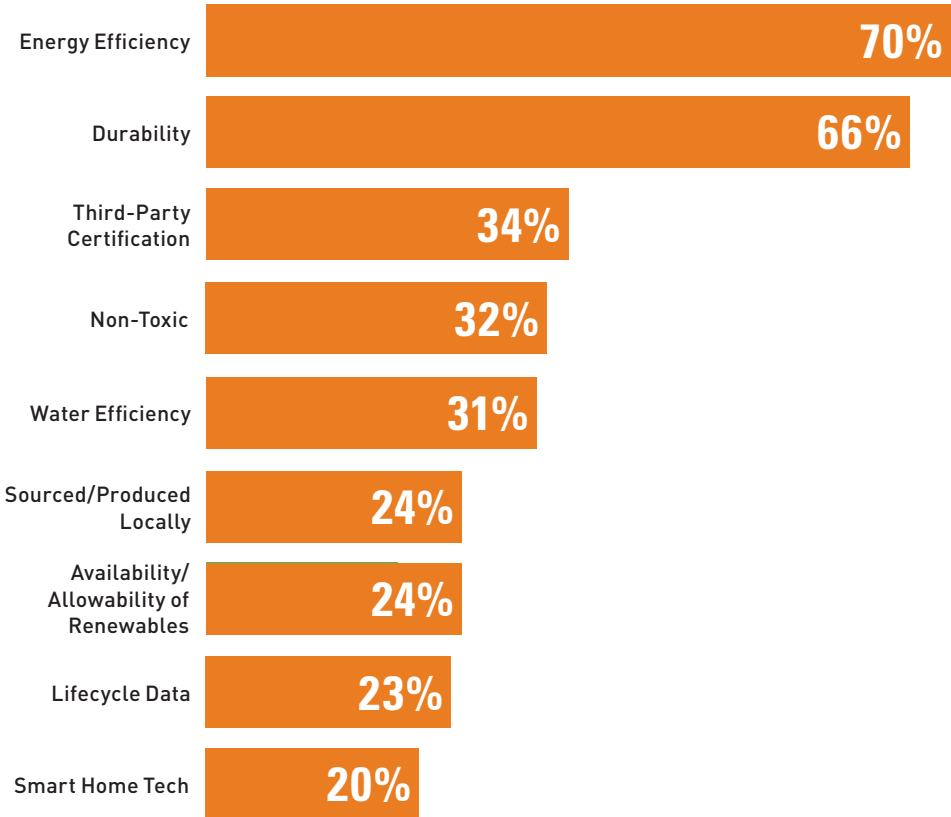
All single family and multifamily builders/remodelers were asked to rate the impact of several green attributes on their product/system selections. Energy efficiency and durability are the most influential, with at least two thirds who consider them highly influential. These high rankings are consistent with the findings of previous studies conducted by Dodge for NAHB.

About one third of respondents are highly influenced by third-party certifications, avoiding toxins and water efficiency. The large number of product certifications and the difficulty of establishing the content of most products likely reduce the influence of certifications and being non-toxic. Water efficiency is not as influential as energy efficiency, but is still an important green attribute.

Least influential are factors that are perceived to be expensive (renewables), are less well known (local sourcing and lifecycle data) or emerging (smart home tech).

Influential Green Attributes for the Selection of Products/Systems

Rated High/Very High Impact by Builders/Remodelers



Use of Green Products and Practices

INFLUENCE OF GREEN PRODUCT/SYSTEM ATTRIBUTES BY GREEN BUILDING ENGAGEMENT

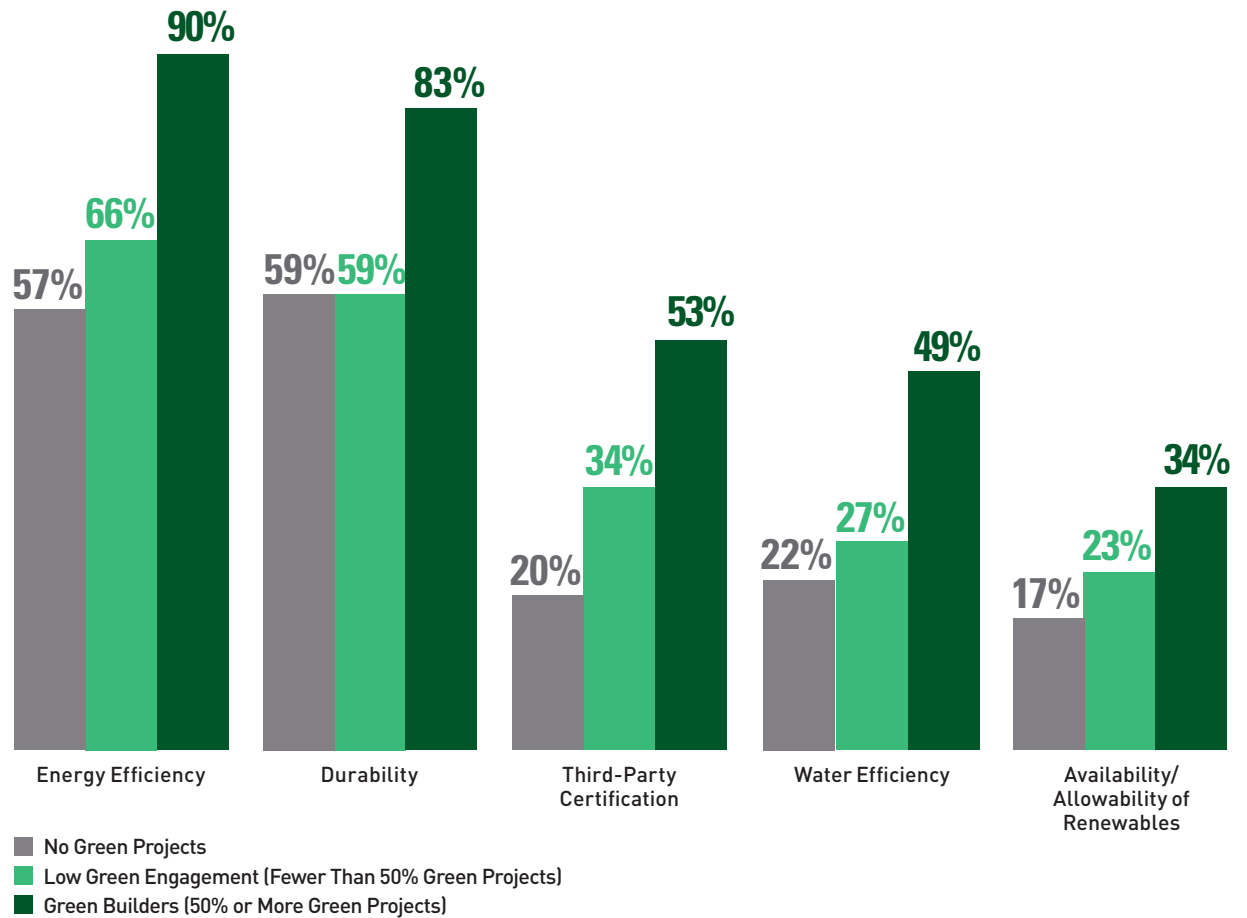
The most influential attributes for green practitioners when selecting products are primarily the most widely used ones in the industry, with 90% of green builders and remodelers influenced by energy efficiency, 83% by durability, 53% by third-party certification of products, 49% by water efficiency and 34% by the ability to use renewables.

Attributes ranked less influential overall, including avoiding toxic chemicals, using product lifecycle data and locally sourced/products, were not rated highly influential by a significantly larger percentage of green builders than those doing fewer green projects.

There are no significant differences in the high/very high influence rankings between dedicated green builders (more than 90% green projects) and those doing 50% to 90% green projects for any of the nine attributes included.

Influential Green Attributes for Product Selection by Level of Green Engagement

Rated High/Very High



Use of Green Products and Practices

FREQUENCY WITH WHICH HOME BUYERS/OWNERS ASK BUILDERS/REMODELERS ABOUT SPECIFIC GREEN PRODUCTS AND SYSTEMS

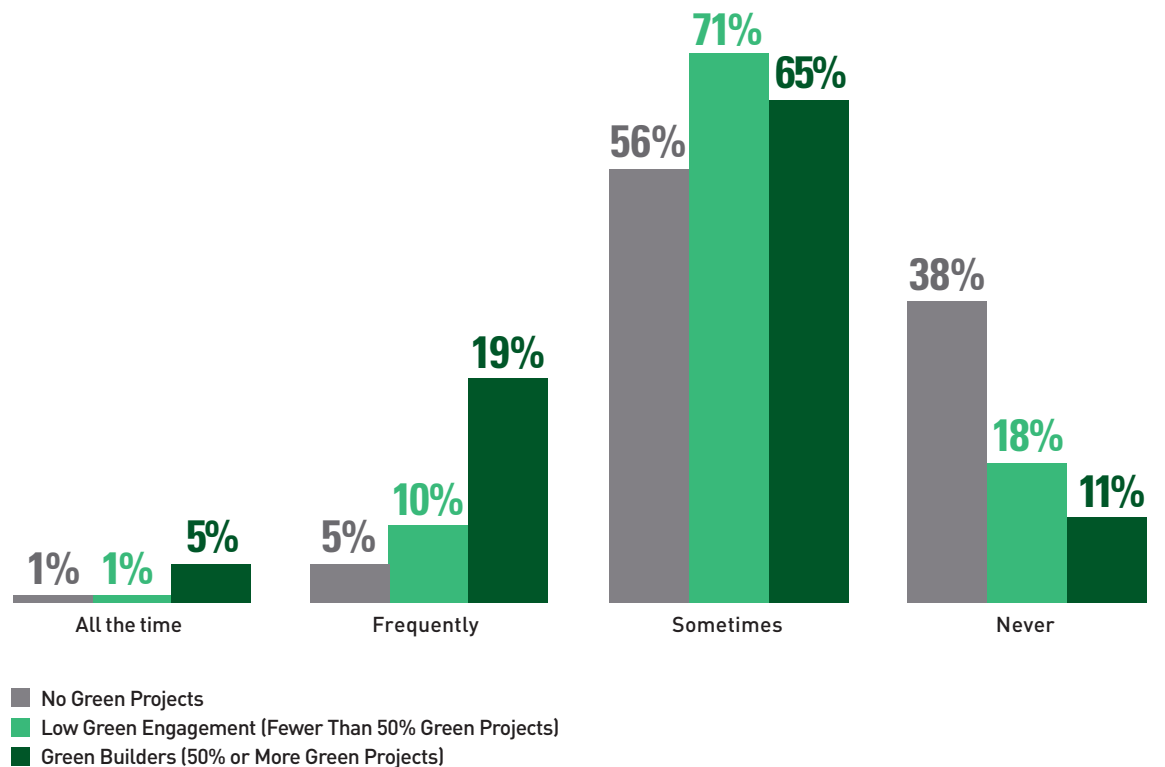
Most (89%) green builders report that their customers have asked about green products, and a high percentage of those doing fewer green homes (82%) report that their customers had as well. Almost two thirds (62%) of those who do not build green homes or do green remodeling projects report being asked about specific green products by home owners/buyers.

The highest percentage of builders/remodelers at all levels of green involvement report that they receive these inquiries only sometimes.

These findings suggest that all builders and remodelers need to be sufficiently familiar with green products to engage with owners who are interested in them, whether the company specializes in green or not.

Frequency of Home Buyers/Owners Asking About Specific Green Products/Systems

According to Builders/Remodelers



Use of Green Products and Practices

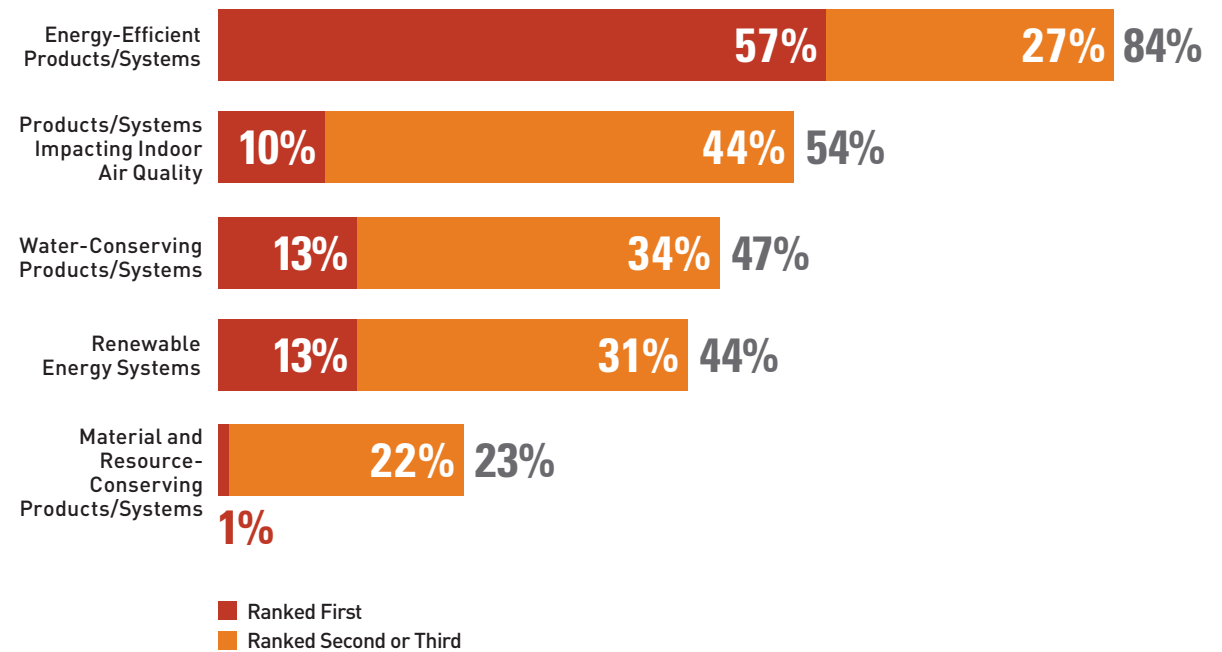
TYPES OF GREEN PRODUCTS AND SYSTEMS THAT BUILDERS/REMODELERS ARE MOST FREQUENTLY ASKED ABOUT BY HOME OWNERS/BUYERS

Like builders, home owners are most interested in energy-efficient products and systems. Over half (57%) of builders rank this first among the products/systems they get inquiries about, and most (84%) rank it in their top three.

Around half of builders and remodelers rank products/systems impacting indoor air quality, water-conserving products and systems, and renewable energy systems in their top three. Like builders and remodelers themselves believe, consumers are interested in products and systems that directly impact home performance, indoor environmental quality and utility bills.

Green Products/Systems Most Frequently Asked About by Home Owners/Buyers

According to Builders/Remodelers Who Are Frequently Asked by Home Owners/Buyers About Products



Use of Green Products and Practices

MOST WIDELY USED ENERGY-CONSERVING PRODUCTS/PRACTICES

In order to understand which green products/systems are in wide use, builders/remodelers were asked to select the types of products they use on more than 50% of their projects. The table at right shows the energy-conserving products and practices used by more than half of the respondents. Whether or not a project is green, there is a common focus on energy conservation, with over half of all builders and remodelers using the eight energy-conserving products and practices shown in the table on over half their projects.

The table also demonstrates that green builders/remodelers are much more likely than other respondents to use all of these products on half or more of their projects, with roughly three quarters or more using each at this level. The only practice used even more by dedicated green builders (more than 90% green projects) is right-sizing HVAC systems (93%).

LEDs, energy-efficient appliances and right-sizing the HVAC system are all widely used, as they have been in previous studies conducted by Dodge on these products.

Almost two thirds are also using insulation exceeding code minimums (63%) and focusing on air tightness (60%), and over half perform blower door testing (53%), which suggests that these products and practices are also becoming more commonly used by builders and remodelers.

Most Widely Used Energy-Conserving Products and Practices

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
LED Lighting	85%	91%
Energy-Efficient Appliances	76%	88%
Right-Sizing HVAC System	72%	87%
Highly Efficient HVAC and/or Water Heating Equipment	67%	85%
Insulation Exceeding Code Minimums	63%	82%
Windows Exceeding Code-Mandated Performance	62%	75%
Focus on Air Tightness	60%	81%
Blower Door Testing	53%	73%

Use of Green Products and Practices

LESS FREQUENTLY USED ENERGY CONSERVING PRODUCTS AND PRACTICES

Fewer than one third of builders/remodelers report using seven energy conserving products and practices included in the study. Most of these are not products but instead involve specific practices.

Findings from NAHB’s 2019 *What Home Buyers Really Want* survey¹ reveal that buyer preference for passive solar is well above 50% in all regions, which suggests that builders and remodelers have an opportunity to distinguish themselves in the market with use of this approach, since only 11% of all builders/remodelers and 18% of green ones are currently using passive solar design on half or more of their projects.

VARIATION BY LEVEL OF GREEN INVOLVEMENT Around half of green builders are adopting above code energy programs (54%), obtaining a HERS score (51%) and using balanced ventilation (45%). Higher (but not statistically significant) rates of involvement were reported by dedicated green builders (more than 90% green projects) for obtaining a HERS score, using blower door testing and focusing on air tightness.

¹ National Association of Home Builders, *What Home Buyers Really Want* 2019, <https://www.builderbooks.com/what-home-buyers-really-want-products-9780867187731.php>

Other Energy-Conserving Products and Practices

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
Use of Daylight in Design	32%	36%
Above Code Energy Program	31%	54%
Balanced Ventilation (ERV/HRV)	28%	45%
Obtain HERS Score	26%	51%
Following ACCA Manual J, D and S	22%	36%
Passive Solar Design/Orientation for Natural Heating and Cooling	11%	18%
Following ASHRAE 62.1	9%	21%

Use of Green Products and Practices

USE OF WATER-CONSERVING PRODUCTS AND PRACTICES

Over half of builders and remodelers use four water-conserving practices on 50% or more of their projects. Three out of four of them are water conservation features that are visible to the home owners/buyers, including water-conserving fixtures and faucets, water-conserving appliances and tankless water heaters. Efficient plumbing techniques are also in use by a relatively high percentage of companies.

As with the energy-conserving products and practices, all four practices are used more widely by green builders/remodelers than by others, although the difference is not statistically significant for tankless water heaters.

Water-conserving features outside the home, though, are far less commonly used.

VARIATION BY REGION Use of drought-tolerant landscaping is significantly higher in the West (37%) and South (34%) than in the Northeast (11%) or Midwest (12%). Use of drip irrigation is significantly higher in the West (44%), than in the other three regions (7% in the Northeast, 11% in the Midwest and 21% in the South). Tankless water heaters are more widely used in the Northeast (60%), South (59%) and West (58%) than in the Midwest (27%).

Most Widely Used Water-Conserving Products and Practices

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
Water-Conserving Plumbing Fixtures and Faucets	72%	81%
Water-Conserving Appliances	60%	72%
Efficient Plumbing Techniques	54%	67%
Tankless Water Heaters	51%	56%

Other Water-Conserving Products and Practices

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
Drought-Tolerant Landscaping	26%	41%
Drip Irrigation	20%	28%
Rainwater Collection and Reuse	7%	7%
Recycled Water Supplied From Utility	3%	4%

Use of Green Products and Practices

MOST WIDELY USED PRODUCTS AND PRACTICES FOR CONSERVING MATERIAL RESOURCES

Using durable materials is the most common approach to material conservation, and green builders deploy these much more frequently than the other respondents. Use of durable materials is also more widely reported by companies doing primarily single family homes than multifamily ones.

The most commonly used practice to conserve material resources is minimizing construction waste during design and construction.

VARIATION BY GREEN INVOLVEMENT Significant differences vary by level of green building involvement between builders/remodelers not doing green building, those with low green involvement (under 50% green projects), green builders/remodelers (50% to 90% green projects) and dedicated green builders/remodelers (more than 90% green projects).

- Significantly more green builders (89%) and dedicated green builders (81%) use durable materials than those who do no green projects (58%).
- Significantly more green builders (74%) and dedicated green builders (80%) minimize waste during design and construction than those doing no green projects (50%).
- Dedicated green builders (56%) use prefabricated components significantly more than those doing no green projects (44%).

Most Widely Used Products and Practices for Conserving Material Resources

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
Durable Materials	68%	84%
Minimize Construction Waste During Design and Construction	61%	78%
Prefabricated Components	50%	59%

Other Products and Practices for Conserving Material Resources

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
Recyclable or Recycled Building Materials	23%	28%
Reclaimed or Reused Building Products	20%	18%
Divert Construction Waste From Landfills	20%	28%
Rapidly Renewable Building Materials	14%	19%
Certified Sustainably Harvested Lumber	12%	18%

Use of Green Products and Practices

MOST WIDELY USED PRODUCTS AND PRACTICES TO IMPROVE INDOOR ENVIRONMENTAL QUALITY

Products that prevent air contamination are the most widely used to improve indoor environmental quality. Nearly three quarters of builders and remodelers (72%) have bathroom fans, kitchen exhausts and clothes dryers directly vent outdoors on half or more their home projects, demonstrating that this is a relatively common industry practice.

Well over half (60%) of builders and remodelers use duct insulation, indicating that this is also widely adopted.

More than half (54%) of builders/remodelers use low VOC materials.

VARIATION BY GREEN INVOLVEMENT Builders doing 50% or more green projects use all three of these products and practices more than those doing fewer green projects. However, there are no significant differences between dedicated green builders (more than 90% green projects) and the other green builders for these three.

LESS COMMONLY USED PRODUCTS AND PRACTICES

Several practices are at least moderately used in the industry, with over one third reporting use on half or more of their projects. *continued on next page*

Most Widely Used Products and Practices to Improve Indoor Environmental Quality

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/ REMODELERS DOING 50% OR MORE GREEN PROJECTS
Direct Outdoor Ventilaton of Bathroom Fans, Kitchen Exhausts and Clothes Dryers	72%	81%
Duct Insulation	60%	72%
Low VOC Materials	54%	67%

Use of Green Products and Practices

continued from previous page

All of the products and practices listed in the table at upper right fall into this category.

Fewer than 20% of all builders report use of MERV 8+ or better filtration/air cleaning systems (18%), strategies to improve acoustics (18%) and air quality monitoring systems (15%), which are not included on the table at right.

VARIATION BY LEVEL OF GREEN INVOLVEMENT About half of green builders use all the practices shown in the table at upper right, demonstrating that products and practices that improve indoor environmental quality are widely used by those with high involvement with green.

VARIATION BY REGION The table at bottom right shows the variation by region. Significant differences include:

- Respondents in the Northeast (53%) and Midwest (48%) exceed those in the South (26%) in their use of radon control measures, which aligns with EPA radon maps.
- While around 40% keep boilers, furnaces and water heaters out of conditioned spaces in the Northeast, South and West, only 21% do this in the Midwest.
- More respondents from the Midwest (42%) use increased moisture control than do those in the West (22%). Despite the same percentage reporting use, a smaller group of respondents in the Northeast prevents the difference between the Northeast and the West from being statistically significant.

Products and Practices to Improve Environmental Quality

Used on Half or More of Projects

OTHER PRODUCTS AND PRACTICES	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% OR MORE GREEN PROJECTS
Increased Moisture Control	37%	50%
Keeping Boilers/Furnaces/Water Heaters Out of Conditioned Spaces	36%	47%
Radon Control Measures	36%	48%
Humidity Monitoring	33%	43%
Increased Ventilation (Meet/Exceed ASHRAE 62.2)	28%	45%

DIFFERENCES BY REGION	NORTHEAST	MIDWEST	SOUTH	WEST
Increased Moisture Control	42%	42%	37%	22%
Keeping Boilers/Furnaces/ Water Heaters out of Conditioned Spaces	40%	21%	40%	41%
Radon Control Measures	53%	48%	26%	40%
Humidity Monitoring	35%	43%	33%	12%

Use of Green Products and Practices

USE OF RENEWABLE ENERGY SYSTEMS

Previous studies that Dodge has conducted with NAHB on green building suggest that most contractors have worked with at least some renewable energy systems, especially solar. However, this study asked them to only select the systems they use on 50% or more of their home projects, and the findings show that most builders and remodelers do not fall into this category.

- Use of solar energy and geothermal systems is about equal among all builders/remodelers.
- Only 3% report using onsite energy storage, including among green builders and dedicated green builders (more than 90% green projects).
- Wind systems were also included in the study, but are not listed in the table, since fewer than one half of 1% report using them on half of their projects.

VARIATION BY GREEN INVOLVEMENT Green builders report about 50% higher use of solar energy systems and geothermal systems, but the percentage using these systems is still well below 20%.

VARIATION BY TYPE OF COMPANY Solar energy use is more widely reported by multifamily builders/remodelers than by single family ones, with 21% of multifamily companies reporting that they use solar energy systems on at least half of their projects, compared with 8% of single family builders and 7% of single family remodelers.

Use of Renewable Energy Systems

Used on Half or More of Projects

	ALL BUILDERS/ REMODELERS	BUILDERS/REMODELERS DOING 50% TO 90% GREEN PROJECTS	BUILDERS/REMODELERS DOING MORE THAN 90% GREEN PROJECTS
Solar Energy Systems	8%	16%	12%
Geothermal Systems	9%	13%	15%
Onsite Energy Storage	3%	3%	3%

Use of Green Products and Practices

SUMMARY OF TOP GREEN PRODUCTS AND PRACTICES

The table at right lists all the products and practices used by 60% or more of the builders and remodelers on over half of their projects.

- Energy-conserving products and practices top the list, as seen in many other green building surveys.
- The only two water-conserving features to make the list, fixtures/faucets and appliances, are well-known and very visible to consumers.
- The only common indoor air quality practices are the direct ventilation of bathroom fans, kitchen exhausts and clothes dryers, and the insulation of ducts.
- Durable materials have perennially performed well in other studies, but minimizing waste during design and construction is a new entry. Its strong performance suggests that many builders and remodelers realize the need to consider waste reduction measures long before setting up recycling dumpsters on a project.

USE BY SMALL COMPANIES

In all instances where there is a statistically significant difference in the level of use of green products and practices by company size, a significantly larger percentage of small companies¹ use them on more than 50% of their projects than do large companies². This includes eight of the energy-conserving products and practices, four products or practices that improve indoor environmental quality, and one each of the water and material conservation products/practices. This is likely due to the fact that small companies doing green are more likely to do it on the majority of their projects, whereas large companies may offer some green options, but are less likely to specialize in green exclusively.

¹Small companies are defined as follows: single family or multifamily builder that annually builds 1-9 units, single family or multifamily remodeler that annually does 1-9 projects.

²Large companies are defined as follows: single family or multifamily builder that annually builds more than 50 units, single family or multifamily remodeler that annually does 25 or more projects.

Top Green Products and Practices in Use by Builders/Remodelers

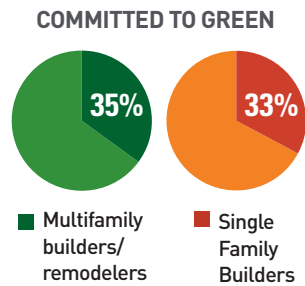
	ALL BUILDERS/ REMODELERS
LED Lighting	85%
Energy-Efficient Appliances	76%
Right-Sizing HVAC System	72%
Water-Conserving Plumbing Fixtures and Faucets	72%
Direct Outdoor Ventilation of Bathroom Fans, Kitchen Exhausts and Clothes Dryers	72%
Durable Materials	68%
Highly Efficient HVAC and/or Water Heating Equipment	67%
Insulation Exceeding Code Minimums	63%
Windows Exceeding Code-Mandated Performance	62%
Minimize Construction Waste During Design and Construction	61%
Focus on Air Tightness	60%
Water-Conserving Appliances	60%
Duct Insulation	60%

Top Findings

GREEN BUILDING MARKET ACTIVITY

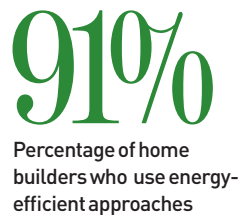
Experience with achieving energy efficiency, improving indoor environmental quality and water efficiency are common among single family home builders, but homes incorporating a full range of green building practices are less common.

- **Despite many committed green builders and remodelers, there is room for growth:** While about one third of single family builders (33%) and multi-family builders/remodelers (35%) are committed to green, with half or more of their projects built green in 2018, nearly half (42%) of single family builders and almost one third (31%) of multifamily builders do no green projects at all.



- **Lack of market demand is the top reason that companies do not do more green building:** Market factors are not the primary drivers of green homes currently, finishing far below doing the right thing or reputation in the industry, and lack of market demand is the top reason that companies are not currently doing more green building.

- **Practices promoting energy efficiency are commonly used in homes, whether they are green or not:** 91% of home builders use energy-efficient approaches, and over two thirds (69%) do so on the majority of their projects.



- **Most home builders also have experience with improving indoor environmental quality and water efficiency:** Over two thirds of home builders use these practices, although only about one third do so on a majority of their projects.



Over two-thirds of homebuilders use practices to improve air and water efficiency.

- **Green builders and remodelers more frequently use resilient features and smart home technology for energy management than those with little/no green engagement:** Resilient features are used on 50% or more of projects by 64% of green builders/remodelers, and smart home technology by 43%, while both are only used by about one third of those with low/no green engagement.



43% of green builders/remodelers use smart home tech on half or more of their projects.

Top Findings

MARKETING GREEN HOMES

The opportunity to increase consumer demand makes marketing strategies particularly important. This may include targeting messages to different types of buyers and finding the most effective ways to communicate about green.

- **Most single family builders and remodelers believe that customers gain more value from a green home than is reflected in the cost premium they pay:** Nearly all regard lower operating costs as providing more value to customers than the premium they pay for green, but over half also think customers gain value from the greater comfort/better occupant experience afforded by a green home.



84% of single family builders think lower operating costs add more value to a green home than the green cost premium customers pay.

- **Buyers seeking to upscale and those seeking to downsize are the most likely to be willing to pay a green premium for their home:** Builders believe that both of these types of buyers are influenced by lower operating costs and greater comfort/improved occupant experience. Lower operating costs are by far the most influential factor with cost-sensitive first-time buyers, while buyers with children are most likely to be influenced by the prospect of improved health and well-being.

- **Third-party verification, whether through a HERS score or through certification, is the top way that home builders demonstrate to their customers that projects that they build are green:** HERS scores are also important to multifamily builders, but their top means is website marketing. Fewer than one quarter of remodelers use any of the means in the survey to demonstrate that their projects are green to their customers.



- **Cost savings and quality are the best way to convey the impact of green features to customers:** About half of builders and remodelers rank operating efficiency, long-term utility cost savings and quality construction among the top three ways to describe green features to their customers.



Builders consider cost savings an important way to convey the impact of green features.

- **Availability of green appraisals and inclusion of green features in MLS listings could help promote awareness among consumers:** Only 11% of green home builders currently report that home appraisals frequently/always reflect the added value of a green home, and only 26% frequently/always see green features reflected in MLS listings.

11%

Builders and remodelers who see home appraisals that reflect the added value of a green home

Top Findings

DRIVERS AND OBSTACLES FOR INCREASED GREEN BUILDING

Not only is consumer demand a top driver for future green building, but builders are very influenced by consumer perceptions about cost, performance and quality. The study also revealed that the availability of affordable, high-quality green products is also a hurdle for builders and remodelers.

- **Consumer demand is the top driver for new green building, and the lack of it is a top obstacle, for single family and multifamily builders and remodelers alike:** Builders and remodelers believe that increasing consumer demand would lead to more green building activity, and that the lack of it would depress that activity.
- **The availability of affordable, high-quality green products is also a notable driver and the lack of these products is a key obstacle:** This perception is shared by builders and remodelers of single family and multifamily homes, and it reveals an opportunity for manufacturers of residential products.



The top factor influencing builders' decisions to build more green projects is consumer demand.

59%

Single family builders/remodelers who regard high priced, lower quality, limited availability of green products as a top obstacle

- **Most builders and remodelers are influenced in their decisions about their level of green engagement by how they think consumers perceive green homes:**

Consumer perceptions of cost are the most influential (including the length of time in which consumers can see their return on investment for any green premium they've paid), but over two thirds are also influenced by consumer perceptions of performance and quality. These influences, though, end up competing with each other, since most builders/remodelers believe that consumers think that green homes are expensive and that they do not have a short return on investment, but they also think that consumers do believe that green homes perform better. They are evenly split about whether consumers perceive that green homes are of higher quality, though. Influencing any of these consumer perceptions would have an impact on the level of engagement with green among green home builders and remodelers.



Builders believe that performance is one of the top factors influencing consumer decisions to invest in green homes.

Top Findings

USE OF GREEN PRODUCTS AND PRACTICES

Use of many products and practices improving energy efficiency is widespread in the home building industry, and other practices that promote water conservation, material resource conservation and improved indoor environmental quality are also quite common. Few builders, though, use renewable energy systems on the majority of their projects.

- **Products and practices that conserve energy are widely used:** Eight different products and practices, even those that consumers might not be aware of, are used by more than half of builders/remodelers on 50% or more of their projects, demonstrating that improving energy performance is a priority in most home building projects.

8 different products/practices are used on more than 50% of projects

- **Water conservation products and practices for the inside the home are widely used, but use of them outside the home is less common:** Consumer awareness of fixtures and appliances that save water may help drive the wide use of these products, especially among green builders/remodelers.

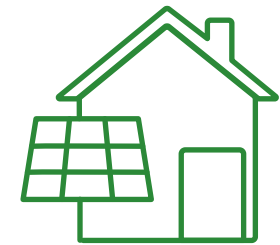


Builders widely use several products and practices that promote water conservation inside the home.

- **Despite the importance placed on healthier homes, many products and practices that improve indoor environmental quality are not widely used:** The three used the most all directly affect indoor air quality, but products and practices to improve overall environmental quality, such as those that deal with moisture, radon and acoustics, are less common.

- **Small companies use many green products and practices more extensively than do large companies:** Large companies may use green products and practices only on a limited line of homes they market as green, while smaller builders/remodelers may specialize in green homes.

- **Fewer than 10% of builders and remodelers use renewable energy systems on 50% or more of their projects:** Solar is more widely used on multifamily projects, with 21% reporting that they include it on half or more projects, but generally, most builders/remodelers are not investing in these systems on a wide scale. Even among green builders, the percentage using them at that level is 15% or less.



Among green builders the percentage using renewable energy is 15% or less.

Methodology

The research findings in this report are based on four online surveys of the US single family and multifamily home builders and remodelers. Four short surveys were conducted rather than one long one to increase participation. To encourage an increased and unbiased response, the surveys were also not identified as green building surveys in the invitation to participate.

Each survey was developed to gather data about a specific topic:

- Market activity (types of homes being built)
- Products and practices (green products going into home construction, regardless if the home was considered green or not)
- Marketing practices (how builders market features considered green to potential buyers)
- Drivers and obstacles (what supports and inhibits green features in new homes)

The surveys were based on the previous green building surveys, dating back to 2011. When developing the new surveys, an emphasis was placed on reaching all home builders (regardless of green building activity) to develop a more accurate estimate of the extent of green home building in the US. These surveys were also designed to be easily repeatable in the future and to establish new baselines for future comparisons of covered topics. Some data is comparable to previous studies, and those comparisons are captured in this analysis, but many questions were altered to make them easier to answer and to develop a more current vernacular for future research.

The respondent sample came from the National Association of Home Builders' (NAHB) member database. Firms of all sizes who did work in the US during 2018 were included in this sample. Respondents were allowed to participate in as many of the four surveys for which they qualified. Surveys were conducted one at a time, and each had a fielding period of two weeks. The surveys were conducted from September through November 2019.

In total, 1,163 unique respondents completed a total of 2,000 surveys. Response rates to each survey are as follows:

- Market activity survey: 459 completes
- Products and practices survey: 538 completes
- Marketing practices survey: 497 completes
- Drivers and obstacles survey: 506 completes

These response rates allow for in-depth analysis among different demographic groups (e.g., region, and green building level) and provide for national representation of findings.

Definition of green building used in each survey:

A green home incorporates strategies in design and construction that increase energy, water and resource efficiency, indoor environmental quality and minimize environmental impacts on the site; and/or is certified by a third-party to the National Green Building Standard, LEED for Homes or any other green rating system.

Contacts and Resources

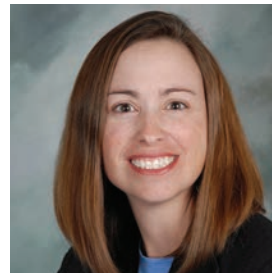
DD&A EDITORIAL TEAM

Stephen A. Jones leads DD&A's Industry Insights Research division and is the primary author of this report. He is active in numerous industry organizations and frequently speaks at industry events around the world. Before DD&A, Jones was a vice president with Primavera Systems (now part of Oracle). Prior to that, he was principal and a Board of Directors member with Burt Hill, a major A/E firm (now Stantec). He holds a BA from Johns Hopkins and an MBA from Wharton. steve.jones@construction.com

Donna Laquidara-Carr currently provides editorial direction, analysis and content to DD&A's SmartMarket Reports. Prior to this position, she worked for nearly 20 years with DD&A's Dodge editorial team, where she gained detailed insight into the construction industry. She holds a Ph.D. from Tulane University, an MA from Boston University and a BA from Middlebury College. donna.laquidara@construction.com



Stephen A. Jones
Senior Director
Industry Insights
Research



Donna Laquidara-Carr
Ph.D., LEED AP
Research Director
Industry Insights

ADDITIONAL RESOURCES

PREMIER PARTNER



The National Association of Home Builders is a Washington-based trade association representing more than 140,000 members involved in home building, remodeling, multifamily construction, property management, subcontracting, design, housing finance, building product manufacturing, and other aspects of residential and light commercial construction. NAHB is affiliated with 700 state and local home builders associations around the country. NAHB's builder members will construct about 80 percent of the new housing units projected for this year.
National Association of Home Builders www.nahb.org

OTHER RESOURCES

Air Conditioning Contractors of America www.acca.org

Appraisal Institute www.appraisalinstitute.org

ASHRAE www.ashrae.org

Database of State Initiatives for Renewables & Efficiency
www.dsireusa.org

Energy Star www.energystar.gov

National Association of Realtors www.nar.realtor

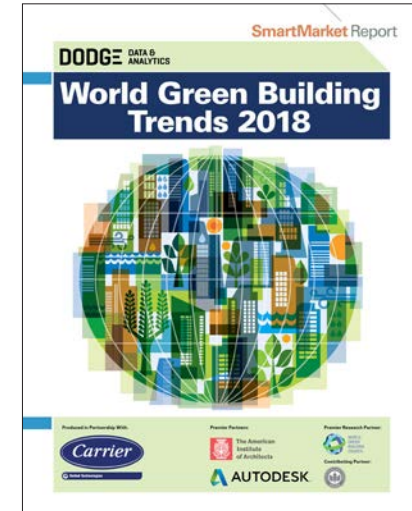
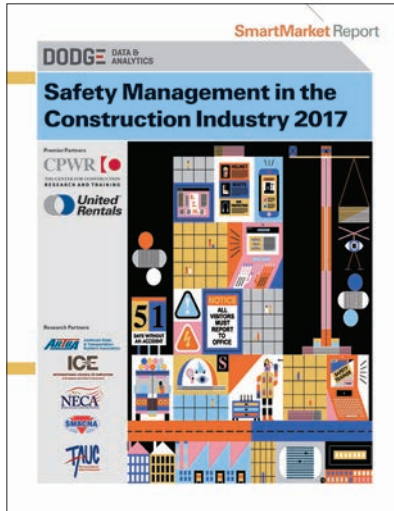
Residential Energy Services Network www.resnet.us

US Department of Energy www.energy.gov

WaterSense www.epa.gov/watersense



Dodge Data & Analytics: Main Website: www.construction.com **Dodge Construction Central:** www.construction.com/products
Market & Competitive Intelligence: www.construction.com/products/construction-market-data **Sweets:** www.construction.com/sweets
SmartMarket Reports: www.construction.com/toolkit/reports



Get Smart About the Latest Trends.

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