

**Residential Green Building:
Identifying Latent Demand and Key Drivers
for Sector Growth**

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Master's Project

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EXECUTIVE SUMMARY

The residential green building movement is at an exciting moment in its development from a niche market to a more mainstream market segment. According to some predictions, in 2007, more than half of small and large home builders will be building at least 15% of their homes to a local, regional, or national green standard. With a variety of major firm- and market-level drivers of the green residential market, home builders and developers must thoroughly understand the characteristics and relative strengths of the green homes market within their operating locales.

The purpose of this master's project is to investigate and advance the foremost thinking in the residential green building industry. The project's objective is to develop a strategic Market Engagement Framework (MEF) for examining a real estate market, so that a developer considering a local project can gauge consumer demand, understand the existing landscape, form partnerships for green building, and devise a marketing and sales strategy appropriate to the locale. The MEF contains two fundamental components: Analysis and Strategy.

A building market is most ripe for increases in green building market penetration when numerous stakeholders push for those increases together. The three primary elements critical for growing a green homes market are (1) consumers, (2) industry (both for profit and non-profit organizations), and (3) government. A developer intending to compete in the residential green building space must have a comprehensive strategy designed to analyze and exploit the elements specific to the potential development's location.

To gain a comprehensive understanding of the marketplace and devise appropriate entry and marketing strategies, builders and developers must investigate all three of the aforementioned elements--consumers, industry, and government--in conjunction with the resource and economic pressures influencing the overall landscape. This project develops and presents the Market Metrics Lens (MML) as an evaluative tool to help confront the complexity that this investigation necessarily entails. By following a relatively simple prescriptive process, salient characteristics for each market element are identified and included as metrics in the MML. Once completed, this MML is able to identify strengths and weaknesses in a given market and in comparing one location to another. Furthermore, it helps identify specific partnership and marketing strategies to raise overall awareness and advance the industry.

The MML was piloted in four different geographic locations: Los Angeles/southern California; Houston/Texas; Miami/South Florida; and Newark/northern New Jersey. In addition, four other markets were reviewed to add robustness to the comparison pool: Denver, Atlanta, Indianapolis, and Boston. Of the four focus municipalities, Los Angeles stands out as the strongest overall in its relative strength in all three key elements of a residential green building market. While the consumer and industry elements of Miami's

green residential market is relatively weak, the government element is relatively strong and growing. The industry element outside of the city, including a strong residential green building program and the support of a leading builder, is relatively strong. The consumer element of the Newark green residential market is relatively strong, while the government support element is moderate and the industry element is relatively weak. Other towns in northern New Jersey and the state government are making strong progress in green residential support. While Houston has a relatively strong industry element, it ranked weakest of the four focus municipalities in government and consumer elements.

The “strategy” portion of the Market Engagement Framework includes two important aspects: (1) forging partnerships and alliances to help advance the overall industry and raise consumer awareness and (2) targeting purchasers of residential green homes through a focused sales and marketing effort. With the results of the MML, this project proposes specific strategies for partnership, marketing, and sales in each of the four focus geographies, as well as develops a number of green homes strategy best practices, including 12 techniques for selling green homes.

While the residential green building market is rapidly growing and maturing, much remains to be understood about the dynamics of key market elements, the most likely buyer characteristics and preferences, and the most effective marketing and sales strategies. The MEF and MML presented in this project can help builders, developers, researchers, and other green residential stakeholders better understand and strategize for engagement in particular geographic markets.

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This project would not have been possible without the generous time and valuable insights of the green residential industry players and experts interviewed by the authors. Appendix I includes a full list of interviewees, and the authors are profoundly grateful for their willingness to share their expertise with the project.

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I. OVERVIEW AND BACKGROUND

PURPOSE AND OBJECTIVES

The purpose of this master's project is to investigate and advance the foremost thinking in the residential green building industry. The project's objective is to develop a strategic Market Engagement Framework (MEF) for examining a real estate market, so that a developer considering a local project can gauge consumer demand, understand the existing landscape, form partnerships for green building, and devise a marketing and sales strategy appropriate to the locale. This MEF is designed to serve the interests of Cherokee Investment Partners, a national brownfield redevelopment company, in exploring green building opportunities.

DESCRIPTION OF THE CHALLENGE

For the Industry

Residential green building developers and home builders have traditionally entered markets with little concrete information and understanding of the true nature of consumer demand for green homes. This is attributable largely to the difficulty in quantifying demand for a relatively new product that is foreign to or misunderstood by most traditional homebuyers. Nonetheless, the proactive efforts of industry leaders to deliver products to market they believe are inherently desirable often tap into latent demand for green homes. Industry players must understand and effectively engage this growing market, since many experts, including McGraw-Hill Construction and the National Association of Home Builders (NAHB), expect that 2007 will be a tipping point for green building becoming a mainstream movement in the residential market.¹

Industry players interested in augmenting their green building portfolios and capitalizing on new opportunities recognize a need for a more rigorous understanding of the characteristics of demand and other critical elements of the residential green building market. Analysis of this kind will augment profitability of existing pipe-line projects and can identify opportunities in areas where competitors and the rest of the industry may be lagging.

For Cherokee Investment Partners

Cherokee Investment Partners holds the potential to tap into the burgeoning and powerful market that is the modern-day green homes landscape. By becoming attuned to the subtleties of consumer demand for green products, appropriately partnering with industry and government players, and anticipating related trends in housing markets, Cherokee has the ability to push the green building industry farther and faster towards sustainability while enhancing its own financial returns. Cherokee is ideally situated in the development world to work across localized boundaries to form partnerships with builders, architects, urban planners, municipalities, and non-profits to coordinate effective green building campaigns.

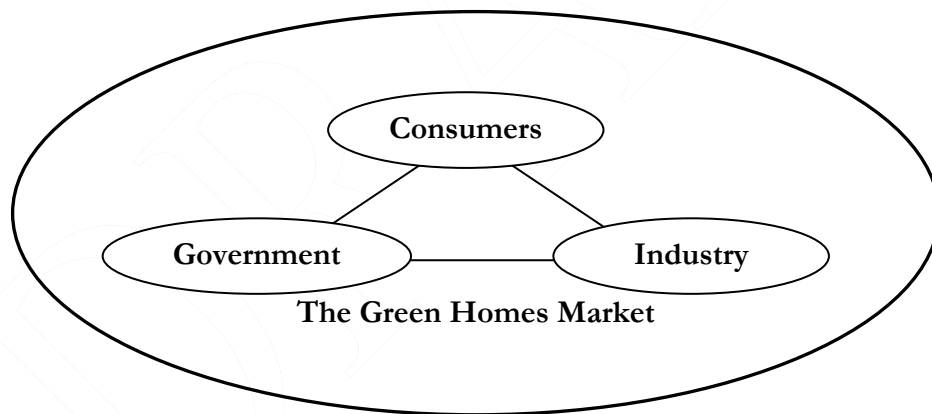
PROPOSED SOLUTION

To address these industry- and firm-specific challenges, this project provides an evaluative tool for both analysis and strategy development. We call this tool the Market Engagement Framework (MEF). The MEF enables an industry player who seeks to extend its presence in the green home market to quickly and relatively easily evaluate the landscape, identify gaps and leverage points that can be filled and/or exploited, and develop sales and marketing strategies appropriate to specific locales.

A Robust Green Homes Market: Conceptual Overview

A building market is most ripe for increases in green building market penetration when numerous stakeholders are all pushing for those increases together. The three primary elements critical for growing a green homes market are (1) consumers, (2) industry (both for profit and non-profit organizations), and (3) government. See Figure 1 for a representation of the green homes market.

Figure 1. Elements of the Green Homes Market

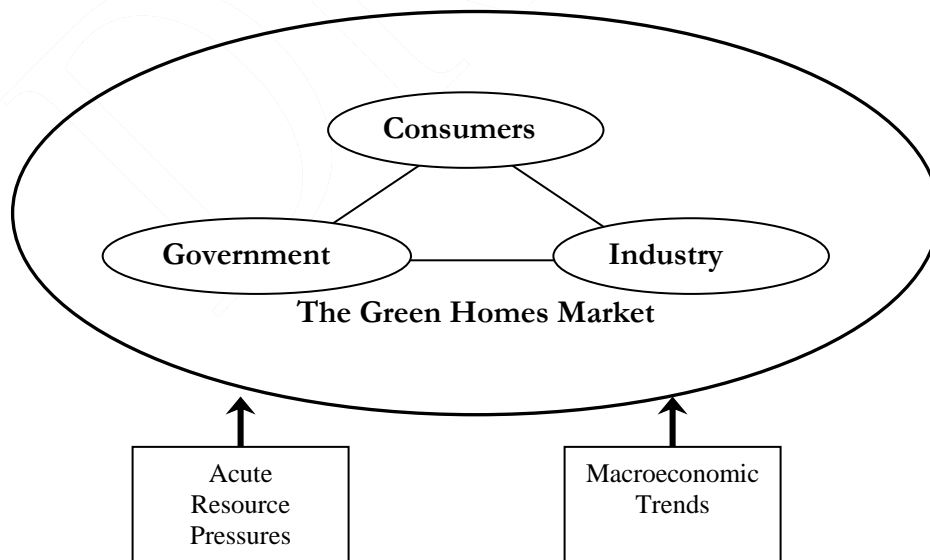


In a perfectly robust green homes market, there would be a large number of homebuyers who are well versed in the attributes of green homes, receptive to the green homes value-proposition, and discerning of the many possible green home products available. Similarly, there would be a strong local industry presence that would consist of developers, builders, sub-contractors, and other professionals familiar with the methods for building, marketing, and selling green homes. A local green homes organization and certification program would be active. Lastly, a powerful government entity would be present with offices, resources, and policies focused on supporting green building and sustainable development. These three elements working in concert would comprise a robust and active green homes market.

Conversely, in a nascent market, green homes have yet to make serious inroads. In such a market, several factors could have tempered green home penetration. For instance, consumer demand may be high, whereas industry capability and/or government support are underdeveloped in relation to this latent demand. Alternatively, industry and government could be actively promoting the residential green building, but a strong consumer preference has simply not yet materialized. Even with these characteristics, the potential exists for a market to evolve into one wherein all three elements are strong. While advances in the green homes market can be made with only two of these elements or with only minimal interest from each, green homes penetration will never be as rapid or as complete as when all three work together in a driven fashion. Furthermore, the consumer element is critical to the success of any developing market.

Also affecting market dynamics in any given location are a variety of significant external pressures. These we have organized into two distinct categories: acute resource pressures and macroeconomic trends. Acute resource pressures can include water-scarcity, traffic congestion, land-density constraints, air-pollution, and energy capacity and price. These pressures will affect consumer preferences, industry innovation, media attention, and the regulatory environment. Macroeconomic trends are factors such as fluctuating costs of home ownership, job growth rates, interest rates, and migration patterns into or out of the area. These factors are known to impact the overall housing market, of which the green homes market is a part. Together with the three key elements (consumers, industry, and government), these pressures comprise the overall green homes market landscape depicted in Figure 2.

Figure 2. The Green Homes Market Landscape



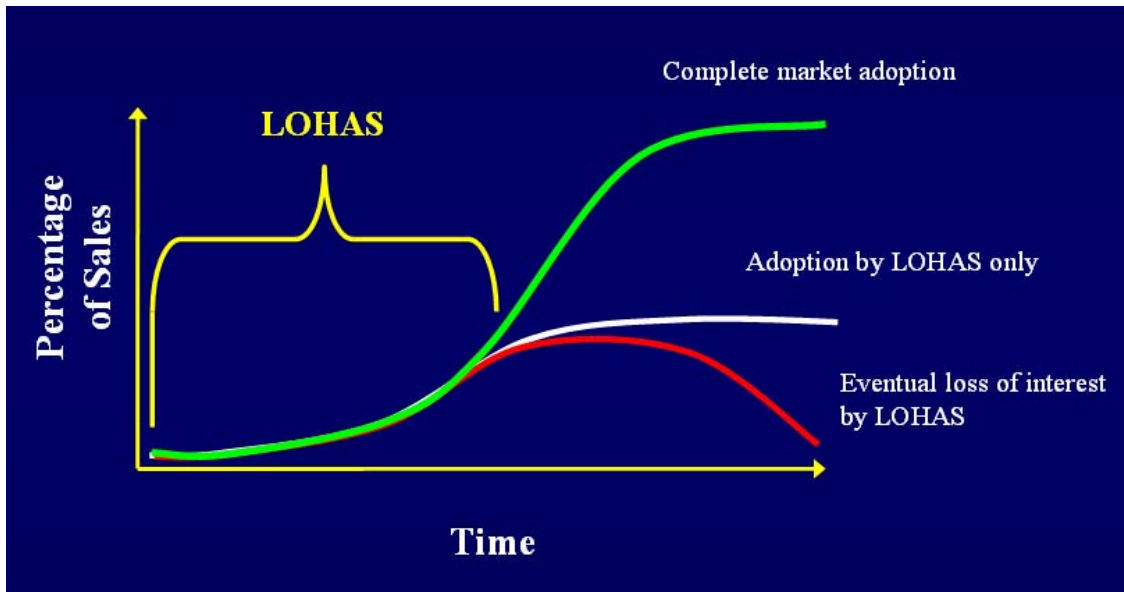
Often, one or two of these elements tends to move faster than the others; it is not uncommon for one to take the lead before the others catch up. Usually, within one element a specific organization or group of individuals is at the forefront of the green residential movement. As Gordon Cooke, a green building marketing consultant with 25 years of experience, notes, “in any one area you can identify the person or the organization that made the difference.”²

Market Adoption Characteristics

Three additional concepts are integral to a fundamental understanding of the green homes market. First, green homes can be sold to any consumer via benefits-based selling (e.g. all homebuyers want a healthy living environment), but some buyers are willing to pay more or have a faster absorption rate for these benefits. Second, potential green homebuyers are motivated by personal interests when deciding on which home to buy. These include health effects on inhabitants, durability and ease of maintenance, environmental friendliness, and energy efficiency, in addition to those perceived to be standard for conventional homes (such as location, price, and size). Third, each segmented geographically-based real estate market has a different mix of homebuyers with a variety of interests and demands. Based on this, each market has moved to a different point along the green homes adoption curve.

The adoption curve for green homes is very similar in nature to the adoption curves of other major new products or technologies. As described in Everett Rogers’ seminal book, *Diffusion of Innovations*, “innovators” and then “early adopters” tend to drive the adoption of a new technology or product in the early stages.³ For green homes, these two categories are composed largely of a market segment the Natural Marketing Institute (NMI) calls Lifestyles of Health and Sustainability (LOHAS) consumers. If the LOHAS consumers were to remain the primary purchaser of green homes, then the adoption curve would largely follow the white line in Figure 3, representing a plateau of adoption at a very modest market penetration. If the green homes market penetration continues to grow rapidly, as real estate experts such as McGraw-Hill Construction predict, then green homes will become a product of choice for the “early majority” buyer, and market penetration would follow the green curve. This transition is occurring in markets such as Denver, where green home penetration has now surpassed 20%. Lastly, if green homes were perceived to be a temporary fad, then the adoption curve would follow the red line, with market penetration deteriorating as LOHAS consumers move their purchasing to other products. Virtually all indications show that green homes are at a tipping point where most major markets will have significant availability of product over the next several years, and some leading markets will be moving further along the adoption curve to capture “early majority” buyers. The challenge for the developer and builder is to identify the drivers of growth in green homes in particular markets, and then construct partnership, marketing, and sales strategies to most effectively tap into this growing market segment.

Figure 3. Green Homes Adoption Concept: LOHAS Driving the Market

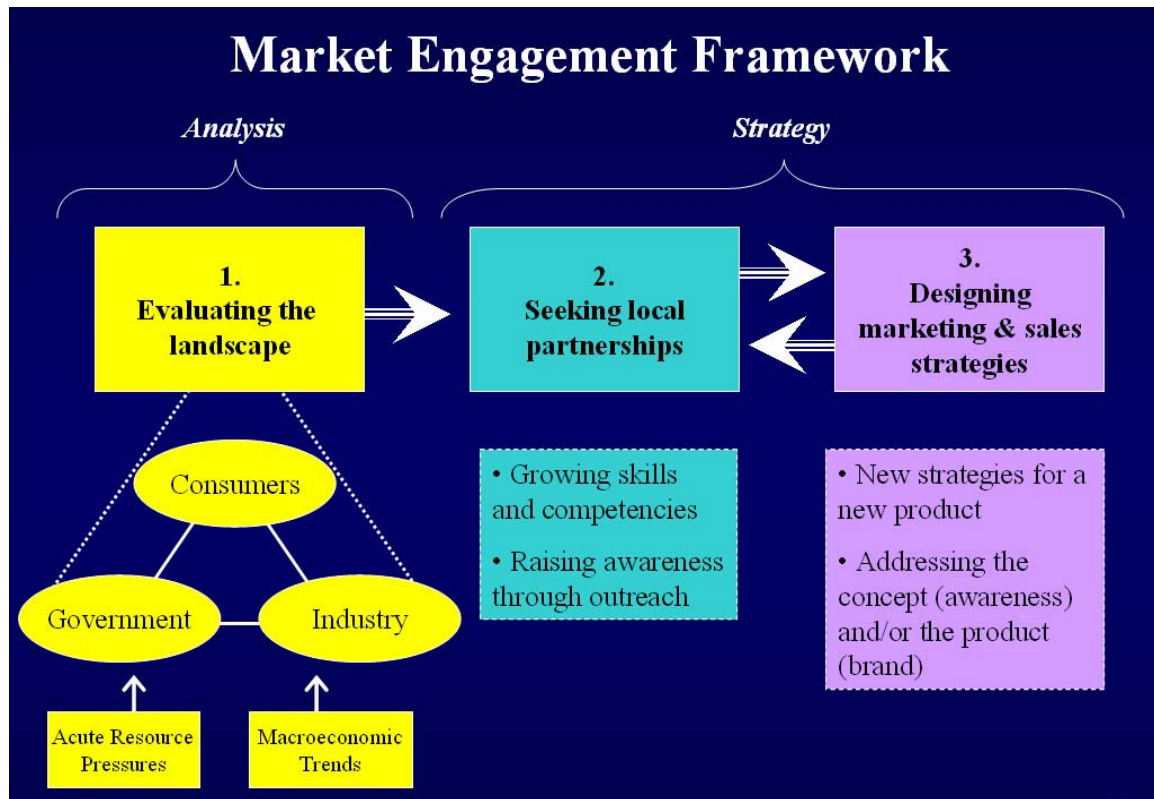


A developer intending to compete in the residential green building space must have a comprehensive strategy designed to analyze and exploit the elements specific to the potential development's location. In keeping with that goal, this project provides the Market Engagement Framework (MEF) to guide developers in gauging the relative strengths of localized elements and to guide those same developers in forming marketing and sales strategies tailored to immediate and long-term needs of their developments. This process (and thereby, the MEF) is divided into two sections: Analysis and Strategy. (See Figure 4 below.)

Analysis: To properly analyze the three elements of the green homes market, developers must know where to look and how to read the potential proxies of the existing elements. This process is covered more fully in Section III of this report.

Strategy: Beyond analyzing the existing elements, developers must be able to sell homes that are appropriate to the local market's demands. The marketing and selling strategies that developers form must be directly linked to the results of their analysis. Effectively gaining a widespread understanding of the benefits of green homes is critical to successful market penetration, and partnering with relevant government and industry programs is often a critical step in green residential market engagement. This process is covered more fully in Sections VI and VII of this report.

Figure 4: The Market Engagement Framework



Research Methodology

The process for this master's project involved seven critical steps:

- A. Develop assumptions upon which research design and approach are based.
- B. Perform a literature review to investigate pre-existing studies and research relating to residential green home markets.
- C. Identify potential proxies and indicators representing the primary elements of the green homes market.
- D. Interview green residential experts for feedback and perspective on potential proxies, indicators, and best practices of marketing green residential.
- E. Apply revised proxies to target and comparison geographies and collect other relevant and available data.
- F. Compile and synthesize findings to develop strategic frameworks (Market Engagement Framework and Market Metrics Lens) and recommendations based on best practices.
- G. Review results with selected green homes experts (subset of those interviewed in step D).

Two key aspects of the process are discussed below.

Interviewing Stakeholders. Our team interviewed 35 experts from around the country in the business, non-profit, and government sectors who have extensive experience in building, marketing, and selling green homes. Many also have experience with marketing campaigns to raise awareness of green building and/or to position specific brands of green homes as the best consumer choice. To connect directly with current professional thought leaders, we also attended the 2007 West Coast Green Conference and the Greenbuild 2007 Conference. See Appendix I for a complete list of interviewees. Experts were selected to be re-interviewed based on their expertise in the subject matter and because they represented a mix of market specialists, developers, and builders. Reengaging experts subsequent to the development of core ideas and frameworks aided greatly in the validation of the findings. Those chosen to be re-interviewed are also listed in Appendix I.

Literature Review. To stay connected to this rapidly evolving industry, our team reviewed not only academic research, but also professional and industry journals, conference papers and presentations, and websites and program documentation that highlight the current thinking on green building in the working world. See Appendix II for the authors' recommended green residential market literature.

II. CURRENT STATE OF THE GREEN BUILDING MARKET

The green building industry is growing rapidly and has gained a great deal of attention in both mainstream media and throughout the entire building design and construction field. Indeed, as far back as 2003, *Building Design & Construction* magazine was calling green building “the most vibrant and powerful force to impact the building design and construction field in more than a decade.”⁴ Three years later, the same publication states: “What started out as a charismatic environmental crusade has matured into an established sector of the U.S. construction industry.”⁵

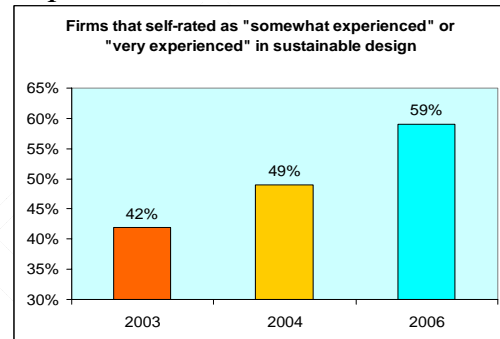
The green building movement in the U.S. is nearing what many experts are calling a tipping point, where the majority of residential and commercial builders will be participating in green building projects to a significant degree (in which more than 15% of their projects will be green). The non-residential building market, in particular, has shown significant growth in green building over the last several years. In 2004, non-residential green building accounted for roughly 2% of the U.S. market, resulting in a \$3.3 billion component of the overall industry. By 2010, this market share is predicted to grow to between 5 and 10% of the new non-residential market, representing a \$10-20 billion industry. “We can safely say that green building is no longer a fad, but an increasingly important new way of doing business,” states Harvey M. Bernstein, Vice President of Industry Analytics and Alliances at McGraw-Hill Construction.⁶ A 2005 McGraw-Hill Construction survey found that 40% of the builders, architects, engineers, and designers surveyed report “more than moderate” involvement with green building. More than 85% of the architect, engineers, and contractors

report participation in green building activities. More than 31% of all builders surveyed report more than moderate involvement in green building.⁷

These findings of significant attention and growth in green building are supported by other major surveys of the building industry. A comprehensive internet survey of 10,000 subscribers of *Building Design & Construction* magazine, including architects, contractors, engineers, building owners, and developers was conducted in August 2006.⁸ Of the 872 people who responded and completed the survey:

- A majority of respondents (59%) say that their firms had become either “somewhat experienced” (45%) or “very experienced” (14%) in sustainable projects. This is a statistically significant gain over 2004 (49%) and 2003 (42%). Those who say their firms had “little or no interest in sustainable design” had dropped to only 2%.⁹

Figure 5: Growth in Industry Experience



- A majority of respondents (53%) state that their firms had “made an effort to green-build at least one project,” while nearly a quarter of respondents (24%) report that their firms had attempted to certify a green project. Twenty percent say their firms had in fact certified at least one project—up significantly from 13% in 2004 and 11% in 2003.¹⁰

One strong measure of the recent and rapid growth in the green building market is the growth in Leadership in Energy and Environmental Design (LEED) registered and certified buildings. LEED is a green building certification program developed and run by the United States Green Building Council (USGBC). The value of new LEED-New Construction (LEED-NC) registered projects has grown dramatically each year, from roughly \$792 million in new projects in 2000, to roughly \$10 billion in new projects in 2006. The growth in square footage of LEED registered projects is also impressive. In 2002, there was roughly 80 million square feet of LEED registered space.¹¹ As of February 2007, USGBC estimates that over 829 million square feet is certified or registered.¹²

Growth in USBGC involvement has also been profound. From 2000-2007, member companies and organizations grew from under 500 to over 7,675; workshop attendees grew from under 600 to over 43,800; and LEED-accredited professionals grew from 500 to over 35,500.¹³

TRENDS AND FUTURE PROJECTIONS FOR THE RESIDENTIAL GREEN BUILDING MARKET

The residential green building market is also rapidly maturing from a boutique niche in select parts of the country to a mainstream option for homebuyers. A 2006 McGraw-Hill

Construction study projects that by the end of 2007, 60% and 59% of all small and large homebuilders, respectively, will undertake green construction projects, accounting for at least 15% of their production. Over 30% of home builders currently report “more than moderate involvement with green building.”¹⁴ McGraw-Hill also suggests that the residential green building market is expected to grow to between \$19 billion and \$38 billion by the year 2010, up from \$7.2 billion in 2005. McGraw-Hill defines green homes as ones that meet the “bronze” threshold of the NAHB Model Green Building Guidelines, and that the predictions are based on self-reported survey data.¹⁵ “The ‘green homes’ of today will become the standard homes of tomorrow,” states Harvey M. Bernstein, Vice President, Industry Analytics and Alliances, McGraw-Hill Construction.¹⁶ David Ellis, President of the Greater Atlanta Home Builders Association, agrees: “Ten years from now, we’re just going to call it how we build houses.”¹⁷

Strong signs from many sources indicate that the growth of residential green building is becoming mainstream. Green building expert Jerry Yudelson predicts that the total number of LEED registered projects will increase more than four-fold through the end of the decade, continuing to increase at more than 30% per year. Yudelson states: “This means that homeowners and homebuyers everywhere will continue to see more information about green buildings in their cities and towns; we believe this will translate into significantly increased activity in the home energy markets, both for new homes and conservation retrofits.”¹⁸

Furthermore, builders themselves are increasingly appreciating that green residential development will not be a passing fad but rather a major and long-term transformation in the home building market. David W. Milner, Vice President of Haven Properties (an Energy Star award winning builder that constructs 100 to 130 homes per year)¹⁹ in Alpharetta, Georgia, recognizes that, “In the Southeast, green building is certainly an emerging market that is coming into its own. I feel like those who embrace it earliest are the ones that are going to establish themselves in the marketplace as builders that are leading edge. Don’t wait until it’s forced upon you. Begin to investigate how you can get into a program.”²⁰

Energy Star, the most widely recognized environmental certification program and product label in the country, is also a powerful indicator of green homes demand. Energy Star is a U.S. Environmental Protection Agency certification program for products that meet strict energy efficiency guidelines.²¹ In 2005, Energy Star achieved an average national market presence of nearly 10% in the new homes sector, with 149,568 new Energy Star site-built, single-family homes built. Through 2006, more than 525,000 Energy Star qualified new homes have been built nationwide.²² From a sales value perspective, residential Energy Star building is an impressive market segment. According to the Natural Marketing Institute, the value of Energy Star-certified homes sold in 2005 was \$26 billion.²³

While other nationwide green home standards, including LEED for Homes and NAHB’s Model Green Home Building Guidelines, have recently entered the pilot and distribution phases, local and regional green home programs have been around for years.

Since 1991, when Austin's green home program was launched, over 62,000 homes have been built according to a green building standard nationwide.²⁴ The NAHB Research Center reports that at least 14,589 homes were built to a local or regional green building standard in 2004. See Appendix III for a graph of regionally and locally certified green homes by state.

THE BENEFITS OF BUILDING GREEN

Willingness to Pay and Absorption Rates

Strong indications exist that homebuyers in markets across the country are increasingly willing to pay premiums for green homes. Cahners Residential Group, American LIVES, Christopherson Homes, and others have all contributed to this body of research. The 2001 Cahners survey reveals that 96% of homebuyers claim they are willing to pay extra for green features, and 68% would be willing to pay \$2,500 to \$5,000 extra. Twenty percent would pay up to \$10,000 for green upgrades.²⁵ A 2005 Christopherson Homes study finds that roughly half of its survey respondents are willing to pay over \$100 a month in additional mortgage payment for a green home, equating to an additional \$15,821 in purchase price, assuming a 30-year loan and a 6.5% APR.²⁶ An October 2005 survey by American LIVES of homebuyers in the Terramor section of the Ladera Ranch development in Orange County, California, finds that 23% of respondents are willing to pay over \$100 a month in additional mortgage payment for green home features they think are important.²⁷ Interestingly, this finding is identical to a larger 2004 survey of recent homebuyers in the northern California, Denver, Salt Lake City, and San Diego.²⁸

Although the marketplace acknowledges this significant evidence of buyer willingness to pay more for green homes, builder appreciation of buyer preferences is lagging. The McGraw-Hill study finds that only a slim majority of responding builders (56%) claim that buyers are willing to pay more for a green home,²⁹ and earlier surveys by *Professional Builder* from 2001-2003 finds that, "On average, over three surveys, consumers have said they would ante up \$3,569 extra for green features. On average, builders have said buyers will pay \$2,474."³⁰

Nonetheless, green residential developers have found that such buyer preferences have often turned into actual premiums and other benefits in their developments. As green building expert Steve Kellenberg of EDAW has noted, "Several pioneering green communities have shown an increase in base values: a 10% green premium is possible, although it is often hard to extricate that from the value added by other project amenities."³¹ Below are some recent project testimonials:

The Solaire green condominium building in Battery Park, New York City, is attaining 10-15% rent premiums based on green demand. Solaire Leasing Manager Lydia Haran says the marketing strategy changed over time: "When we started, we were marketing a stunning residential building with five-star services, unsurpassed views, and condo quality finishes. The green features were an added incentive." Haran

continues, “But we learned from the leasing process that the green features actually were primary and the other factors secondary, and that there was a pent-up demand for green luxury high-rises. We leased 293 units within five months.” According to Haran, those units achieved a 10% premium in rents, which has risen to 15% since the building opened last year.³²

Overall interest for Terramor Village homes (built green in southern California) was 32% higher; and absorption was 5% greater than homes in neighboring Ladera villages that lacked Terramor’s green elements. Terramor Village homebuilders also enjoyed a 5-10% price premium over homes in Ladera Ranch.³³

Green residential developers have also found protection from the down market due to building green:

Despite the lackluster local economy, the 15-story Henry condominium building, designed by Portland GBD Architects, sold out nine months ahead of construction, and the developers raised the price five times. Dennis Wilde, Senior Project Manager with developer Gerding Edlen, cautions that while the buying public may favor an environmentally sensitive product--especially in the Pacific Northwest--they are not necessarily willing to pay more for it. Still, in a competitive market, lower utility bills and the promise of a healthier indoor environment give the developer a way to differentiate the product in the marketplace, Wilde says.³⁴

“Green homes are a little more isolated from a downturn,” says Chris Bartle, President of The Evergreen Group, a San Francisco green brokerage company. “Our market has softened too, but not enough to really make a difference.”³⁵

Expert Testimonials on Other Green Building Benefits

Reduced Warranty Costs and Reduced Call-backs

According to David W. Milner, Vice President of Haven Properties in Alpharetta, Georgia: “Between 2003 and 2004, our warranty costs went down by about 11%. . . . And we directly attribute that to . . . the green building program.”³⁶

Dennis Creech, Executive Director of Southface Institute, which developed the EarthCraft green homes certification, says: “If we can reduce the number of call-backs . . . that’s money in [builders’] pockets.”³⁷

Attracting New Consumers

“Green communities bring in homebuyers who typically buy only in the resale market,” says Brooke Warrick, President of American LIVES, a consumer-focused market research firm, “so developers and builders are creating a new market for themselves.”³⁸

Entitlement Process

Steve Kellenberg notes, “Applying Green measures can definitely win over communities and speed the entitlement process. Voluntarily restoring wetlands and other ecological areas, encouraging alternatives to automobile use, and creating open space for community use go a long way towards building support and reducing legal delays.”³⁹

According to Landon Christopherson, a project manager with the small developer Landwell Company in Nevada, municipal support is critical. “[City officials] are eager to bring forth a true green development--one that embraces best development practices that will stand the test of time.”⁴⁰

Resale Value

According to the National Resource Energy Laboratory (NREL), SheaHomes’ high performance homes in San Diego, experienced a mean dollar gain of 55.4% for a mean ownership length of 22.5 months. Comparison [non-green] homes experienced a mean dollar gain of 44.7% for a mean ownership length of 28.1 months. The mean dollar gain per month owned was \$14,500 for SheaHomes and \$9,300 for comparison homes.⁴¹

Increased Publicity and Improved Reputation

By its own contractor’s estimate, SheaHomes received, without cost, print and broadcast media coverage on the San Angelo and Tiempo developments that approximated one million dollars in publicity value between January and August 2001 alone. The coverage included San Diego television evening news, local newspapers, and trade journals.⁴²

Amy Bolten, of Christopherson Homes in California, reported that the company’s green reputation was a significant factor in attracting a land seller in Marin County to approach the company to arrange a sale of highly valuable land for development, rather than putting it up on the open market. Going green has created goodwill with municipalities and environmental groups in addition to opening doors such as better access to properties.⁴³

Alleviating the Cost Burden Perception

The perception of increased costs is one of the most significant impediments to builders who are considering adopting green building. After a thorough review of the current research and studies, McGraw-Hill finds that “most literature suggests green building can be achieved for comparable costs to standard construction, with better up-front planning and/or energy or other cost savings as a result of green construction.”⁴⁴ Green home builders have also found that actual cost premiums in building green are regularly less than originally perceived. According to the Urban Land Institute, “Practitioners estimate that

using green materials tends to cost between 3-4% more than using conventional construction materials.”⁴⁵ Most articles and industry professionals agree that green building cost premiums are in accordance with the Urban Land Institute’s estimates. Green construction can be successfully completed at zero extra cost with careful design and a systematic incorporation of many of the green elements early in the development process.⁴⁶ Conversely, piecemeal attempts at green construction can result in costs exceeding the typical 2-5%. Although the cost/benefit issue is central to any discussion about green construction, it falls largely outside the scope of this project.

THE EMERGENCE AND GROWTH OF RESIDENTIAL GREEN BUILDINGS: EXTERNAL DRIVERS

Energy and Global Warming

Continuing increases in energy prices combined with tax incentives will significantly effect market growth. According to the U.S. Department of Energy, the average American family spends roughly \$1,300 a year on home energy, thus presenting opportunities for cost savings.⁴⁷ Green building expert Jerry Yudelson highlights the significance of the combined impact of increasing prices and tax incentives:

The new federal energy bill (Energy Policy and Conservation Act of 2005), with increased incentives for residential solar electric and water heating systems, along with prolonged oil prices above \$60 per barrel, and gas prices above \$8 to \$10 per million Btu (\$0.80 to \$1.00 per therm), have changed the psychology of the consumer and the business for the first time in a generation, since the oil price shocks of the late 1970s. New credits of up to \$2,000 per unit for homebuilders should spur more investment in energy efficiency homes.⁴⁸

Increased attention to global warming and climate change is also driving attention to the impacts of the built environment and the opportunities that green buildings present to mitigate them. Green building experts, including Greg Kats of Capital E, believe this issue will become the dominant driver of residential green building.⁴⁹ Over the last few years there has been a noticeable increase in popular press coverage of global warming, including major articles in *Time* magazine, *USA Today*, *The Wall Street Journal*, and *The New York Times*. The release of the Sterns Report and the popularity of the global warming documentary, “An Inconvenient Truth,” have raised awareness of climate change in the U.S. to an all-time high. Attention to the issue is spreading rapidly across the country, even in traditionally less receptive areas like Texas.⁵⁰ Major policies coming out of California and the Northeast, in addition to initiatives from associations, such as the U.S. Conference of Mayors, are building public momentum toward reducing global warming emissions. This attention is boosting the appeal of and interest in green homes, particularly in markets in which global warming is well understood.⁵¹

Urbanization Trends

The movement of populations back into cities is also a driving trend behind residential green building growth. The re-urbanization of America aligns well with both smart growth and green building trends. Jerry Yudelson captures the significance of the urbanization movement as it pertains to the growth of green residential building:

The continued movement of Boomers back into urban cores will bring more discriminating buyers to condo developments, requiring builders to have a green point of differentiation. . . . The “Rise of the Creative Class,” first chronicled by Richard Florida in 2002, has the potential to change American demographic geographic patterns in as dramatic a way as the rise of Levittown and the suburban lifestyle did after World War II, a pattern that has begun to reverse itself dramatically. People want connectedness, they want the amenities of urban living, and they don’t want to commute for hours each day for the privilege of mowing a patch of grass on Saturdays. This trend will by itself lead to more energy efficient homes and remodels, with a heavy focus on already existing urban landscapes. A rising trend for boomers and the new creative class is to re-locate into the top 30 major metropolitan areas, where there is a more sophisticated builder who will understand the need for green homes, condos and apartments. For example, we’re already seeing this trend in Atlanta, Chicago, Boston, New York, Seattle, San Francisco and Portland. This group is especially well represented in the LOHAS--Lifestyles of Health and Sustainability--psychographic market grouping, said to encompass up to 30 percent of the U.S. population (65 percent women).⁵²

As a case in point, Don Ferrier of Ferrier Custom Homes in Fort Worth, Texas, has noticed a “paradigm shift” in green home interest, driven in his mind by the aging “baby boomer” generation. Noting that green inquiries for potential customers are 10 times higher than three years ago, Ferrier reports that customers believe “this will be the last house we ever expect to build. Building it to a high performance level is the best investment we can make for our future.” These customers will pay a green premium because “they know it is worth it.”⁵³

Emergence and Popularity of Green Building Programs

Growth in residential green building certification programs bodes well for market growth. Beginning in earnest with the Austin green building program in 1990, dozens of local and regional green building programs now exist across the country. At the end of 2004, 62,000 homes had been built to regional and local standards (see Appendix IV for a table of programs).⁵⁴ Following the highly successful programs in the Bay Area in California, Colorado, Austin, Florida, and Atlanta, local and regional nonprofit- or industry-driven programs are coalescing builder interest and attention to green homes and promoting the widespread education and marketing of these homes to the public. On the national front, Energy Star-certification is now being joined in the field by NAHB’s green home voluntary

certification and LEED for Homes, which will further drive national awareness of the movement.

Government Involvement

Governments are increasingly turning to targets, incentives, and mandates to promote green building, as state and local governments are increasingly looking for ways to reduce the environmental footprint of their built environments. As attention in city halls and state capitals increases to issues like climate change, urban heat island effects, urban stormwater, and indoor air quality, policy makers are developing mechanisms to promote and require better and higher performing buildings. As the McGraw-Hill Construction study finds, codes and regulations in particular are viewed by builders as both major triggers and obstacles to residential green building.⁵⁵ As of February 2007, 53 cities, 10 counties, and 17 states had LEED-based mandates, incentives, or other mechanisms to encourage green building, most often in the commercial sector.⁵⁶ These encouragements include executive orders, legislation, policies, and incentives, such as tax credits, density bonuses, expedited permit review, and grants. While government involvement in supporting residential green building is less well developed (with the exception of green affordable housing), additional policies can be expected in the near future in governments which are adopting such initiatives in the commercial sector. In some instances, home builders are also feeling political pressure to improve the environmental performance of their homes.⁵⁷ As relationships with permitting authorities are critical, such pressure is a powerful force for driving attention to green design.

Socially Responsible Investing

The growth of pressure on publicly held companies, including homebuilders, to address climate change may also positively impact the green movement. In February 2007, a group of institutional investors representing \$337 billion in assets, led by the Institute for Responsible Investment and Calvert, surveyed the 13 largest publicly traded homebuilders in the country to assess their incorporation of green design and sustainability.⁵⁸ The results will be forthcoming in fall 2007.

Many financial institutions have begun to invest effort and capital in environmentally responsible real estate development. Professor Gary Pivo, at the University of Arizona, speculated in fall 2005 about five potential paths for socially responsible property investment (SRPI) to take off in the United States (following the strong examples set in Australia and the UK). These possibilities are:

- Creation of publicly traded Real Estate Investment Trusts (REITs).
- Investment in publicly traded real estate companies focused on sustainability.
- Creation of private SRPI funds for institutional investors.
- Initiation of an SRPI “fund of funds”--investing in multiple private funds to make SRPI accessible to individual investors.

- Formation of socially screened real estate mutual funds comprised of REITs and/or real estate stocks.⁵⁹

In keeping with these projections, institutional investors continue to push green development forward. The California Public Employees' Retirement System (CalPERS) continues to make good on its December 2004 promise to reduce energy usage in its \$8 billion real estate portfolio by 20% within 5 years as a part of its "Green Wave" environmental investment initiative.⁶⁰ This has materialized in part through development funds started with such leading real estate companies as Hines and Thomas Properties Group. Hines began their CalPERS Green Development Fund in September 2006, to concentrate \$500 million on developing high-performance office buildings throughout the U.S.⁶¹ Similarly, Thomas Properties Group is in the process of launching a \$500 million real estate fund to develop LEED buildings.⁶²

ENTERING THE RESIDENTIAL GREEN BUILDING MARKET: INTERNAL MOTIVATIONS

Research shows that builders are entering the green building industry for a variety of reasons, many of which overlap. According to the *McGraw-Hill/NAHB Residential Green Building SmartMarket Report, 2006*,⁶³ builders rank five factors as most important. Those factors external to a firm that builders perceive to be the most influential triggers of green building in the market are:

1. Consumer demand	55%
2. Codes and regulations	48%
3. Energy cost increases	46%
4. Competitive advantage	40%
5. Superior performance	38%

Interestingly, the top drivers and motivators for home building firms themselves, in considering building green, are slightly different than the perceived market drivers, and stress reputation and responsibility (reported by builders as very or somewhat important).⁶⁴ The green building drivers most influential within the firm are:

1. It's the right thing to do	92%
2. Lower lifecycle costs	87%
3. Competitive advantage	82%
4. Expanding business with interested customers	82%
5. Limited liability exposure	78%
6. Publicity benefits	78%

Although "doing the right thing", with appropriate skepticism, is still clearly stated as a primary driver in developers' decision-making to build green, the movement is now also attracting builders with a more purely bottom line focus. As Seattle-based residential green builder Martin Tobias describes: "If you're a developer and you look hard enough, you can

make a lot of decisions economically. I'm a total capitalist, and I'm doing this because I think it's the right thing to do economically. ... I'm not doing it because of a sense of altruism."⁶⁵ Builders are finding that green building allows for differentiation from the competitors, especially in a down market. Being able to talk about cost of ownership and durability adds real value to the sales pitch.⁶⁶

III. ELEMENTS OF A ROBUST GREEN HOMES MARKET

Developers and builders seeking to add a green component to their portfolios--or adopt green standards as a fundamental element of their business--must possess effective and comprehensive strategies to achieve success in the green homes marketplace. The existing paradigm of delivering a known product to a known consumer becomes clouded when confronted with both a product with less-familiar attributes and benefits and a consumer base with a diverse set of preferences and priorities. Many of the risks associated with jumping directly into the green homes market can be alleviated by a better understanding of the fundamental elements of the marketplace. The process of industry- and consumer-demand analysis in any given locale can be burdensome and add to the complexity of the product-to-market paradigm. However, by analyzing the system as a whole, new opportunities and drivers can be revealed that will help any entrant maximize returns while helping to reduce costs and avoid frustrating obstacles. The Market Engagement Framework (MEF) helps builders and developers gauge the relative strength of the marketplace and identify leverage points from which to devise a comprehensive strategy for market entry and growth.

The MEF contains two fundamental components: analysis and strategy. The Market Analysis component is described in detail here and the Market Strategy component is further explained in Section VI.

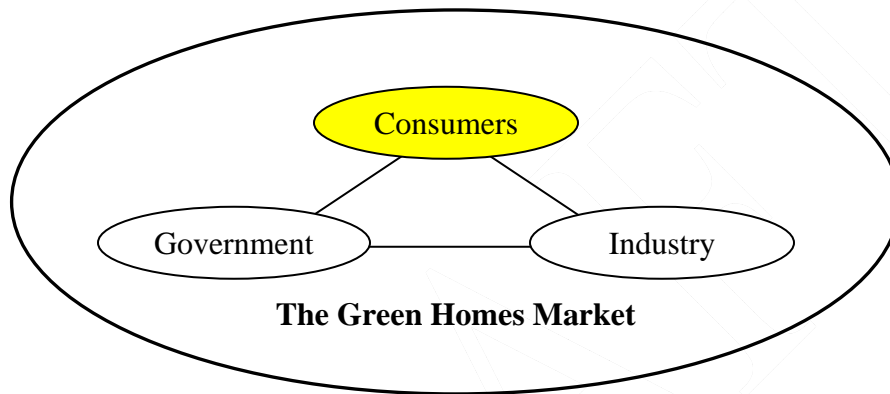
Market Analysis. The stakeholders in the residential green building marketplace are numerous and are found across most of the major sectors of civil society:

- Government and planning
- Non-profits and advocacy groups
- Industry associations
- Architecture firms
- Construction companies
- Real estate brokers
- Homebuyers
- Material suppliers
- Media
- Community groups
- Insurance agents
- Appraisers
- Home financing community
- Research institutions

Consumers, the end users of the product, are at the root of all activity in this arena, as the industry hinges on their ability to value the fundamental nature of the product being delivered. This complete landscape behaves as a complex system. To simplify analysis of the green homes marketplace, the various stakeholders have been aggregated into three primary elements: (1) consumers, (2) industry, and (3) government. A proxy method of analysis has

been developed that enables the builder or developer to gauge and evaluate the relative strength of each of the different elements by examining discrete features and characteristics within each respective element. Furthermore, two other external factors influencing the residential green building marketplace have been identified: (1) acute resource pressures and (2) macroeconomic trends. These pressures are more subjective in nature than the other elements, but are no less significant in contributing to the development of a comprehensive strategy to achieve the market engagement goals of the company.

CONSUMERS



Despite the various catalysts and drivers affecting the emergence and growth of the residential green building marketplace in any given locale, consumers ultimately control the market because their preferences and their ability to value the product are at the core of each transaction. Pardee Homes' Marketing Vice President Joyce Mason indicated in a March 2007 article that potential homebuyers have recently started to specifically ask for green features in their homes. She states: "We saw [the trend] first happen in hybrid cars. I think it's probably going to shift over to houses."⁶⁷ However, despite the up-tick in residential green building activity recognized at the national level, many builders express reluctance to commit valuable resources towards the production of green buildings because of the uncertainty in the marketplace related to consumer demand, costs, and availability of material. More specifically, many are not wholly convinced that the additional costs incurred by incorporating green technologies will be valued by the consumer enough to justify them. Ultimately, a cogent argument demonstrating the existence of a viable consumer base--one that is willing to pay for the premium features-- together with effective strategies to address that consumer base, will go a long way to encourage more active builder participation in this new space.

How does one identify the likely green homebuyer? The answer to this fundamental question is not as straightforward as one would hope. Unlike the straw-bale and/or "UFO-shaped" ecological and natural homes of decades past, green homes today look and feel like

any other conventional home with regard to their basic attributes. However, various national segmentation studies reveal a few statistically significant differences in attitudinal and behavioral characteristics that demonstrate an identifiable “high-value” buyer. Experts interviewed during the development of this report agree on various patterns found within the green home buying population. These similarities include higher levels of education, greater overall awareness of environmental issues such as global warming, and concern over the health and performance attributes of a home. Experts also express differences in consumer priorities based on geographical specificity. For instance, California residents are more concerned about energy efficiency and air pollution, whereas those in the southeast part of the country are more concerned with issues such as mold and indoor air quality. Lastly, certain project-level studies have been undertaken by developers to help understand the key factors affecting people’s decisions to buy and/or move into a green residence. These pre- and post-occupancy studies, reviewed later in this section, reveal additional prevailing characteristics of the green home consumer.

National Segmentation Studies

The most notable national studies conducted to help identify the likely green homebuyer are those by the Natural Marketing Institute, American LIVES, and Roper’s ASW. These studies reveal that the common characteristics of green homebuyers are generally based on consumer attitudes, behaviors, mindsets, and preferences (i.e. psychographic characteristics) rather than on easily-identifiable demographic characteristics. These studies rigorously support the notion that certain segments of the population are more likely to be receptive to the green building message and are, therefore, more likely to buy green than the general population. Thus, as touched upon earlier in this report, these high value potential green homebuyers are characterized by a faster absorption rate of green homes and a higher willingness to pay.

Natural Marketing Institute

The Natural Marketing Institute (NMI) is a leading business consulting and market research firm whose comprehensive consumer segmentation analysis focuses on tracking consumer habits related to the LOHAS marketplace. In its 2006 survey, five consumer segments have been identified: (1) the LOHAS consumer, (2) the Naturalites, (3) the Drifters, (4) the Conventionals, and (5) the Unconcerned. The first of these segments, the LOHAS group, shows “leadership in their attitudes toward the environment, society, and socially-responsible business.”⁶⁸ They tend to be passionate and knowledgeable about the products they buy, to be less price sensitive, and to be more brand loyal. They also generally consider themselves to be early adopters of new products and services. The second segment, the Naturalites, while less committed to environmental issues, are characterized by a general concern for personal health, an attitude reflected in their purchasing habits. The NMI 2006 survey indicates that together the LOHAS and Naturalites comprise 90 million consumers and represent 41% of the general population (16% and 25%, respectively). However, this

group accounted for 51% of the Green Building Users segment (24% and 27% respectively).⁶⁹ The LOHAS and Naturalite consumer is therefore more likely to purchase green buildings and products than is the non-LOHAS/non-Naturalite consumer. Data from 2003 and 2005 also substantiate the disproportionate propensity of the LOHAS consumer to buy green building products. As identified by NMI, the following are a few key characteristics of the LOHAS consumer:

- 79% of LOHAS consumers consider themselves either the “first person to start using new environmentally friendly products” or “ahead of most people,” compared to just 36% of the general population.⁷⁰
- 16% of LOHAS consumers possess post-college degrees, compared to only 10% of the general population.⁷¹
- The LOHAS customer is three times more likely to use/own renewable power or plan on purchasing renewable power in the next year as is the general population (6% vs. 2% in each case).⁷²

Furthermore, NMI’s 2003 research study identified the Green Homebuyer/ Remodeler and compared specific behaviors of that segment of the population to those of the general population. The Green Homebuyer/Remodeler include those respondents who indicated that they “plan to buy a home, renovate, or make an addition to their current home within the next year” and indicated one or more of the following is important for their building products:

- | | | |
|-----------------------------|----------------------------|---------------------------------------|
| • Biodegradable | • Environmentally friendly | • No chemical residues |
| • Chemical-free | • Formaldehyde-free | • No synthetics |
| • Contains recycled content | • Low fumes | • Non-toxic |
| • Energy efficient | • Natural | • Sustainably harvested ⁷³ |
| • Energy-Star certified | | |

Table 1 lists examples of the differences in purchasing behaviors of these consumers versus those of the general population, as revealed by the NMI research.

Table 1. Relevant Behavioral Differences in Green Homebuyers and Remodelers

Behavioral Attribute	General Population	Green Homebuyer/ Remodeler
Purchases of “Green” Products	* denotes statistically significant difference	
Hybrid Vehicles	0.3%	0.4%*
Renewable Power	6.3%	8.8%*
Alternative Healthcare	31.8%	44.4%*
Socially Responsible Investing (SRI)	10.6%	18.3%*
Healthy Foods and Beverages	53.7%	64.0%
- Celestial Seasonings	24.6%	33.7%*
- Stonyfield Farms	6.4%	8.2%
Natural/Organic Personal Care	61.5%	76.0%
- Aveda	9%	15%*
Cleaning Supplies and Household Products	77.0%	92.2%
- Seventh Generation	2.7%	4.2%*
Energy-Efficient Appliances	74.1%	85.5%
Energy-Efficient Electronics	52.3%	64%
Dietary Supplements	75.3%	86.3%
Memberships to Clubs/ Organizations		
- Library	44.6%	50.7%
- The Nature Conservancy	4.6%	6.7%*
- Sierra Club	2.7%	3.4%
- Zoo	8.8%	12.0%*
- Museum	8.2%	11.2%*
- Performing Arts Center	5.4%	6.3%
- Horticultural Center/Garden Club	2.7%	4.4%*
- Science Center	2.6%	4.4%*
Readership and Viewership		
Magazines		
- <i>Better Homes and Gardens</i>	28.3%	39.4%*
- <i>Consumer Reports</i>	23.6%	34.9%*
- <i>National Geographic</i>	18.8%	28.8%*
- <i>Good Housekeeping</i>	20.9%	25.1%
- <i>Newsweek</i>	16.1%	21.3%*
- <i>Prevention</i>	10.0%	12.8%
- <i>Cooking Light</i>	8.7%	12.4%*
- <i>Discover</i>	7.3%	10.7%*
- <i>Martha Stewart</i>	7.3%	12.0%*
- <i>Parents</i>	6.3%	8.8%*
- <i>Men’s Health</i>	5.6%	6.1%
- <i>Money</i>	5.5%	9.5%*
- <i>Fitness</i>	4.8%	5.5%
- <i>Self</i>	4.5%	6.5%*
- <i>Health</i>	4.4%	6.1%*
- <i>Sierra Club</i>	2.1%	2.5%
Newspapers		
- <i>The New York Times</i>	7.7%	10.1%*
- <i>The Wall Street Journal</i>	5.7%	9.5%*
Television/Radio		
- PBS	28.7%	37.7*
- Home and Garden Channel	26.4%	36.8%*
- NPR	19.9%	25.9%*
- This Old House	19.2%	28.4%*

The results of the NMI study suggest that the green homebuyer generally demonstrates a multitude of significant differences in certain purchasing behaviors that combine to make identification through a proxy method of analysis possible. The results also reveal possible ways to target these consumers and develop appropriate marketing and advertising materials.

American LIVES

American LIVES (*Lifestyles Interests Values Expectations Symbols*) specializes in understanding how values and lifestyles relate to more complex consumer decisions, such as how to buy a house. It identified “a new revolutionary movement emerging in America” comprised of people described as “Cultural Creatives” and estimated to be 26% of the US population.⁷⁴ Their attributes, or frame of mind, related to green homes includes a “focus on green, authenticity, the home as a nest, sense of neighborhood and community, nature as sacred, and arts and culture.” Similar to the LOHAS consumer, Cultural Creatives (or “Creatives”) are also identified more by their attitudes and behaviors rather than their demographics, although they do tend to be “a little better educated than most: 30% are college graduates”⁷⁵ (as compared to a national average of 27.2%)⁷⁶. Another segment, “Winners with Heart” (essentially status-conscious people with a spiritual side) rated almost as high as the “Creatives” with regard to their propensity to purchase green homes. Brooke Warrick, President of American LIVES, states that a third segment “Heartlanders” (also referred to sometimes as “Traditionalists”) make good buyers if the benefits they seek in a home are properly conveyed.⁷⁷

Roper ASW

Roper ASW, a leading global marketing research and consulting firm, performed its own environmental segmentation analysis in 2002, in which they identified five different population segments: True Blue Greens (9%); Greenback Greens (6%); Sprouts (31%); Grouzers (19%); and Basic Browns (33%). According to the research, True-Blue Greens believe that being green is a way of life, and experts, including Bob Taber, Managing Partner of Thomas, Taber, & Drazen, and marketing consultant for Built Green Colorado, assert that these individuals are likely to be already examining green homes as part of their home buying decision and, consequently, will be highly receptive to the green home message. Greenback Greens are only moderately active in their environmental behavior, but are typically willing to offer financial support and to buy green as long as it does not compromise comfort and convenience.⁷⁸ Sprouts care about the environment but are generally “environmental fence-sitters,” who evaluate environmental issues on their individual merits, benefits, and/or effects.⁷⁹

Together, the True Blue Greens, Greenback Greens, and Sprouts comprise 46% of the population and are all viable green homebuyers.⁸⁰ However, conveying the message to the latter two segments requires more effort than with the True Blue Greens, because some convincing is necessary to impact their purchasing decision. Roper identified the True Blue

and Greenback Greens as possessing higher education and income levels than the other segments. The Grouzers and Basic Browns segments are uninvolved and disinterested in environmental issues, therefore marketing and selling to them would require more involved efforts.

Expert Opinions

Several of the people interviewed for this master's project corroborated the notion that the most highly receptive green homebuyer possessed attitudes and exhibited consumer behavior similar to the LOHAS, Cultural-Creative, and True Blue Green segments.

- Barr Hall, Director of Sales and Marketing at McStain Neighborhoods, one of the premiere green home builders in the U.S., views his target audience as a “subset of the Cultural Creatives.” They do not need to be “rabid-green, but it’s good [for them] to have an increased level of awareness about environmental issues.”⁸¹
- Tom Paladino, President of Paladino & Company-Green Building Strategies, indicated that the “Creatives” were a likely consumer due to their propensity to ask a lot of questions. He also posits that “Traditionalists/Modernists” would follow.⁸²
- Mike O’Brien, Green Building Specialist for the Portland Office of Sustainability, agrees: “People with strong personal values are most interested in green building. They’re creative. It’s about making informed choices.”⁸³
- Mary Westcott, Administrative Director for LEED for Homes with the Davis Energy Group, views many of her clients as “innovators, early adopters, and holistic-thinkers.”⁸⁴
- Erich Volkert of Living Homes in Santa Monica, California, indicates that they specifically target urban and suburban centers where Whole Foods are opening and people are driving Prius’.⁸⁵

Others also see the connection between the motivation to buy a green home and the motivation to buy other green products. Dennis Allen, President of Dennis Allen Associates, indicated that he is constantly bumping into clients and interested green homebuyers at local farmers’ markets in the Santa Barbara area.⁸⁶ Mike O’Brien also links the growing demand for green homes with the increase in demand for organic and natural foods in the Portland area. O’Brien reflected on there being only one farmers’ market a decade ago, whereas now there are approximately 25 throughout the city on different days of the week. Restaurants with menus offering organic and natural foods have also proliferated in the last decade, giving rise to a niche specialty-farming industry around the city.⁸⁷ Both Allen and O’Brien highlight the concentration of hybrid car owners in their regions as also indicative of consumer demand and awareness for green products in general. Indeed, Portland ranks first in the country in the number of hybrids sold per thousand households, with Santa Barbara ranking fourth. Monterey and San Francisco fill in the second and third slots.

Many developers, builders, and other industry experts also draw a connection between a homebuyer's formal education and their propensity to purchase green homes. The belief is that the green home consumer is typically more highly educated. Regarding education-levels specifically, Barr Hall conducted a focus group study of 1800 McStain customers and found two dominant trends: (1) education was key; prevalence of master's degrees or higher among clientele was significant--four times that of the general population; and (2) clientele demonstrated a propensity to attend live theater, visit art museums and botanical gardens, and be active in other cultural clubs and events.⁸⁸ Erich Volkert, Dennis Allen, Brooke Warrick, and Rich Dooley also mention higher education as a characteristic of the likely green homebuyer.⁸⁹

Likewise, a slightly higher income level is common for the green homebuyer:

- A study, performed by Thomas Taber & Drazen for Built Green in Colorado, reveals that those more likely to be aware of Built Green are married and college educated, have a household income between \$100-\$150K, and live in houses costing \$300k-\$500k.⁹⁰
- Dennis Allen, President of Dennis Allen Associates, a building company in Santa Barbara and Ventura County, California, has noticed that his clientele are typically upper-middle class rather than upper-class. He feels the highest income buyers generally do not show a lot of interest in green features.⁹¹
- Abbey Ehman, a green building professional who is helping pilot the LEED for Homes program in Texas, believes that the green consumer is one that must be willing to make trade-offs: "Part of being green is not having all of the options."⁹² Therefore, the highest income earners may not be willing to concede certain things (size, material) that are essential to being green.⁹³
- Amy Bolton, of Christopherson Homes, agrees, stating: "It's not the [highest-income earners] who don't really care about operating costs and still want all of the bells and whistles and square-footage of luxury homes. It's the informed upper-class consumer with some discretion and conservatism in how they spend money."⁹⁴

Many experts surmise that many consumers of green homes are influenced in their decision making by factors not related to any sense of environmentalism, but rather by factors such as quality, durability, effect on health, and operating cost-savings. The issue of quality often arises with those homebuyers who pride themselves on owning the best available products and technologies - the "state-of-the-art." (An extension of this is the "keeping up with the Joneses" one-ups-manship mentality exhibited by certain homebuyers.) However, quality is also important when considering the more mainstream consumer who is driven by rational arguments and pragmatism rather than by reasons related to environment or lifestyle.

- Gordon Cooke of Building Knowledge speaks about quality: “Consumer expectations are constantly on the rise, whether it’s a car or a house or a piece of fruit. Zero-defect houses are now in demand. Customer service and comfort will soon be demanded as well. [The green building movement] follows trends seen in other industries (cars and appliances) where the consumer expects more.”⁹⁵
- Abbey Ehman states: “Some [purchase green homes] to show off to their friends. Some do it for the greater good. But most do it really only if it makes sense for themselves first. Most want it for durability, comfort, and energy savings. They want to be comfortable, not pay too much for it, and be able to resell it. Homebuyers will pay a 5% premium for green features, but they also demand a 5-year payback. Twenty- or 30-year paybacks simply don’t resonate.”⁹⁶

In conclusion, industry experts strongly believe that the LOHAS consumer, the Creatives, and the True Blue Greens are motivated and educated consumers and, therefore, highly receptive to the green home message. Although all three of these segmentation groups generally desire a home that meets their more traditional needs of location, space, and affordability, they often either seek out green home providers specifically or are already attuned to the benefits of green homes. However, it is often pointed out that these groups are not the only ones buying green homes and, therefore, not the only viable and attractive segments. Successful engagement of the marketplace hinges upon the ability of a builder or developer to communicate product benefits to the larger, more mainstream, population. Indeed, Marc Richmond sees green homes as appealing to anyone “who wants something better.”⁹⁷

Project-Level Surveys

Several project-level surveys have been conducted to help determine the principle drivers and attitudes related to the green home purchasing decision within specific communities that have been built to a green standard and marketed as such.

For instance, the results of surveys green home buyers in the Ladera Ranch development in California indicate that most homebuyers want to see builders do more in the area of green building and that a majority of homebuyers is generally willing to pay an additional \$50 or more on their monthly mortgage payments for green features. Eighty-three percent respond in the affirmative to the statement: “I would spend money to save energy, if I could recover it in lower utility bills.” Only 10% of the respondents indicate they are not concerned about energy-saving features. More specifically, new technologies that improved indoor air quality are indicated as being “very important” or “essential” to have in the home by a majority of the respondents.⁹⁸

A consumer survey conducted by Polaris Inc. in 2005, on behalf of Christopherson Homes in Northern California, which is responsible for over 3,500 homes in 30 communities,⁹⁹ shows similar results among the 192 respondents: 22% of respondents

indicate they “would spend extra money when purchasing a home to save energy even if [they] knew [they] might not be repaid in savings on utility bills.” An additional 72% say that they “would spend extra money when purchasing a home to save energy, if I could recover it in lower utility bills.” To the respondents, the term “green building” typically means “good for the environment,” with a small majority (51%) equating it to “reduced energy bills”. Furthermore, only 42% link green building to a “healthier indoor environment,” and only 22% link it to “better built homes.” Lastly, 74% of respondents are either “somewhat aware” or “very aware” of green building techniques and features.¹⁰⁰ Christopherson Homes’ salespeople have observed the following traits about their clientele:

- “People love the idea of solar but don’t want to pay for it.”
- “Resource conservation is important to governments but most buyers don’t value it as much.”
- Indoor Air Quality is most important, followed by energy savings.¹⁰¹

In December 2006, the National Renewable Energy Laboratory (NREL) published “A New Market Paradigm for Zero-Energy Homes: The Comparative San Diego Case Study,” which reveals salient features of the purchasers of Zero-Energy-Homes (ZEHs) in a SheaHomes community in comparison to purchasers of more traditional homes in a comparable community. In addition to a multitude of questions, the study tested two hypotheses: (1) the buyers of the high-performance SheaHomes would possess more environmentally-conscious attitudes than the buyers of the comparison community homes and (2) the SheaHomes buyers would exhibit more characteristics of innovators and early adopters than the comparison-community buyers. Close examination of the survey results reveals that 47% of those that purchased SheaHomes’ Zero-Energy-Homes agree that they tend to buy environmentally friendly products even at higher cost, compared with 41% of those survey respondents that purchased traditional homes in the comparison community.¹⁰² Similarly, 74% of SheaHomes respondents indicate they “like to experiment with new ways of doing things,” compared to just 63% of comparison respondents¹⁰³ Although the study reveals that purchasers of SheaHomes’ Zero-Energy-Homes exhibit many of the same attitudes and beliefs (as well as a similar demographic profile) as those of purchasers of comparison homes, some evidence suggests that the likely purchaser of green homes does, in fact, possess environmentally conscious attitudes and exhibit characteristics of early adopters.

In conclusion, there are certain behaviors and characteristics that are common among likely green homebuyers. This buyer often:

- Seeks out healthy food options.
- Purchases green products.
- Participates actively in environmental and cultural organizations.
- Desires holistic experiences and authenticity.
- Looks for multiple and extensive sources of information.

- Pursues higher education.

Use of the Market Engagement Framework for the Consumer Element

Green homes, when viewed as a consumer product, possess features that allow them to be absorbed into the marketplace. However, the green building consumer often demonstrates a variety of demographic, psychographic, and behavioral characteristics that cannot be easily placed into any one segmentation profile. Although many purchasers of green homes understand and value the associated attributes and benefits, many others may just enjoy the “look and feel” of the house regardless of the features that make it green. Because there is no single profile of the green home consumer, sizing the market becomes difficult. However, the proxy method of consumer-demand analysis is still relevant and provides a multi-faceted approach that identifies: (1) which geographies to specifically target, (2) the level of maturity of consumer awareness, and (3) how to best leverage prevailing attitudes in a marketing and sales strategy.

Many experts interviewed agree in principle that green homes can be sold to just about anyone as long as the green homes message is delivered correctly. However, the ability to identify likely green home buyers provides a two-fold benefit: lowering transaction costs associated with making sales and identifying appropriate marketing messages that will resonate most effectively within a chosen geography. Therefore, a proxy analysis, although not without limitations, is still a worthwhile endeavor for those looking to understand the nature of consumer demand within particular locations. The behaviors that can be relatively easily gauged for different locales have been winnowed down from the list of all associated and relevant behaviors in order to quickly and easily measure the relative strength of the consumer market for green homes.

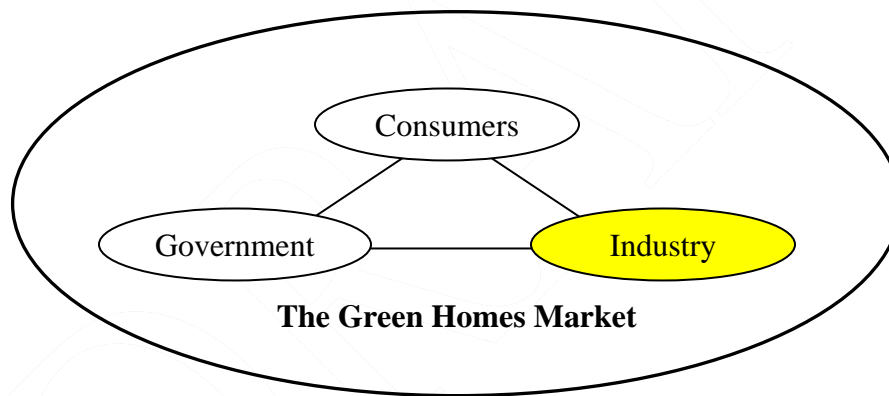
The research suggests that the green homebuyer is more likely to own a hybrid vehicle or shop at natural food stores than is the general population. Obviously, buying a hybrid vehicle or shopping at Whole Foods does not guarantee that the consumer will then purchase a green home. However, the proxy analysis does provide a relative basis for gauging potential consumer demand. Most importantly, a large number and percentage of people in a given area buying hybrid vehicles and shopping at Whole Foods can be seen as a positive sign that there is a viable consumer base in the area highly receptive to messaging about the benefits of green homes.

SustainLane comprehensively assesses a city’s greenness. Founded in 2004, SustainLane publishes rankings on U.S. city sustainability covering such topics as population mobility, traffic congestion, air quality, government innovation, and climate change initiatives. For the consumer proxies, the city ranking on local food and agriculture use is particularly informative because it considers the number of farmer’s markets and community gardens per capita.¹⁰⁴

Consumer Proxies and Indicators

- Sales of hybrid vehicles
- Number of existing Whole Food Markets
- Number of Whole Food Markets slated for development
- Number of Natural Food Stores carrying Celestial Seasonings products
- Number of Natural Food Stores carrying Stonyfield Farms products
- Wholesale Clubs and Specialty Shops carrying Stonyfield Farms products
- City Rating for Local Food & Agriculture by SustainLane
- Number of Aveda stores
- Number of Aveda salons/spas
- Number of stores selling Seventh Generation products
- Educational Attainment: Bachelor's Degrees
- Educational Attainment: Graduate or Professional Degrees

INDUSTRY



The industry element of the green homes market carries tremendous importance because it provides the expertise, labor, and capital required to deliver homes to the end-user. In addition, industry often provides the vision and initiative necessary for market transformation and growth. In this case, “industry” refers not only to businesses, but also to non-governmental organizations, nonprofits and industry or trade associations, including green home certification programs run by non-profits or industry groups.

Dennis Creech, Executive Director of the Southface Institute and champion of the EarthCraft green homes standard in Atlanta, Georgia, states that there are two primary methods for builders to make money from green building. The first is to improve construction science in order to reduce waste, increase energy efficiency, right-size mechanical systems, etc., with the ultimate goal of reducing costs. The second is to improve building quality in order to differentiate the product and to gain a market advantage by growing a price premium or increasing market share.¹⁰⁵ Fortunately, these methods are not

mutually exclusive and tend to support each other if done properly. Industry professionals will always have the need to increase (or at least maintain) profits while building green.

Industry Stakeholders

Industry is complicated and multi-faceted, but also resilient, ingenious, and fast-moving. As with conventional real-estate development, residential green building is the result of the combined efforts of developers, builders, specialists (including architects, engineers, landscape architects, urban planners, and others), home financiers, brokers and realtors, councils and associations, and other organizations. Further information regarding specific industry players and their activities in the four geographies targeted within the scope of this report can be found in Section IV.

Developers

Real estate developers across the country are working to advance in the residential green building industry. With their controlling position of the development process, they are able to set guidelines for builders and often take the lead on the greening process.¹⁰⁶ Rancho Mission Viejo (RMV), for example, is a development company controlling 23,000 acres in Orange County, California. In its new 4,000-acre master-planned community, Ladera Ranch, the company is endeavoring to incorporate sustainability in all of its decisions for housing, site planning, and transportation.¹⁰⁷ Much of this effort stems from the considerable success of RMV's Terramor, "the largest green-oriented village of production style homes in the nation."¹⁰⁸

WCI Communities of Florida, with roughly \$2 billion in annual revenue, is similarly driven to create sustainable communities. Since being recognized for conservation efforts by the Urban Land Institute for their 1970s Pelican Bay development, the development/building company has increased its efforts by incorporating green building into their mainstream homes production practices.¹⁰⁹

Another developer making significant strides in promoting residential green building is Cherokee Investment Partners. Working with the national building company Centex, Cherokee incorporates substantial elements of green design (such as water conservation, on-site agriculture, green building materials and techniques, and geothermal energy) in its Kanawha development in South Carolina, contributing to the momentum in the southeast United States.¹¹⁰

Builders

Small, mid-size, and large-scale production home builders have all championed the residential green building movement. Some companies are only recently exploring this emerging sector, while others have been actively involved in residential green building for decades. For example, Dennis Allen of Allen Associates, a mid-size commercial and

residential builder in Santa Barbara, California, has been building passive solar-designed houses since the early 1970s. Throughout that time, Allen Associates has built homes that “generate energy instead of consuming it, produce waste water that is purer than the incoming water, produce zero waste, and purify the air.”¹¹¹ Similarly, McStain Neighborhoods of Colorado, a premium builder crafting roughly 400 homes each year, was founded in the 1960s and has received a tremendous amount of national press coverage for their dedication to building sustainably and to keeping their customer satisfaction ratings well over 90%.¹¹²

Although small builders generally have been faster to take up green building as part of their businesses, large builders have been motivated as well. As noted earlier, McGraw-Hill reports that 59% of large builders (those that build at least 10 units per year) expect to build at least 15% of their projects in 2007 that would meet the Bronze certification level of the NAHB’s green building guidelines.¹¹³

Specialists

Every week, more architects, engineers, landscape architects, ecologists, and urban planners choose to join the green building movement. However, there exists a high degree of variability of quality and experience between these industry professionals. While many have been working in triple-bottom-line businesses for decades and have numerous tangible successes to show as a result, many more are simply drawn to what they perceive as an emerging economic opportunity. However, some of these new entrants may lack the expertise and sustained motivation necessary to fully capitalize engage the residential green building market and may instead seek opportunities to short-cut and capture a fleeting windfall. Over the next several years, discerning clients will need to separate true greenness from green-washing. That said, it is certainly necessary to call upon the skill sets of valuable professionals to contribute to the success of green residential-development projects.

In smaller markets or those that have slower housing growth rates it may be difficult to support the professionals needed to implement green building. In parts of Georgia and Florida, for example, building inspectors are needed who have experience with the EarthCraft green homes standard; not all potential markets are able to incorporate this standard due partially to the lack of qualified professional inspectors.¹¹⁴

Online databases provide lists of green building professionals. The USGBC website allows users to search its listings of professional members and professional organizations by location (e.g. city, state, etc.) and by category (e.g. architect, contractor, consultant, etc.).¹¹⁵ The Energy Star website has a directory called “New Homes Partner Locator” that also allows users to search for professionals familiar with Energy Star by state.¹¹⁶ Finally, the “Who’s Green?” yearly directory, produced by the Ecotone Publishing Company, is a useful source for finding professionals within the green building community throughout the country.

Home Financiers

Lending institutions have begun to capitalize on the financial opportunities related to energy-use improvements and up-grades to homes by loaning money to home owners for such purposes. Once the up-grades have been completed, the savings from reduced energy use help pay back the loan. These energy-efficient mortgages (EEM) have been available since 1981, but have remained largely under utilized until recent years. As of 1998, a potential EEM is only validated if it meets the criteria set by the Mortgage Industry National Home Energy Rating System (HERS) Accreditation Standard.¹¹⁷ Since then, and in keeping with the growing interest in green building in the residential sector, EEMs have become more prevalent and have served as an awareness raising tool for green building end-users. Energy Star has compiled a list of approved lenders and provides public access to the information on a state-by-state basis.

Brokers and Realtors

Eco-broker International is a recent addition to the real estate world. The Colorado-based organization has trained and certified hundreds of eco-brokers throughout the United States, providing an accredited title for the brokers who seek to educate builders and homebuyers about environmentally friendly homes and to engage more fully in the burgeoning green homes market. This allows certified eco-brokers to speak informatively about green homes and to help properly differentiate green homes from conventional homes. The certification is relatively new (started in 2003) and is slowly spreading from the mountain states to other local markets around the country. In many states (such as Indiana, Alabama, Connecticut, and Arkansas) there are no registered eco-brokers at this time.¹¹⁸

Realtors are also realizing the value of becoming well-versed in the language of green homes. As of February 2007, the database designed to track real-estate listings, known as a Multiple Listing Service (MLS), in Portland, Oregon, has incorporated energy efficiency as a feature. As this tracking component expands to other geographies, realtors will become more familiar with energy-efficient concepts and will generate data on purchasing rates and premiums paid for energy-efficient buildings.¹¹⁹

Councils, Associations, and other Organizations

On both the national and local level, many complementary organizations play vital roles in the advancement of the green building industry. Clearly, the United States Green Building Council (USGBC) has raised awareness about green buildings and helped to shape policy. Additionally, USGBC chapters around the country serve green building proponents and collaborators. These chapters can serve as indicators of green building activity and interest in a locale. Also, the number of LEED-Accredited Professionals (LEED APs), the number of certified (completed) LEED projects, and the number of registered (projected) LEED projects paint a detailed picture of the local industry forces at work.

The Urban Land Institute (ULI) and the National Association of Home Builders (NAHB) have positioned themselves at the forefront of the green building movement and have received nationwide press coverage as a result. ULI regularly produces a compendium of green building articles across media and professional journals, much of it from its own magazine *Urban Land*, for distribution throughout the industry. By partnering with the Green Building Initiative (GBI) and local Home Builders' Associations (HBAs), the NAHB has helped to develop over 15 green building programs in U.S. housing markets, all based on the NAHB's Model Green Home Building Guidelines.¹²⁰ These guidelines provide an alternative view of green homebuilding and compete directly with the LEED for Homes rating system.

While national organizations have raised the issue of green building around the country, many localized green building programs have provided the grassroots efforts necessary to galvanize the issue for homebuyers. Built Green Colorado, for instance, has marketed their own specific local brand of green homes to Colorado homebuyers for a number of years and has raised awareness of Built Green homes in that state to surpass awareness of Energy Star homes, a nationally recognized brand.¹²¹ Two other successful localized programs are the Austin Energy Green Building Program (in Texas) and the Southface Institute (in Atlanta, Georgia). The latter created a partnership network through its EarthCraft green home rating system consisting of dozens of builders and renovators in the greater Atlanta area. By providing green building training and resources for builders and by partnering with organizations like Home Depot, Delta, Georgia Pacific, Whirlpool, and Energy Star, the Southface Institute expects to certify between 1,000 and 1,500 EarthCraft green homes in 2007.¹²²

Reasons for Success

Companies have successfully transitioned from conventional building and real estate to incorporating green building practices into their standard operating procedures. As discussed earlier, these firms are driven by an interest to differentiate their products, a dedication to high quality, a commitment to helping the natural world, and even a curiosity for exploring an exciting new avenue of business opportunity.

Whatever the motivation, the transition and internal drive have a better chance of success if there is a champion (or team of champions) pushing the process forward. The likelihood of success increases even more if the champion is encouraged, supported, and rewarded in these efforts. Very often within organizations that have embraced the green building market, the initiative can be traced back to a strong, internal champion for the cause. In Florida, the large-scale developer/builder WCI Communities began its first green prototype home in 2001 because the then-current Chief Executive Officer Al Hoffman decided those efforts would be worthwhile for the company. After his departure as the head of the company, the green projects would not have continued without a dedicated group of

leaders pushing progress forward.¹²³ The champions themselves can frequently be classified as LOHAS or Cultural Creatives in the same way that the green homes buyers can.

Challenges for the Green Building Industry

Within the industry element, one considerable challenge that the green homes market faces is successfully meshing national certification or guideline programs (e.g. LEED or the NAHB's guidelines) with its local counterparts (e.g. Built Green Colorado or EarthCraft). As it stands, there are estimated to be in excess of 40 local green building standards in the United States.¹²⁴ This obviously causes confusion for the homebuyer, as it is difficult to discern which standard has higher requirements and which weighs energy use, water use, recycled content, and other aspects of green buildings heavier than others.

Another common difficulty is the myriad of actors affecting the value chain in the residential market. Usually a developer purchases or gains rights to a piece of land, then contracts building rights to a builder (or series of builders), and then the builder's sales staff (or even a fourth entity: a selling agent) is responsible for selling the constructed homes to the end-users. Even if the developer is interested in and dedicated to building green, the builder may demand or expect that the buyer is willing to pay a premium to cover not only any potential increase in building costs, but also the learning curve necessary to incorporate new green building practices. As Bob Taber describes:

For a high-volume production builder in the \$150-\$200 thousand cost range, there can be significant costs in switching over. From spec'ing and purchasing, all the way over to inspection, there's so much associated with the transition that there will be significant start-up costs (since all of their systems must be re-worked). This is a big challenge for production homebuilders. They don't want to go through that transition without consumer demand for it.¹²⁵

This learning curve relates to yet another challenge for the residential green building industry – skill and capacity building. It is not uncommon for a large portion of home building to be completed by sub-contractors. Often, these sub-contractors employ workers ill-prepared to institute green building techniques on job sites. Additional training is frequently necessary to enable workers to complete the tasks because they tend to be different than conventional practices and developers may not have direct control over sub-contractors. This results in a re-structuring of the standard operating procedures of sub-contractors, builders, and developers driving the process. Overcoming learning curve challenges is often most effective through partnerships with industry and government players who have greater green building experience. This is further discussed in Section VI.

Use of the Market Engagement Framework for the Industry Element

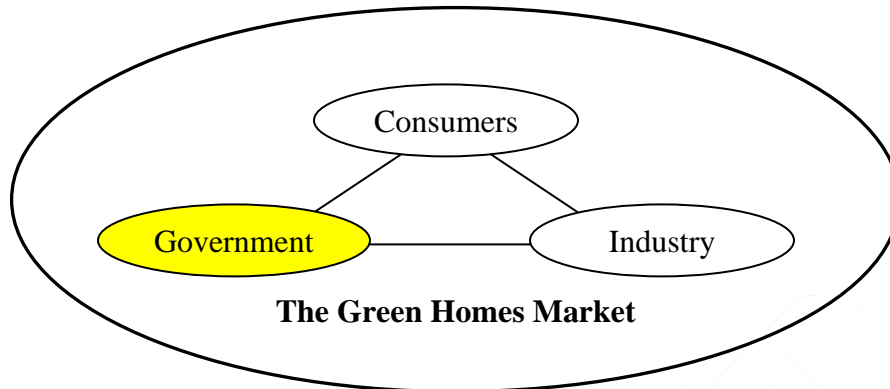
The Market Engagement Framework's analysis component (encapsulated in the Market Metrics Lens or MML) is designed to provide the information that developers need when

building in a specific geography. The information is both quantitative and qualitative for the industry element (as seen in the text in Section III and the MML in Section IV of this report). The latter describes some of the major green developments and notable green professionals in the area. It is necessary to consider these developments and the quantitative data provided in the MML to gain a comprehensive view of the geography in question.

Industry Proxies and Indicators

- Green Building Associations/Coalitions
 - Residential Green Building Programs
 - Year founded
 - Green Building Organizations
 - Year founded
 - US Green Building Council (USGBC) Chapters
 - USGBC LEED-Accredited Professionals (APs)
 - LEED APs per Capita
 - LEED-existing buildings
 - LEED-registered projects
 - USGBC organizational memberships
 - Energy Star Homes (market penetration percentage of new homes built in 2005)
- Green Building Service Providers
 - Energy Star Site-Built Home Builders and Developers
 - Energy Star Site-Built Home Builders and Developers per 1,000 housing units authorized in 2006
 - Energy Star Home Energy Raters
 - Energy Star Home Energy Raters per 1,000 housing units authorized in 2006
 - Energy Star Lenders (mortgages)
 - Energy Star Lenders (mortgages) per 1,000 housing units authorized in 2006
 - Energy Star Utilities/Sponsors
 - Energy Star Utilities/Sponsors per 1,000 housing units authorized in 2006
- SustainLane: Green (LEED) Buildings
- SustainLane: Green Economy

GOVERNMENT



The support of government institutions and public agencies, including utilities, is critical to the market growth and support for green homes. Several residential green building experts, including Michele Russo, Directory of Industry Communications at McGraw-Hill Construction, view municipal polices, programs, and mandates as critical to the growth of green building.¹²⁶ As mentioned earlier, government involvement in promoting green building is on the rise. Expanding on lessons learned from earlier incentives in commercial green buildings, governments are now exploring and implementing mechanisms for promoting residential green building. These mechanisms include expedited permitting, mandate and grant policies, density and tax incentives, affordable housing bonuses, and public recognition. In addition to the tangible benefits to both builders and buyers that incentive programs afford, government programs and initiatives indicate an effort by elected officials to serve an interested public.¹²⁷

Institutional/Policy Dynamics

In some cases, government programs are being enacted in municipalities that have not yet had significant green building activities. Boston's recent private-sector green building mandate is one such case. Other times government programs can be viewed as lagging indicators of significant green building activities in a city, such as increasing building-code standards to recognize increasing building performance. Regardless, a significant attribute of government programs at the local and regional level is their staying power. Unlike federal tax credits for energy efficiency, which usually expire after only a few years, most local and regional government programs last for many years.

The USGBC does a good job of cataloging such programs and policies at the state and local levels, and provides these resources publicly.¹²⁸ In addition to mechanisms for supporting green building, the existence of departments and offices devoted to promoting green building is an important indicator of government support.

SustainLane's government measurements provide annual rankings of the top 50 cities along a number of sustainability metrics, including land-use policy, city innovation, and knowledge base.¹²⁹ The land-use policy component ranks cities based on park space and sprawl. Green building expert Greg Kats of Capital E sees smart growth and planning policies as strong indicators of likely support for green residential building.¹³⁰ The city innovation ranking incorporates green building incentive programs and support for car sharing and carpooling. The knowledge-base component includes the existence of a sustainability department in city government and the establishment of sustainability goals.

Mayors Agreement on Climate Change

Climate-change efforts at the city level have played a major role in focusing attention on the built environment. The setting of global-warming emissions-reductions targets by cities represents a significant step and, recognizing that the buildings are a large contributor to greenhouse-gas emissions, will likely be followed by policies to increase energy efficiency in the built environment.¹³¹ On June 13, 2005, the U.S. Conference of Mayors unanimously passed the Mayors Climate Protection Agreement. As of March 1, 2007, 431 mayors across the country signed the agreement, which includes setting reduction targets and implementing action programs.¹³²

Use of the Market Engagement Framework for the Government Element

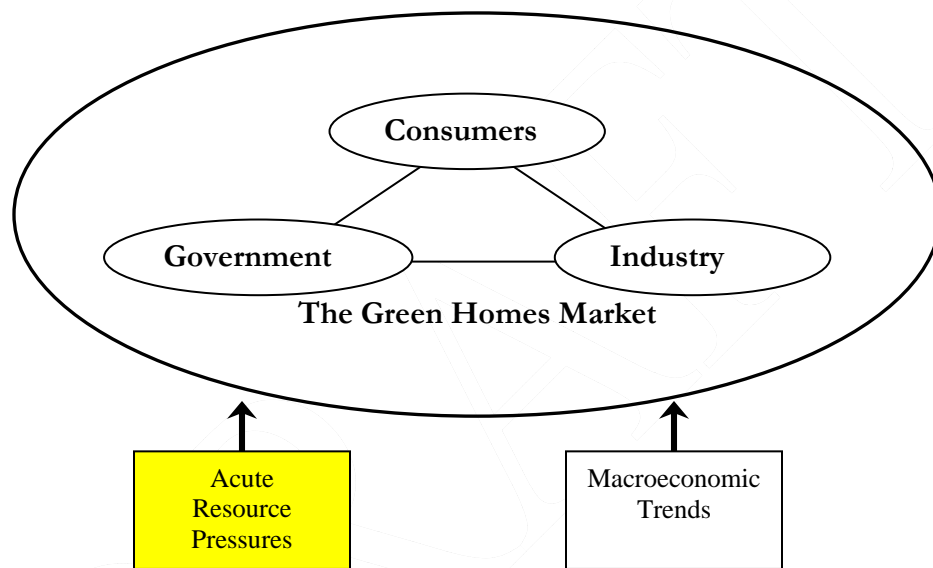
For the government element, the Market Engagement Framework's analysis component is composed of largely qualitative indicators to assess the strength of government attention to and support for residential green building. The indicators cover a government's attention to the environmental impacts of development in general, such as policies and programs on climate change and land use planning, as well as specific initiatives around promoting green building. Both "carrots" (incentives) and "sticks" (mandates) for green building are critical policy mechanisms of city and state government that developers need to be aware of in assessing the government element of the green residential market. Overall, the indicators listed below provide a robust lens into the current or likely government support for residential green building.

Government Indicators

- Discrete city-level sustainability committees and/or departments
- SustainLane: Knowledge-Base ranking
- Kyoto buy-in from leadership (Mayor, City Council)
- SustainLane: City Innovation ranking
- Municipal support for green building
 - Fast-tracking for green or LEED
 - Density bonuses (Floor-to-Area Ratios)

- Taxes credits and grants
- Municipal Mandates
 - Target for public buildings
 - Requirement for public buildings
 - Target for private buildings
 - Requirement for private buildings
- State Level Support/Requirements
- SustainLane: Planning/Land Use Rankings

ACUTE RESOURCE PRESSURES



In planning potential projects, developers must consider topics of immediate interest and those that may have become consumer “hot-buttons.” Often, these topics can become acute pressures on decision makers in the area, whether those decision makers are consumers or potential building partners for the developer. These pressures frequently stem from real or perceived threats in resource scarcity of one or more types, and will affect consumer awareness, industry innovation, and government environmental, building, and urban limit policies.

For example, in the southwest United States, water-use rights and water-use reduction are particularly charged issues. As a result, native landscaping (as opposed to English-style lawns) has become the standard expectation in many cities in the southwest. Developers working there should be particularly interested in other water-conserving or stormwater-runoff techniques, such as greywater systems, permeable pavements, or natural rain catchments. Consumers and builders may both value and be particularly receptive to these

inclusions, even to the degree that absorption rates and/or consumer willingness to pay may be enhanced.

Other examples of these location-specific acute pressures include density and smart growth issues in New Jersey, hurricane appropriateness in Florida and the Gulf Coast, transit and transportation considerations in Houston, and biodiversity and species endangerment concerns in the Pacific Northwest. These pressures can occasionally spur the creation of new green building programs. A classic and powerful example is the impending shortage of energy in Austin in the 1970s. At the time, forward-thinking leaders from the local utility, the city government, the professional builder community, and the active citizenship realized that the alternative to building additional power plants would be to set an aggressive energy-use reduction program. These efforts spawned the Austin Energy Green Building Program, which has since grown to become one of the most successful programs of its kind in the country.¹³³ This turn of events is mirrored in recent years in California's energy crisis and the resultant energy-reduction initiatives in the state.¹³⁴

SustainLane is useful in gauging the characteristics of certain resource pressures; it ranks the 50 largest cities in the U.S. on street and freeway congestion, public transit ridership, and air-quality.¹³⁵ Furthermore, the Energy Information Administration of the Department of Energy provides state averages for the price of electricity and natural gas by end-user.¹³⁶ A more qualitative approach to understanding pressures in an area includes reading local newspapers and municipal publications. Websites such as Factiva.com are useful in locating articles pertaining to green building, sustainability, and environmental issues through keyword searches.

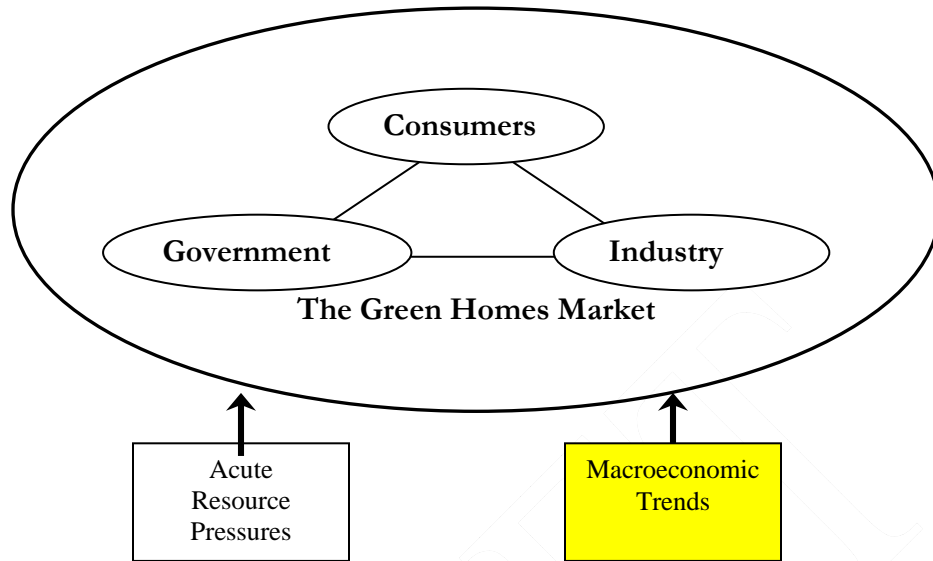
Use of the Market Engagement Framework for Acute Resource Pressures

The Market Engagement Framework's analysis component for the Acute Resource Pressure driver is composed of largely quantitative indicators that should be supplemented with a more rigorous qualitative assessment of location-specific conditions. The indicators listed below provide the easiest basis to gauge the nature and relevance of acute resource pressures in a given location, but should not be considered comprehensive due to their inability to fully encapsulate resource constraints and other pressing problems in an area.

Acute Resource Pressures: Proxies and Indicators

- Traffic, Transit, and Air
 - SustainLane: Congestion
 - SustainLane: Transit Considerations
 - SustainLane: Air quality
- Energy Costs
 - Electricity
 - Natural Gas Costs

MACROECONOMIC TRENDS



Developments should not be planned without paying close attention to macroeconomic trends of the surrounding area. These macroeconomic issues include, but are not limited to:

- Job growth rates.
- Home ownership cost fluctuations.
- Population growth or loss.
- Current housing supply and vacancy rates.
- Interest rate changes.
- Income and wage growth.
- Construction and material expenses.

These trends should be considered seriously while designing marketing and sales strategies. For instance, in a down-turned housing market in which buyers have significant bargaining power, developers and builders should look to green building techniques even more than in other circumstances in order to differentiate their products. This is particularly true for green homes that use components to provide more financial value by reducing operating costs.

It is important to note that real estate developers must focus on these trends in any business decision and are almost always included in the due diligence process. As a result, this masters' project does not investigate them in depth.

IV. MARKET METRICS LENS (MML)

To gain comprehensive understanding of the marketplace and devise appropriate entry and marketing strategies, builders and developers must investigate all three of the aforementioned elements--consumers, industry, and government--in conjunction with the resource and economic pressures influencing the overall landscape. We have developed the Market Metrics Lens (MML) as an evaluative tool to help with the complexity this investigation necessarily entails. By following a relatively simple prescriptive process, salient characteristics for each market element are identified and included as metrics in the MML. Once completed, this MML identifies strengths and weaknesses in a given market and can compare one location to another. Furthermore, it identifies specific partnership and marketing strategies used to raise overall awareness and advance the industry, topics discussed in detail in Sections VI and VII of this report, respectively. The Market Metrics Lens can be viewed as Table 2 in the following pages.

Metrics for the consumer element are easily quantifiable, whereas the metrics under the government element are more qualitative in nature. The industry element possesses a mix of qualitative and quantitative metrics. The dual quantitative/qualitative characteristic of the MML is intentional and highlights the fact that the MML is not provided to be used as a scorecard that proposes a method of weighting metrics with respect to one another. For instance, *The New York Times* readership can not be weighted equally to access to Whole Foods' markets or to the existence of a strong green building program in the local government. Rather, the intent of the MML is to provide a snapshot of the landscape and to highlight strengths and weaknesses that are most prevalent. No mathematical algorithm can be effective at evaluating the intricate nature of the green building marketplace. The MML is a tool used for an informed evaluation using quantitative data and qualitative information; it is a guide for developers interested in gauging residential green building activity and growth potential in a variety of locales.

The Market Metric Lens has been piloted in four different geographic locations: (1) Los Angeles/southern California; (2) Houston/Texas; (3) Miami/South Florida; and (4) Newark/northern New Jersey. Many of these locations consist of a conglomerate of multiple cities, townships, and other municipalities, a characteristic that further complicates a strictly quantitative evaluation. As such, a few metrics, particularly those under the industry and government sections, mention attributes of adjacent, but equally relevant, locations. The results of the pilot study for each of the four locations are discussed in detail below, with the exception of the *consumer* proxy analysis results, which are all quantifiably tabulated in Table 2 on the following pages. Evaluation and interpretation of all metrics, including analysis of the interplay and relative strength of each element (consumers, industry, and government), are included in Section V of this report. The full MML table for these four pilot geographies, as well as four comparative geographies, is shown in Table 2. The following section simply provides a snapshot of the industry and government elements in relative isolation, and should be viewed concurrently with the Market Metric Lens spreadsheet.

In addition to the qualitative and quantitative nature of the MML, only a limited number of potential proxies were used to assess each of the elements of a green homes market. Particularly in the consumer element, numerous potential proxies address the attributes of each of the three elements that make a strong residential green building market. Efforts were made to select proxies and indicators that would most directly characterize each attribute while avoiding significant duplicability. In addition, the proxies and indicators that make up the MML are largely readily available and easy to obtain at little or no cost through public websites or common library resources. For instance, although television viewership was discovered to be a strong potential proxy for the most likely green home buyer, acquiring consumer data at a metropolitan level is fairly costly. Conversely, readership is relatively easy and inexpensive to obtain at many libraries and effectively captures similar consumer characteristics to TV viewership. In other areas, such as socially responsible investing, geographical trend data is highly proprietary. As such, the MML is a robust but not comprehensive compilation of proxies and indicators to assess the strength of the three key elements of a green homes market.

The MML is a relative analysis tool. Therefore, it is necessary to interpret analysis results for any one city only in comparison to other cities. Therefore, proxies and indicators for each of the four pilot cities are presented below, but interpretation of the data is compiled collectively into Section V.

Table 2: The Market Metric Lens

No.	PROXY / INDICATOR	PILOT CITIES					COMPARISON CITIES				Metric used
		Los Angeles, California (90001)	Houston, Texas (77001)	Miami, Florida (33010)	Newark, New Jersey (07101)	Denver, Colorado (80265)	Indianapolis, Indiana (46204)	Atlanta, Georgia (30301)	Boston, Massachusetts (02109)		
Normalizing Data											
C1-3-1	City Population	3,844,829	2,016,582	386,417	280,666	557,917	784,118	470,688	559,034	By city	
	MSA Population	12,923,547	5,280,077	5,422,200	18,747,320	2,359,994	1,640,591	4,917,717	4,411,835	By MSA	
	Total Population Aged 25+	7,989,287	3,208,707	3,587,485	12,305,512	1,515,084	1,038,093	3,104,099	2,928,558	By MSA	
	Households per County	3,133,774	1,205,516	776,774	283,736	239,235	352,164	321,242	278,722	By county	
	County Name	Los Angeles	Harris	Dade	Essex	Denver	Marion	Fulton	Suffolk		
	Number of housing units authorized in 2006	155,419	216,755	205,711	32,566	39,314	28,315	98,843	19,805	By state	
C CONSUMER DEMAND PROXIES											
C1 Purchases of "Green" Products											
C1.1 Hybrid Vehicles											
C1.1-1	Hybrid Vehicles - total number sold			x	x	4,954	x	3,559	7,795	Total number of cars by MSA (sales, 2006)	
C1.1-2	Hybrid Vehicles per 1,000 Households	30,989	3,288			3.5					
C1.1-3	Hybrid vehicles per 1,000 Residents (by MSA)	5.6	0.82	x	x	2.10	x	0.72	1.77		
C1.2 Healthy Foods & Beverages											
C1.2-1	Whole Foods (Existing Stores)	17	4	6	2	1	0	4	5	Total number of existing stores by city	
C1.2-1a	Whole Foods (Stores in Development)	8	1	4	2	1	0	0	0	Number of stores in development by city	
C1.2-2	Celestial Seasonings	149	21	129	276	86	10	81	155	Total No. of Natural Food Stores (25 mile radius)	
C1.2-2a	Celestial Seasonings: Natural Food Stores / 10,000 residents (city)	0.39	0.10	3.34	9.83	1.54	0.13	1.72	2.77		
C1.2-2b	Celestial Seasonings: Natural Food Stores / 10,000 residents (MSA)	0.12	0.04	0.24	0.15	0.36	0.06	0.16	0.35		
C1.2-3	Stonyfield Farm	19	7	20+	20+	20+	12	20+	20+	No. of Natural Food Stores (25 mile radius)	
C1.2-3a	Stonyfield Farm	0	1	19	15	4	0	8	14	No. of Wholesale Clubs & Specialty Shops (25 mile radius)	
C1.2-4	SustainLane: Local Food and Agriculture	36	44	45	N/A	10	31	39		Ranking among top 50 cities (lower is better)	
C1.3 Natural/Organic Personal Care											
C1.3-1	Aveda (# of Stores)	5	2	2	10	3	1	5	5	# of Aveda Stores in 25 mile radius	
C1.3-1a	Aveda (# of Salons/Spas)	20 at 14 mi	20 in 25 mi	17 in 25 mi	20 in 12 mi	20 in 8 mi	20 in 14 mi	20 in 9 mi	17 in 25 mi	# of Aveda Salons/Spas at given radius	
C1.4 Cleaning Supplies & Household Products											
C1.4-1	Seventh Generation	108	8	5	51	22	4	18	21	# of stores that sell products in 20 mile radius	
C1.4-1a	Seventh Generation: Stores / 10,000 residents (city)	0.28	0.04	0.13	1.82	0.39	0.05	0.38	0.38		
C1.4-1b	Seventh Generation: Stores / 10,000 residents (MSA)	0.084	0.015	0.009	0.027	0.093	0.024	0.037	0.048		
C2 Readership & Viewership											
C2.1 Magazines											
C2.1-1	Better Homes & Gardens (House-Hold %)	144,471	66,710	21,865	11,178	9,331	21,061	22,059	7,185	August 2005 Circulation	
C2.1-1a	(HH %)	4.61%	5.53%	2.81%	3.94%	3.90%	5.98%	6.87%	2.58%		
C2.1-2	National Geographic (HH %)	142,406	50,066	29,280	10,049	15,219	13,775	16,988	11,416	Sept 2005 Circulation	
C2.1-2a	(HH %)	4.54%	4.15%	3.77%	3.54%	6.36%	3.91%	5.29%	4.10%		
C2.1-3	Good Housekeeping (HH %)	76,676	35,009	13,798	11,761	5,078	12,996	12,141	6,124	March 2006 Circulation	
C2.1-3a	(HH %)	2.45%	2.90%	1.78%	4.15%	2.12%	3.69%	3.78%	2.20%		
C2.1-4	Newsweek (HH %)	106,853	31,084	21,682	8,242	9,755	9,941	19,310	11,165	February 2005 Circulation	
C2.1-4a	(HH %)	3.41%	2.58%	2.79%	2.90%	4.08%	2.82%	6.01%	4.01%		
C2.1-5	Prevention (HH %)	58,523	22,083	11,875	5,880	4,306	7,054	7,583	4,389	August 2005 Circulation	
C2.1-5a	(HH %)	1.87%	1.83%	1.53%	2.07%	1.80%	2.00%	2.36%	1.57%		
C2.1-6	Cooking Light (HH %)	40,089	17,778	6,374	3,783	9,194	4,526	10,088	5,244	Jan/Feb 2006 Circulation	
C2.1-6a	(HH %)	1.28%	1.47%	0.82%	1.34%	3.34%	1.29%	3.14%	1.88%		
C2.1-7	Martha Stewart (HH %)	57,569	17,477	7,591	4,273	4,017	4,623	6,798	5,170	October 2005 Circulation	
C2.1-7a	(HH %)	1.84%	1.45%	0.98%	1.61%	1.68%	1.31%	2.12%	1.85%		
C2.1-8	Parents (HH %)	47,057	20,011	9,506	6,038	2,907	6,117	6,420	3,385	May 2006 Circulation	
C2.1-8a	(HH %)	1.50%	1.66%	1.22%	2.13%	1.22%	1.74%	2.00%	1.21%		
C2.1-9	Men's Health (HH %)	57,210	21,057	11,539	6,703	5,424	6,422	13,177	5,042	March 2006 Circulation	
C2.1-9a	(HH %)	1.83%	1.75%	1.49%	2.36%	2.27%	1.82%	4.10%	1.81%		
C2.1-10	Money (HH %)	53,628	20,778	10,490	5,618	5,951	5,122	10,683	3,943	March 2006 Circulation	
C2.1-10a	(HH %)	1.71%	1.72%	1.35%	1.98%	2.49%	1.45%	3.33%	1.41%		
C2.1-11	Fitness (HH %)	45,058	15,450	9,105	4,461	3,345	4,510	7,417	4,212	February 2006 Circulation	
C2.1-11a	(HH %)	1.44%	1.28%	1.17%	1.57%	1.40%	1.28%	2.31%	1.51%		
C2.1-12	Self (HH %)	45,262	13,270	7,582	4,705	3,942	4,337	7,549	6,772	March 2006 Circulation	
C2.1-12a	(HH %)	1.44%	1.10%	0.98%	1.66%	1.65%	1.23%	2.35%	2.43%		
C2.1-13	Health (HH %)	35,519	12,172	6,270	3,337	5,275	3,499	4,863	3,457	Jul/Aug 2005 Circulation	
C2.1-13a	(HH %)	1.14%	1.01%	0.81%	1.18%	2.20%	0.99%	1.51%	1.24%		
C2.1-14	Sierra Club Magazine (HH %)	38,104	4,007	2,697	2,331	3,685	1,327	3,231	2,132	Jul/Aug 2005 Circulation	
C2.1-14a	(HH %)	1.22%	0.33%	0.35%	0.82%	1.54%	0.38%	1.01%	0.76%		
C2.2 Newspapers											
C2.2-1	New York Times (No. Household Subscriptions in Designated)	34,585	10,576	18,827	633,330	12,584	3,755	16,669	48,847	Sept 2005 Daily Circulation to DMA	
C2.2-1a	(% by Designated Market Area)	0.52%	0.46%	1.02%	7.03%	0.73%	0.30%	0.67%	1.70%	Sept 2005 Daily Circulation as %	
C2.2-2	Wall Street Journal (# Household Subscriptions in MSA)	114,341	44,088	50,108	281,325	23,984	11,181	42,293	79,705	February 2005 Daily Circulation to MSA	
C2.2-2a	(% by MSA)	2.51%	2.30%	2.32%	3.86%	2.49%	1.66%	2.31%	4.36%	February 2005 Daily Circulation as %	
C3 "Green Construction" Conceptual Exposure											
C3.1	Articles In Local Area Papers (last calendar year: Feb-Feb)	40	25	70	50	150	36	36	80	Articles in local area papers about green construction in last	
C4 Education											
C4.1-1	No. of residents with Bachelor's Degrees (Highest level of attainment)	1,528,813	595,670	633,074	2,541,259	363,286	200,832	706,162	668,268	# in MSA	

Residential Green Building: Identifying Latent Demand and Key Drivers for Sector Growth

No.	PROXY / INDICATOR	PILOT CITIES				COMPARISON CITIES				Metric used
		Los Angeles, California (90001)	Houston, Texas (77001)	Miami, Florida (33010)	Newark, New Jersey (07101)	Denver, Colorado (80265)	Indianapolis, Indiana (46204)	Atlanta, Georgia (30301)	Boston, Massachusetts (02109)	
C4.1-2	No. of residents with Graduate or Professional Degree (Highest level of attainment)	816,308	297,217	354,933	1,747,050	193,892	102,937	359,022	520,433	# in MSA
C4.1-3	% of residents Age 25+ with Bachelor's or Above	29.4%	27.8%	27.5%	34.8%	36.8%	29.3%	34.3%	40.6%	% of residents Age 25+
C4.1-4	% with just Bachelor's Degrees	19.1%	18.6%	17.6%	20.7%	24.0%	19.3%	22.7%	22.8%	% of residents Age 25+
C4.1-5	% with Graduate or Professional Degree	10.2%	9.3%	9.9%	14.2%	12.8%	9.9%	11.6%	17.8%	% of residents Age 25+
I INDUSTRY PROXIES / INDICATORS										
I1 Green Building Associations / Coalitions										
I1.1-1	Residential Green Building Programs Existence	California Green Builder (HBA)	Houston Green Building Initiative (HBA)	Florida Green Building Coalition, Inc. (NP); Build Smart (FPL)	None found	Built Green Colorado (HBA)	None found	Earth Craft House (HBA/NP)	None found	Existence
I1.1-1b	Year founded	2001	?	2001	None found	1995	None found	1999	None found	Year founded
I1.2-1a	Green Building Organizations Existence	Global Green USA (Santa Monica)	Houston Advanced Research Center (HARC)	Florida Solar Energy Center (FSEC) - University of Central Florida	None found	None found	None found	Envirosense Consortium, Inc. - - - - - Southface	The Green Roundtable	Existence
I1.2-1b	Year founded	1993	1983	?	None found	None found	None found	?	1998	Year founded
I1.3	USGBC Chapter	Orange County	Houston	Florida Gulf	New Jersey	Colorado	Indiana	Atlanta	None	Existence
I1.4	USGBC organizational memberships	78	97	37	7	89	38	100	78	By city name
I2 Market Penetration										
I2.1	LEED existing buildings	6	4	0	0	9	0	13	9	By city name
I2.2	LEED registered projects									By city name
I2.3	Energy Star Homes (market penetration %age of new homes built in 2005)	38	42	9	1	30	6	41	23	By state
I2.4	SustainLane: Green (LEED) Buildings (Ranking: lower is better)	30	29	33	N/A	14	42	1	7	Ranking among top 50 cities (lower is better)
I2.5	SustainLane: Green Economy (Ranking: lower is better)	20	24	N/A	N/A	6	33	N/A	12	Ranking among top 50 cities (lower is better)
I3 Green Building Service Providers										
I3.1-1a	USGBC LEED APs	-500	-650	-100	-35	-450	-75	-1000	-725	By city name
I3.1-1b	LEED APs per 1,000 residents	0.13	0.32	0.26	0.12	0.81	0.10	2.12	1.30	By state
I3.2-1a	Energy Star Site-Built Home Builders & Developers	185	492	132	109	104	121	70	109	By state
I3.2-1b	Energy Star Site-Built Home Builders & Developers per 1,000 housing units authorized in 2006	1.06	2.27	0.64	3.35	2.65	4.27	0.71	5.30	By state
I3.2-2a	Energy Star Home Energy Raters	5	24	5	6	9	8	11	6	By state
I3.2-2b	Energy Star Home Energy Raters per 1,000 housing units authorized in 2006	0.03	0.11	0.02	0.18	0.23	0.28	0.11	0.30	By state
I3.2-3a	Energy Star Lenders (mortgages)	12	9	8	6	9	10	8	4	By state
I3.2-3b	Energy Star Lenders (mortgages) per 1,000 housing units authorized in 2006	0.08	0.04	0.04	0.18	0.23	0.35	0.08	0.20	By state
I3.2-4a	Energy Star Utilities / Sponsors	8	5	7	6	4	4	5	10	By state
I3.2-4b	Energy Star Utilities / Sponsors per 1,000 housing units authorized in 2006	0.05	0.02	0.03	0.18	0.10	0.14	0.05	0.50	By state
G GOVERNMENT PROXIES / INDICATORS										
G1 Government & Planning Authorities										
G1.1	Discrete city-level sustainability committees and/or departments	Yes - Sustainable Design Implementation program	None found	Yes - Mayor's Green Commission	None found	Yes - Greenprint Denver	None found	None found	Yes - City Environment Department - runs High Performance	existence
G1.2	SustainLane: Knowledge Base (Ranking: lower is better)	17	29	N/A	N/A	1	17	N/A	17	Ranking among top 50 cities (lower is better)
G1.3	Kyoto Buy-In from Leadership (Mayor)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Signed agreement with US Council of Mayors
G1.4	SustainLane: City Innovation (Ranking: lower is better)	7	19	N/A	N/A	7	26	N/A	19	Ranking among top 50 cities (lower is better)
G1.5	SustainLane: Planning / Land Use Density / Sprawl / Green Space (Ranking: lower is better)	21	44	24	N/A	17	47	50	3	Ranking among top 50 cities (lower is better)
G2 Incentives, Targets, & Mandates										
G2.1	Fast-tracking for green or LEED	Yes (Santa Monica)	None found	Yes (Dade County)	None found	None found	None found	None found	None found	existence
G2.2	Density bonuses (Floor-to-Area Ratios)	None found	None found	None found	Yes (Cranford)	None found	None found	None found	None found	existence

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No.	PROXY / INDICATOR	PILOT CITIES				COMPARISON CITIES				Metric used
		Los Angeles, California (90001)	Houston, Texas (77001)	Miami, Florida (33010)	Newark, New Jersey (07101)	Denver, Colorado (80265)	Indianapolis, Indiana (46204)	Atlanta, Georgia (30301)	Boston, Massachusetts (02109)	
G2.3	Taxes credits, grants	Yes (Santa Monica) & affordable (LA)	None found	None found	None found	None found	None found	None found	None found	existence
G2.4-1	Target for public buildings	LEED Certified (LA & Long Beach); Silver (Santa Monica)	None found	In process - TBD	LEED Silver (Cranford & Princeton)	LEED Silver	None found	None found	LEED Silver	existence
G2.4-2	Requirement for public buildings	(LA & Long Beach)	None found	TBD	(Cranford)	LEED Silver	None found	None found	LEED Silver	existence
G2.4-3	Target for private buildings	LEED Silver (Long Beach)	None found	In process - TBD	None found	None found	None found	None found	LEED Silver	existence
G2.4-4	Requirement for private buildings	LEED Silver (Long Beach)	None found	In process (updating building code)	None found	None found	None found	None found	LEED Silver	existence
G2.4-5	State Level Support / Requirements	CA req. for state buildings to be LEED	None found	All new state buildings must be LEED	No requirements, but numerous state support programs	LEED-EB & NC adopted	None found	None found	Considering LEED adoption	existence of requirements
AP	ACUTE RESOURCE PRESSURES (Proxies / Indicators)									
AP1	Land / Transit / Air									
AP1.1	SustainLane: Congestion									Ranking among top 50 cities (lower ranking means less congestion, higher ranking means more congestion)
		49	44	35	N/A	36	21	45	33	
AP1.2	SustainLane: Transit Considerations (regional ridership)									Ranking among top 50 cities (lower ranking means better transit, higher ranking means poor transit)
		8	12	13	N/A	19	40	10	3	
AP1.3	SustainLane: Air Quality									Ranking among top 50 cities (lower ranking means less pollution, higher ranking means more pollution)
		49	40	10	N/A	14	41	39	22	
AP2	Energy Costs									
AP2.1	Electricity (Cents/kWh)	14.48	11.54	11.21	12.46	8.42	7.83	8.31	16.94	State Residential Avg. (Dec. 2006)
AP2.2	Natural Gas (\$/thousand ft ³)	10.94	9.97	19.02	14.51	8.05	10.29	14.13	16.28	Jan 2007 Avg. Residential Natural Gas prices by State

LOS ANGELES/SOUTHERN CALIFORNIA

Consumers

See Table 2 on pages 42-44.

Industry

Los Angeles is a complex city and the green building industry interactions are no different. While there is a great deal of green building activity going on in L.A., given the size of the metropolis, there is not as much as one might expect.

The city of Los Angeles has roughly 500 registered LEED APs, one of the largest enclaves in the country, but a relatively small number per capita (only 1.3 LEED APs per 10,000 residents), despite the prominent USGBC Los Angeles and Orange County chapters. However, green building is well known throughout the state. In addition to the many green building programs (such as those described below) and successful developments, the Energy Star brand has had a high market penetration in California at 12%.¹³⁷ The state also has a relatively high absolute number of Energy Star-related professionals, even though the number is low in relation to the number of new housing units authorized in 2006.¹³⁸

In California, industry groups, homebuilder associations, and non-profit organizations play a large role in residential green building. Build It Green and California Green Builder are two such programs.

Build It Green's mission is to "promote healthy, energy and resource-efficient buildings in California"¹³⁹ primarily through technical assistance and trainings about green building and by linking the many various stakeholders in the home-building process. The organization also provides an online "AccessGreen" directory for finding green products and suppliers, as well as guidance regarding the LEED for Homes program's complexities and benefits.

California Green Builder is an industry-driven coalition of builders promoting "cost-effective green building . . . for production builders and California homebuyers."¹⁴⁰ The California Green Builder standard is geared towards setting achievable minimums as opposed to high-bar targets for green homes.

A number of developers are attempting to embrace the opportunities related to residential green building beyond the confines of a green homes program. Rancho Mission Viejo's current premier development, Ladera Ranch, is building off green homes' successes as they achieved in their Terramor development. Similarly, the national homebuilder Lennar has established Heritage Fields, LLC, to develop the former El Toro airport base as a sustainably focused, transit-oriented development to be known as the Great Park. Both companies draw on the expertise of CTG Energetics, a specialized green building and design consulting firm that has developed a Sustainable Communities Model™ to guide developers through the decision-making process of weighing the various aspects of triple-bottom-line real-estate planning.¹⁴¹

Government

Los Angeles and surrounding cities have enacted a number of policies and programs to promote green building in a variety of sectors, including the residential market.

City of Los Angeles

The city has signed onto the U.S. Mayors Climate Protection Agreement.¹⁴² The Los Angeles' Environmental Affairs Department has initiated and participated in a number of green building initiatives, including the Sustainable Design Implementation Program, the Residential Rehabilitation program, the Deconstruction Program, and the Brownfields Program.¹⁴³ In April 2003, the city launched the Sustainable Building Initiative, encompassing a public- and private-sector action plan to promote sustainable building.¹⁴⁴ Other important policies and programs include:

- In April 2002, the Los Angeles City Council voted in favor of requiring LEED certification of all public works construction projects 7,500 gsf or larger. As of July 2003, all building projects funded by the city are required to be LEED certified.¹⁴⁵
- The Los Angeles City Council created the Sustainable Design Task Force in 1995, to incorporate environmentally sensitive design features into the city's new construction and remodeling projects. The Sustainable Design Implementation Program, under the purview of the City Architect, was formed in July 2000. Since then, the program has received grant funding, provided training and seminars on green building for city staff, and assisted in the incorporation of sustainable-design measures in city projects.¹⁴⁶
- The Environmental Affairs Department partnered with Global Green USA to develop a residential rehabilitation guidebook, and has sponsored training workshops in deconstruction. The Housing Department, in response to the Statewide Tax Credit Allocation Committee's policy to provide credits for green building practices, is working to augment its affordable housing program by incorporating green building development criteria.
- The city's Housing Authority is examining how to implement sustainable design into its new housing projects.¹⁴⁷
- In March 2002, LEED certification of new construction projects was approved as part of the \$1.6-billion bond proposition funding building projects on the nine campuses of the LA Community College District.¹⁴⁸

Neighboring Cities' Policies

Neighboring cities' policies that may influence Los Angeles include:

- Santa Monica: In 2000, the City Council adopted an ordinance requiring all new city projects to achieve LEED-Silver certification.¹⁴⁹
- Santa Monica: In April 2004, the city launched a grant program that provides a financial incentive for private developers who achieve LEED certification.¹⁵⁰
- Santa Monica: In August 2005, the city passed an ordinance allowing LEED-registered projects to receive expedited permitting. This includes all LEED for New Construction, Homes, Core, and Shell.¹⁵¹
- Long Beach: With a policy goal of LEED Silver, the City of Long Beach Green Building Policy, approved in June 2003, requires LEED certification for new municipal construction over 7,500 square feet. In November 2006, the city adopted New Green Building Guidelines for Private Development requiring residential/mixed use projects containing 50 or more housing units and private commercial/industrial projects of 50,000 square feet or more to have either registered their building with USGBC with the intent to certify or provided third-party verification that LEED requirements for certification have been met in the final building design.¹⁵²

According to SustainLane, in 2006, out of the 50 largest cities in the U.S., Los Angeles ranked seventh in “city innovation,” 21st in “land use planning,” and 17th in “knowledge base.”¹⁵³ As of 2005, the City of Los Angeles was the top local government owner of LEED Certified green buildings.¹⁵⁴ The Engineering Department reports that they are currently overseeing at least 47 development projects that are or will be adhering to LEED standards.¹⁵⁵

California State Government Initiatives and Policies

- In December 2004, Governor Schwarzenegger signed Executive Order #S-20-04, requiring the design, construction, and operation of all new and renovated state-owned facilities to be LEED Silver. The state is pursuing LEED for New Construction for its building projects, and the Silver-certification level and LEED for Existing Buildings certification for existing facilities.¹⁵⁶
- The Green Action Team was established to ensure progress toward the goals of Executive Order S-20-04 and the accompanying Green Building Action Plan. The interagency team is chaired by the Secretary of the State and Consumer Services Agency, and the rest of the team is composed of the Director of the Department of Finance, and the Secretaries of Business, Transportation, and Housing; Environmental Protection; Resources; Education, and a commissioner from the California Public Utility Commission. The Green Building Action Plan states that the

Green Action Team, in cooperation with other agencies and organizations as appropriate, shall oversee and direct progress toward the goals of the Green Building Order, and shall recommend any additional actions, mandates, or legislation that may be warranted to ensure progress consistent with the Green Building Order.¹⁵⁷

- Executive Order S-20-04 calls for a 20% reduction in electricity consumption in state buildings by 2015. Reaching that goal will include a combination of benchmarking the energy efficiency of state buildings and commissioning or retro-commissioning facilities to ensure that energy systems are operated as efficiently as possible.¹⁵⁸

HOUSTON/TEXAS

Consumers

See Table 2 on pages 42-44

Industry

Houston currently has a strong grouping of green building professionals. Not only is Energy Star market penetration very high (31%), but there are also a large number of Energy Star-certified professionals in the city. Similarly, there are roughly 650 LEED APs in Houston, or about three per 10,000 residents. Although there are nearly 100 organizations registered as members of the USGBC, there are only four existing LEED buildings in the city.

In addition to the Houston chapter of the USGBC, there is a Green Building Initiative (GBI) chapter. Another local green building organization is the Houston Advanced Research Center (HARC), a non-profit “dedicated to improving human and ecosystem well-being through the application of sustainability science and principles of sustainable development.”¹⁵⁹

Sam Rashkin, National Director of Environmental Protection Agency Energy Star Homes, says that Houston’s utilities have developed strong marketing support for green building and play a large role in raising consumer awareness.¹⁶⁰

Government

City of Houston

Houston has limited policies and programs supporting green building, and none that directly address residential green building. The city has not signed onto the U.S. Mayors Climate Protection Agreement.¹⁶¹ The city has a LEED-Silver target, but not a mandate for city construction: “The city adopted *Green Building Resolution #2004-15* in June 2004, stating that all city-owned buildings and facilities over 10,000 sq. ft. shall use LEED to the greatest extent practical and reasonable with a target of LEED-Silver certification.”¹⁶²

According to SustainLane, in 2006 Houston ranked 19th in “city innovation,” 44th in “land use planning,” and 29th in “knowledge base.”¹⁶³

Texas State Government Initiatives and Policies

Texas has a Sustainable Building Design Initiative run by the State Energy Conservation Office (SECO), as well as a separate school design program: “SECO's Sustainable Building Design Initiative encourages and supports state agencies, architects, and contractors in designing and constructing sustainable buildings that consume less fossil fuel, limit environmental impacts, and improve worker health and productivity.”¹⁶⁴

MIAMI/ SOUTH FLORIDA

Consumers

See Table 2 on pages 42-44.

Industry

Industry in South Florida has made a demonstrable effort to increase green building, resulting in a noticeable up-tick in activity in the residential market. The Florida Green Building Coalition (FGBC) plays an important role in this process, providing guidance to homebuilders in accordance with the NAHB's efforts, as well as a “Home Designation Standard Checklist” for residential green building.¹⁶⁵

The FGBC works with Florida developers such as WCI Communities and SMR Communities, both of which have incorporated green building into much of their activities. The former has built the greenest home in the state (according to the FGBC's scoring checklist) and made it a learning location and model home for potential homebuyers to investigate.¹⁶⁶ WCI has also certified the 1,039-acre Venetian Golf and River Club as a green residential development according to FGBC's standards. SMR has designated its up-coming 9,742-acre, master-planned development phase of Lakewood Ranch to become the largest certified green development in the state.¹⁶⁷ Even with these developers pushing ahead, Eric Martin, Chairman of the Homes Committee for the FGBC and Senior Research Engineer at the Florida Solar Research Center, states that most of the Florida production builders have not bought in to green building yet. He attributes this to a lack of familiarity with green techniques and technologies, but sees custom builders, homeowners, and architects showing more interest in incorporating green.¹⁶⁸

Florida also has four USGBC chapters, three of which are in the southern half of the state: South Florida, Florida Gulf Coast, and Central Florida. Miami has only about 100 registered LEED APs and only 37 organizational members¹⁶⁹. The market penetration rate by Energy Star Homes is very low, at less than 3%, and the relative number of Energy Star professionals in comparison to residential building units approved is also low.¹⁷⁰

Still, the Florida Power and Light utility (FPL) is very proactive regarding renewable energy. FPL, a for-profit utility located in South Florida, takes a strong stance on using renewable energy within its portfolio, publishes on-going sustainability reports, and, on its

environmental stewardship programs, partners with organizations such as the World Wildlife Fund.¹⁷¹ FPL has initiated its own energy-efficient, new-home certification program, called BuildSmart. This program partners with builders to offer more energy-efficient options in their home product, which result in 10%-30% energy savings over conventional homes. FPL also provides inspection, certification, sales-staff training, and marketing support to BuildSmart partners. Their website lists 27 partners active in the Miami region.¹⁷²

Government

City of Miami

Miami has enacted a number of policies and programs to promote green building in a variety of sectors, including residential building. Lately, green building appears to be of particular interest to Mayor Manny Diaz, whose goal is to make Miami “one of the cleanest, greenest, and environmentally conscious cities in the world.”¹⁷³ The city has signed onto the U.S. Mayors’ Climate Protection Agreement and has its own Urban CO2 Reduction Program focusing on smart growth, transit-oriented development, and green buildings.¹⁷⁴ Miami-Dade County also has a fast-track permitting ordinance for certified green building in the commercial, industrial, and residential sectors.¹⁷⁵ When announcing the ordinance, Commissioner Sorenson explained: “Creating an expedited review for environmentally superior designs not only rewards those builders willing to make better homes and offices, but makes an important statement about the direction we should be heading as a community.”¹⁷⁶ In another major policy development, Miami Mayor Manny Diaz announced at a December 2006 Green Building Forum that, as major element of his Miami Green Commission, the city would be pursuing the implementation of energy-efficient, green building standards in the city building code¹⁷⁷

According to SustainLane, in 2006 Miami ranked 24th in “land use planning.” Information was not available on “city innovation” and “knowledge base.”¹⁷⁸

Florida State Government Initiatives and Policies

Local initiatives have been pivotal throughout South Florida in promoting green home building. These programs, often including a focus on education and outreach to the builder community, have significantly impacted the development community, according to green building expert Eric Martin.¹⁷⁹ Florida recently incorporated LEED standards into state building construction requirements: “The Department of Environmental Protection has committed to administratively working with other state agencies to improve energy diversity, sustainability, efficiency and conservation statewide as part of Florida’s Energy Plan, released in January 2006. The commitment includes requiring that all new state government buildings meet the LEED standard.”¹⁸⁰

NEWARK/NORTHERN NEW JERSEY

Consumers

See Table 2 on pages 42-44.

Industry

The New Jersey Energy Star program has seen tremendous success, with a 36% market penetration throughout the state. In 2006, in New Jersey, there were more than three Energy Star builders or developers per 1,000 housing units authorized.

Despite having a New Jersey chapter, the USGBC has not made solid inroads in the state. There are no existing LEED buildings and only one registered project in Newark, New Jersey. There are only seven organizational members in Newark. Outside of Newark, there are five existing LEED buildings in northern New Jersey, and a total of 57 registered LEED projects throughout the state.¹⁸¹

Another interesting component of the industry landscape in New Jersey is the presence of the BASF corporate headquarters in Florham Park, a town neighboring Newark. BASF's Near-Zero Energy House in nearby Paterson, New Jersey, was awarded a "platinum" LEED for Homes designation by the USGBC, making it just the second home in the United States to receive this level of certification. BASF built the home to showcase its broad portfolio of products and technologies that can help buildings be more durable and energy efficient, and garnered positive media attention from the project. BASF's website provides detailed information on the home benefits and building science and lists the 17 industry organizations that contributed to its pilot project.¹⁸²

Lastly, evidence suggests that the overall industry landscape is gaining competencies in innovative green technologies and building practices. It has thus far benefited from large projects in neighboring Manhattan, such as the Tribeca Green and the Solaire buildings. Equipped with the skills and knowledge gleaned from these projects, service providers should be well prepared to tackle projects in New Jersey. Don Correll, President and CEO of American Water, headquartered in New Jersey, states: "Our company is dedicated to finding environmentally sound solutions to water challenges wherever we operate, and it is rewarding to be involved in five major projects at Battery Park City that are as innovative and important as these."¹⁸³

Government

City of Newark and Adjacent Towns

Newark, along with other cities in northern New Jersey, has enacted a number of policies and programs to promote green building in a variety of sectors, including residential building. Newark and other New Jersey cities have signed on to the U.S. Mayors' Climate Protection Agreement.¹⁸⁴ While no specific programs were found in Newark, interesting

initiatives were found in surrounding municipalities. Robert Wisniewski, senior technical consultant in sustainable design for MaGrann Associates of New Jersey, notes that green residential policies are spreading by word-of-mouth from municipality to municipality, and consumer awareness is rising at the same time as new municipal legislation and program creation.¹⁸⁵ A prime driver for government action has been land constraints, resulting in a focus on development policies around Smart Growth, transit-oriented development, and infill. Local- and state-planning associations have played a pivotal role.¹⁸⁶ Some notable policies and programs in northern New Jersey include:

Cranford: On November 15, 2005, the Township of Cranford adopted Ordinance No. 2005-46, requiring all township-funded facilities projects and township-owned facilities to meet LEED-Silver certification. The Township has also adopted LEED-EB for its existing facilities [and instituted a program] whereby redevelopers may request an incentive, such as a density bonus for achieving LEED certification.¹⁸⁷

Princeton: In 2005, the Princeton Borough and Township amended their master plan to encourage the use of LEED in the design, construction, and operation of all public facilities and publicly-funded projects.¹⁸⁸

Camden: The City of Camden is undertaking a number of initiatives aimed at improving its economic vitality. Critical to that effort is the provision of sufficient affordable housing (income-qualified) units. A major factor in housing affordability is the cost of energy. This project will utilize high-performance design principles and passive and active solar strategies to construct 25 housing units, which will have a near net-zero use of the utility grid supplied power, thus potentially eliminating utility costs for New Jersey's lowest income population. This program will build upon the successful 1998 Sustainable Affordable Development Pilot Project and the New Jersey Green Homes Zero Energy Homes in Atlantic City (Millennium Square) and Trenton (Bellevue Court).¹⁸⁹

New Jersey State Government Initiatives and Policies

New Jersey has implemented a number of statewide policies and programs that encourage green building. Department of Environmental Protection (DEP) is currently considering expedited permitting and increased density bonuses for commercial and residential green buildings.¹⁹⁰ The New Jersey Department of Community Affairs (DCA) also has a particular focus on green homes through its Green Building Task Force. In 2006, the DCA released the in-depth report, "An Analysis of Residential Green Building Best Management Practices."¹⁹¹ Current New Jersey policies and programs include:

In July 2002, Governor James E. McGreevey signed Executive Order #24 requiring all new school designs to incorporate LEED guidelines. The New Jersey Economic Schools Construction Corporation is encouraging the use of LEED but not

requiring certification of new projects built under its \$12 billion public school construction program.¹⁹²

The mission of the New Jersey Green Homes Office in the Department of Community Affairs, Division of Housing, is to fundamentally improve the environmental performance, energy efficiency, quality, and affordability of housing in New Jersey. Through advocacy, education, and technical assistance, the office aims to accelerate the use of innovative green-design and building technologies, raise building standards, and create consumer demand for efficient and environmentally responsible high-performance homes.¹⁹³

In an attempt to continue to raise building standards and create a consumer demand for efficient, healthy, and environmentally responsible homes, the GHO is developing the New Jersey High Performance Homes Plus Program (NJHPPH+) for market and production-rate builders (non-affordable). NJHPPH+ is a comprehensive and voluntary residential-construction rating program that will advance high-performance home building and renovation in New Jersey. The program will establish a state green building standard and promote whole-system, energy-efficient building practices among builders, and educate consumers about the advantages of these features in their homes. The program will coordinate with other national green building programs to address and emphasize bioregional issues and provide New Jersey builders and residents with a one-of-a-kind program tailored to the specific needs of the state.¹⁹⁴

The New Jersey Affordable Green program (NJAG) is a comprehensive and affordable green building and energy-efficiency program for developers building projects in coordination with Balanced Housing, State HOME funds, Low Income Housing Tax Credits, and HMFA Home Express. NJAG is the only statewide, green-affordable housing program in the country and has become a national model for green-affordable housing. It has increased the use of innovative green materials, design, and building technologies in over 2,400 affordable homeownership and rental units in the state, and has over 37 projects participating in the program.¹⁹⁵

The New Jersey Energy Star Homes program is designed to recognize and reward builders of premium, energy-efficient homes by helping them increase their profits and customer satisfaction while contributing to a cleaner environment.¹⁹⁶

V. INTERPRETATION OF ANALYSIS: CONCLUSIONS FOR FOUR TARGET GEOGRAPHIES

The four focus areas were chosen partially due to their relatively unknown green homes market potential. As such, four additional control municipalities which were believed to have varying degrees of residential green building market strength were chosen from across the

country to add to the comparison pool. Denver and Atlanta were chosen as cities with very strong green home building markets. Boston was chosen due to its strong LOHAS and educated population but relatively weak green residential market. Indianapolis was chosen due to a presumed relative weakness in all three elements of a robust green residential market. Data was collected for these four cities for the MML for comparison to the four focus cities. This comparison is presented below, based on the quantitative data collected and contained in Table 2 (the MML) as well as the qualitative information discussed in Section IV.

LOS ANGELES/SOUTHERN CALIFORNIA

Los Angeles has a large number of likely green homebuyers and, on a per capita basis, looks relatively strong. Los Angeles is fifth in the nation in per capita hybrid sales (5.6 per 1,000 households) and shows strong demand for healthy foods and green cleaning and personal care products. Per capita readership of publications with high LOHAS subscribership is relatively moderate, and coverage of green building in the press over the last year has been fairly weak (about 40 articles in the last year). Los Angeles has a relatively moderate proportion of residents with undergraduate or graduate education (29.4%).

Los Angeles appears relatively strong from an industry perspective. The city has mature residential green building associations and programs, a high number of LEED APs (although low per capita) and registered buildings (38), in conjunction with strong statewide penetration of Energy Star homes (12% in 2005). On a per home-permitted basis, the state is weak in terms of Energy Star providers, but the city may look different based on the strength of the other metrics reviewed above. Lastly, the city and region has had two major green residential developments which are garnering a fair amount of attention.

Los Angeles appears very strong from a government-support perspective. With city and state public-building LEED mandates and the movement of neighboring cities to include private buildings, there is a high degree of political pressure for green development. A number of programs and aggressive greenhouse gas emission reduction targets support green commercial and residential building, and neighboring communities are exploring a variety of incentive mechanisms.

Los Angeles has significant acute resource pressures, most pressing of which are poor air quality, water use constraints, high electricity costs, and traffic congestion. Combined with a high transit ridership and public understanding of climate change, attributes of green homes are easily marketable in Los Angeles.

HOUSTON/TEXAS

Due to its size, Houston has a moderate number of likely green homebuyers, but on a per capita basis, the city is relatively weak in the consumer element. Relative to Los Angeles, Denver, and Atlanta, Houston has a relatively small number of per capita hybrid sales and

relatively weak demand for healthy foods and green cleaning and personal care products. Per capita readership of publications with high LOHAS subscribership is relatively moderate to weak, and coverage of green building in the press over the last year has been very low relative to other focus areas (only about 25 articles in the last year). Lastly, Houston has a relatively small proportion of residents with undergraduate or graduate education (only 27.8%).

Houston appears moderately strong from an industry perspective. The city has residential green building associations and programs, a very high number of LEED APs (about 650) and registered buildings (42), in conjunction with extremely strong statewide penetration of Energy Star homes (31% in 2005). Houston also has strong Energy Star homes support programs at the city level.¹⁹⁷

Houston appears relatively very weak from a government-program support perspective. The city has set a target, but not a mandate, for public city buildings to pursue LEED Silver, and Houston is one of only a few cities of its size to not sign on to the Mayors' Climate Protection Agreement. While energy efficiency, through Energy Star, appears to be taking hold, there does not seem to be a holistic interest in green building in city hall.

Houston has significant acute pressures, most pressing of which are poor air quality and traffic congestion. The city is not known for proactive land-use planning or strong public transit systems. Although pressures exist, a demonstrated government willingness to address these pressures does not.

MIAMI/SOUTH FLORIDA

Per capita, Miami looks relatively weak in the consumer element. Miami is not in the top 15 markets for hybrid vehicle sales and shows relatively weak demand for green cleaning and personal care products, but shows a relatively strong demand for healthy foods. Per capita readership of publications with high LOHAS subscribership is extremely weak with the exception of newspapers, but coverage of green building in the press over the last year has been high relative to other focus areas (about 70 articles). Miami has a relatively small proportion of residents with undergraduate or graduate education (27.5%).

From an industry perspective, Miami appears relatively moderate to weak. While the region has a strong residential green building association and program, the city has only a moderate number of LEED APs and relatively few registered buildings (9), in conjunction with very weak statewide penetration of Energy Star homes (less than 3% in 2005). Outside the city, the south Florida region there are two major green residential developments garnering a fair degree of attention. Industry strength appears stronger in the region than in the city itself.

Concerning the government support element, Miami appears relatively strong. The city has an active city hall green division, an environmentally proactive mayor, and is considering LEED targets and codes for buildings. Combined with state public-building LEED

mandates and fast-track permitting in the county for green buildings, there is a high degree of political support for green development.

Miami has moderate environmental pressures, with relatively good air quality but significant traffic congestion. Combined with a moderate transit ridership and growing public understanding of climate change impacts on Florida, Miami is a mixed environment in which to market a variety of the attributes of green homes.

NEWARK/NORTHERN NEW JERSEY

From a buyer perspective, Newark and northern New Jersey are difficult to evaluate because of the area's proximity to New York City. With the availability of all the resources of Manhattan and high number of LOHAS consumers in the city, Newark and northern New Jersey has a large total population of likely green homebuyers. On a per capita basis, Newark looks relatively strong in the consumer market. The city shows relatively weak demand for green cleaning products, but a relatively strong demand for healthy foods and personal care products. Per capita readership of publications with high LOHAS subscribership is relatively strong, especially of newspapers, but coverage of green building in the press over the last year has been moderate relative to other focus areas (only roughly 50 articles). Lastly, the metropolitan statistical area (MSA) has a very high relative proportion of residents with undergraduate (20.7%) and graduate education (14.2%).

With the exception of Energy Star penetration, Newark appears relatively weak from an industry perspective. The region does not have an active residential green building association or program and the city has relatively few LEED APs (about 35) and registered buildings (1). The notable exception to industry relative weakness, largely due to state incentives, is the extremely high penetration statewide of Energy Star homes (36%) and the availability of Energy Star service providers on a total and per housing permit bases. Outside the city, the region has two major green residential developments garnering a fair degree of attention.

While Newark appears relatively weak from a government support perspective, the state appears very strong, and surrounding communities are adopting programs and mandates that will likely spread across the region. The state's efforts to promote green affordable housing are particularly noteworthy. Thus while the city itself is rather weak in government support of residential green building, the state and surrounding municipalities are relatively strong.

Northern New Jersey has a fair degree of environmental pressure to pursue green development, especially in land constraints. Public understanding of the impact of climate change on low lying New Jersey is strong, and general development pressures and the strength of long-standing smart-growth movements are good signs for the penetration of green homes into the market.

RELATIVE ANALYSIS OF FOUR TARGET GEOGRAPHIES

Of the four focus municipalities, Los Angeles stands out as the strongest in its relative strength in all three key elements of a residential green building market. While the consumer and industry elements of Miami's green residential market are relatively rather weak, the government element is relatively strong and growing. The industry element outside of the city, including a strong residential building program and the support of a leading builder (WCI), is rather strong. The consumer element of the Newark green residential market is relatively strong, while the government support element is moderate and the industry element is relatively weak. Towns in northern New Jersey and the state government are making strong progress in green residential support. While Houston has a relatively strong industry element, it ranked weakest of the four focus municipalities in government and consumer elements. See Figure 6 for a visual representation of the relatively ranked elements of the four target cities and the four comparison cities. Table 3 shows the strengths and weaknesses.

Figure 6: Market Engagement Framework Analysis

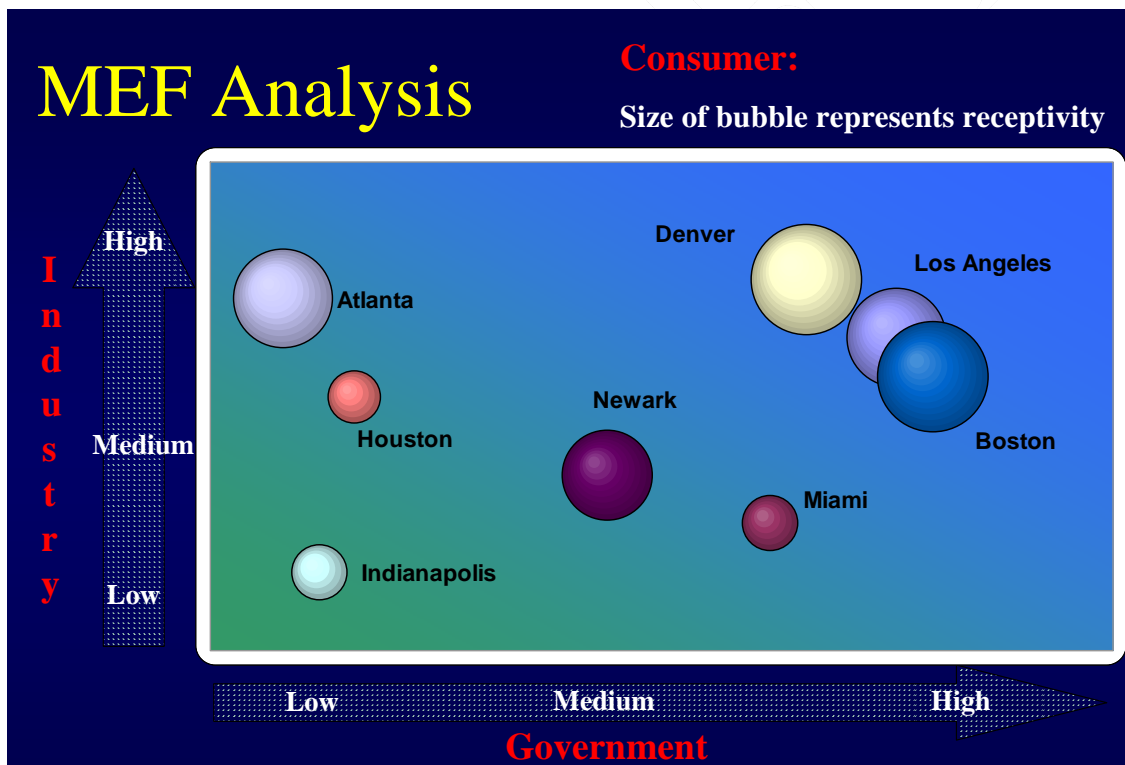


Table 3: Residential Green Building Market Strengths and Weaknesses

Strengths	
Los Angeles, CA	Hybrid sales Demand for green cleaning supplies LEED-registered projects City and State building LEED mandates
Houston, TX	LEED-registered projects USGBC organizational memberships Energy Star homes statewide penetration
Miami, FL	Demand for healthy foods Green building media coverage Mayor support for green building Fast-track permitting
Newark, NJ	Readership of publications with high LOHAS subscribership Citizens with bachelors and graduate degrees Energy Star homes statewide penetration State green home programs
Weaknesses	
Los Angeles, CA	Green building media coverage
Houston, TX	Hybrid sales Demand for healthy foods and cleaning supplies Green building media coverage Citizens with bachelors or graduate degrees Government attention to climate change Land-use planning
Miami, FL	Readership of publications with high LOHAS subscribership Citizens with bachelors and graduate degrees LEED-registered projects Energy Star homes statewide market penetration
Newark, NJ	Lack of industry programs USGBC LEED APs LEED-registered projects

VI. BUILDING PARTNERSHIPS

The two aspects of the “strategy” portion of the Market Engagement Framework are to: (1) forge partnerships to help advance the overall industry and raise consumer awareness, and (2) target purchasers of residential green homes with a focused marketing and sales effort.

After analyzing the green homes market in a given area, the developer must create a strategy to properly engage the market to successfully sell green homes. In forming this strategy, developers must consider potential partners throughout the industry and government sectors. In keeping with the process designed in the Market Engagement Framework (MEF), developers should analyze the Market Metrics Lens (MML) to gain an understanding as to which of the three elements (consumers, industry, and government) are well developed and which are weak. The developer should then consider the opportunities related to forming partnerships with those industry and government entities showing potential strength in the green homes market and complementing the developer’s own abilities.

BEST PRACTICES AND STRATEGIC RECOMMENDATIONS

The guiding principal to form these partnerships should be to find entities with aligned interests. Benefits could be achieved in the form of collaborative marketing and outreach (raising awareness and/or specific-brand strengthening), employee or sub-contractor training programs, and even simply leveraging the various skills of the many stakeholders of the home-building value chain. The EPA’s Energy Star program, for instance, has demonstrated the effectiveness of partnering in marketing and outreach efforts. It has successfully helped develop a strong consumer preference bias for the Energy Star label in many markets through a cooperative advertising model (described in more detail in Section VII).¹⁹⁸ Developers forging partnerships should not limit to focusing on homebuilders. Partners could include regional developers and builders, non-profit organizations, green building programs or certification systems, financiers, city and state officials, activist and environmental consumer groups, realtors and brokers, architects, engineers, and utility companies.

Considering the industry element specifically, companies using the MEF must seek partners that contribute to their green building goals. This means finding builders that are appropriately sized and able to build at the requisite scale, at the needed quality level, and in the necessary timeframe. In many parts of the country, this may mean striking a balance between large-scale production home builders that may not have green building experience and smaller, more skilled green building companies.

To determine the builders' dedication and experience to green building, questions a developer should ask include:

- Does the builder have an internally mandated recycling program during demolition and construction?
- Does the builder use low Volatile Organic Compound (VOC) paints and sealants as a matter of practice?
- Does the builder use a third-party commissioning or certification standard for its green homes?

By no means should these positive practices be the extent of a potential builder's green building practices. Rather, basic questions such as these should begin a conversation on goals and methods to incorporate green building into a project. Further questions should be asked in accordance with the developer's project goals. These do not have a "right" or "wrong" answer:

- If the builder uses a commissioning or certification standard, is the standard focused on reaching a minimum set of goals or reaching a high mark? Is it a nationally or locally based standard?
- Is the builder's green building practices focused on purely energy efficiency or are they focused on a holistic sustainability approach to building?
- Has the builder received any grants, funding, or public recognition of its green building efforts or completed projects?
- How do the builder's green building practices differ from other builders in the same geographic area?

In asking potential building partners both sets of questions, the developer should begin to form a comprehensive understanding of the skills, motivations, and goals of the builders in the area. Further, the builders should also be evaluated based on whether their decision-making processes are agile or slow-moving, often influenced by whether the firm is privately or publicly owned. Certainly, the dedication of the top management plays a large role in determining a company's green building practices. The results of internal efforts are affected extensively by the origin of those efforts: if they are top-down or bottom-up and if they are engrained in the corporate culture. Finally, green builders should be judged by the preconceived standards to which any builder would be held, such as reputation, cost, experience, size, and management practices.

These questions should also be applied to other industry partners, including architects, engineers, and urban planners. The developer needs simply to shift the questions to reflect the particular discipline more directly.

When engaging the government element of a green homes market, the developer should look for partners with missions, resources, staff, and policies that support green building efforts. These government resources could be a part of a city sustainability office, an urban

planning office, a zoning and development board, or any number of other local offices or associations. The key is to determine the extent of support available to green building projects, especially residential projects. This support can come in the form of fast tracking green-housing permits, increased density allowances, tax increment financing for green building, or even city and state supported green homes certification programs. With regard to the latter, it is important to determine the methods for certification (self-driven or third-party), if the program has tiers (and, if so, what the criteria are for achieving them), and who the founding and governing partners are because many programs are partnerships in and of themselves. This latter point is exemplified well by programs like the EarthCraft housing standard in Atlanta, and its parent organization, the Southface Institute. This non-profit organization has built a partnership among the local home-builders association, retailers like Home Depot, local government offices, and dozens of local builders in order to advance and promote its green building program.¹⁹⁹

THE IMPORTANCE OF CHAMPIONS

In forming partnerships, it is equally important to find strong organizations, and champions within them. Such champions often know of other champions in other area organizations and companies. Tapping into these networks helps gain a rapid understanding of leading green building practices in an area. In addition, these champions were often originally drawn to green buildings from a value-oriented perspective and would likely be considered members of the LOHAS segment.

Ultimately, this practice of asking questions and forming partnerships should become part of a developer's standard operating procedures and best practices. This process provides developers a deeper understanding into the opportunities of green building at a local level within each building market.

VII. MARKETING AND SALES STRATEGIES: BEST PRACTICES

Although ample evidence suggests that growth in the residential green building market is progressing significantly at the national level, several challenges remain at the local level and for individual developers and builders who have yet to carve out a successful niche within this field. Even for established green home builders, the desire and imperative to increase sales and profitability and to retain a share in this industry mandates robust and targeted marketing and sales efforts specific to the nature of their particular geography and consumer. For instance, certain geographic markets will possess a more robust infrastructure of industry knowledge and capabilities, consumer awareness, and government-support programs and incentives. In these more mature environments, the most effective marketing and sales strategies are inherently different from those in more emerging locations, where consumer demand and preferences, as well as stakeholder awareness, are more nascent. Ultimately, the challenge lies not in whether viable consumers for green homes exist. The

growth in the market is indicative of sufficient interest in and awareness of these products and technologies. The challenge is in how to deliver the value-proposition most effectively to the most receptive buyer.

GROWING CONCEPT AWARENESS IN NASCENT MARKETS

In any given location, a segment of the population will be quick to value the benefits and attributes of green homes and will seek out the green home specifically when purchasing a new home. Similarly, at least a small handful of dedicated builders and architects have embraced the tenets of sustainability wholeheartedly and are pushing this technology ahead of mainstream adoption. However, creating awareness among potential consumers and industry professionals who are not actively seeking knowledge and expertise in this area or are reticent to commit is vital to progressing the industry and improving market penetration. Drawing in the more mainstream consumer and engaging the more traditionally-focused builders and developers is crucial. In September 2006, Michael McGuinness, Executive Director of the National Association of Office and Industrial Properties, New Jersey Chapter, states in an article published in *New Jersey Business*:

Things have to happen at multiple levels for [green building] to become mainstream. You've got to get the word out there more often so that municipal officials and building owners say, "Oh, yeah, I know what green building is." Then, secondly, to demonstrate that, yes, this can mean some substantial cost savings and better environment and air we breathe, et cetera. Lastly, the users need to connect with vendors and say, "This is what you need to start using." [The vendors] have to be trained on how to build with this stuff and how to use this technology."²⁰⁰

McGuinness likens the awareness trends of green buildings to those of recycling or automobile seatbelt use: "Wearing your seatbelt is very mainstream now. I think we aren't quite there with the green building stuff, but we are getting there."²⁰¹ Publicity and marketing across a variety of sectors is key to narrowing the knowledge gap about green building benefits and driving take-up by multiple sectors within the industry. Greg Stine, of Polaris Inc., asserts that "Publicity through articles, events and word-of-mouth marketing builds credibility, creates a buzz and plays a big role in building a successful brand. By employing this strategy effectively, Build It Green . . . has become the go-to organization and a thought leader for the local and national media on green building. This fact isn't unrelated to their success."²⁰²

In Colorado, Built Green has achieved success by incorporating similar marketing tactics. It embarked on a three-year marketing program that helped increase their market share from 6% in 2003, to 22% in 2005. Its marketing program included television ads, consumer print ads, brochures, website information, certified-home certificates, tour home placards, internet promotion, and additional public relations such as by-lined articles in local newspapers and magazines about Built Green home builders and green building practices.

As a result, it was successful in raising the awareness of Built Green among prospective homebuyers from 34% to 46%, between 2004 and 2006.²⁰³

Furthermore, Built Green conducted a focus-group study of prospective new homebuyers and current owners in Colorado in 2004, to determine (and quantify) the perceptions of the Built Green standard related to green homes. Of those that were aware of the Built Green program, nearly four-in-ten indicated that the Built Green standard was an influence in their recent new-home purchase decision. Nearly six-in-ten indicated Built Green would influence their next new-home purchase.

The 2004 focus-group study also revealed that many of the participants equated Built Green with environmentally friendly construction, which was perceived to mean lower quality. Even if lower quality was not the perception, people generally felt that a house that was environmentally-friendly was not very meaningful, and therefore not worth any extra costs. As a result, Built Green changed their positioning statement to:

A Built Green home is a better built home. For homebuyers looking for quality, Built Green means a better built home because it's built to a higher level by dedicated builders providing quality workmanship and materials, with attention to environmental details.²⁰⁴

Built Green then tailored its marketing efforts to deliver this message and were successful in increasing the percentage of people who believed that Built Green homes are “better built” than non-Built Green homes from approximately 37% in 2004, to 45% in 2006.²⁰⁵

One of the best success stories in the green home movement comes out of Austin, Texas, where the Austin Energy Green Building Program (GBP) has been in operation since 1991. Participating builders, architects, and designers have built more than 7,000 GBP-rated homes over the past decade. One of its main initiatives was to educate the public about the value of green homes to create a preference-bias among all homebuyers. In addition to providing free marketing and publicity materials and consulting with the industry, it currently offers public green building workshops four times each year. According to Rich MacMath, an architect who has been with the GBP as Residential Program Specialist for five years, these “Green By Design” workshops were initially slow to take off but they now sell out.²⁰⁶ One of the main market-transformation publicity techniques employed by the GBP was the placement of full-page advertisements every week in the Sunday edition of the local daily newspaper. As a result, the GBP standard became a “label-of-excellence,” and consumers began asking potential builders if they incorporated these features into their homes and built them to the GBP standard.

Another successful robust marketing effort is associated with EPA Energy Star Homes. Sam Rashkin, National Director of the program, describes the basic tenets and results of its outreach campaign:

If at least 3 energy star partners, including at least two builders, agree to place energy star advertisement for 8 to 13 weeks, EPA agrees to place an advertisement for the

same 8 to 13 weeks. The results have been dramatic, both in educating the consumer and in attracting more builders to Energy Star. New builders see the partner builders getting impressive recognition and [are moved to] join on to be competitive.²⁰⁷

Such marketing and outreach is instrumental in developing a strong consumer preference that has helped progress the industry in each respective locale. An established preference bias among the consumer base will not easily fade away. In fact, it will likely grow stronger as the effects of viral-marketing and word-of-mouth advertising take hold.

SELLING GREEN HOMES

Green homes possess a variety of attributes that appeal to potential homebuyers. Consequently, a focused and targeted sales effort that addresses one type of consumer may not resonate as well with another equally desirable and viable type of consumer. However, certain characteristics of the overall market landscape in a given location will point to sales strategies that will be most effective. For instance, where the market has been identified as more nascent, with limited penetration of green homes, it is most advantageous for a first-mover builder or developer in the green home space to ensure that they capture those consumers—LOHAS, Cultural Creative, and True Blue Green—who are more inherently drawn to their new product offering. Conversely, in a more mature market, where the industry and government involvement has been more robust, sales strategies will want to capture any remaining LOHAS-type consumers as well as the more mainstream consumer. When selling to any consumer, discerning exactly which needs the buyer is most concerned with and hopes to address with their purchasing decision is essential. Is the buyer purchasing to address concerns about health, to capture energy savings, or to express a lifestyle statement? Perhaps the home is simply the right place, right size, and right price, and the green attributes are—at least initially—irrelevant to the consumer. The combination of features and benefits that resonate most effectively with the buyer obviously differ from individual to individual and from one location to the next, two aspects that are not entirely unrelated. Although certain “hot buttons” may be predominant in certain locations, variations occur at the individual level. Consequently, it is impossible to devise a “one-size-fits-all” sales strategy. However, trends and best-practices have emerged, which we have compiled into the following list.

Twelve Techniques for Selling Green Homes

1. Sell on benefits, not features.
2. Sell on total cost-of-ownership, not payback period.
3. Be authentic and knowledgeable.
4. Build relationships with consumer.
5. Demand excellence from sales staff.
6. Gain strong familiarity with geography-specific drivers.
7. Identify “Hot-Buttons.”
8. Sell using a self-selecting “Quiver-of-Arrows.”
9. Incorporate a label of excellence.
10. Bundle features into a package rather than offering options.
11. Use the environment not to drive the sales pitch, but simply to make it “stickier.”
12. Empower the buyer.

1. Sell on benefits, not features.

Promotional material and sales pitches should highlight the health benefits, energy-cost-savings, maintenance-cost-savings, increased comfort, and other benefits of a green home. Although the salesperson needs to be knowledgeable about the specific features that deliver these benefits and cost-savings, the features themselves are less likely to resonate with the mainstream consumer than are the overall benefits associated with them. In advertising language, this means “sell the sizzle, not the steak.”²⁰⁸ In more concrete terms, it is not enough to say that a house has a tight envelope. It must be emphasized that this results in lower energy bills, increased comfort in all rooms, and probably no insects. Dennis McConnell, President of McConnell Homes, an award winning custom home builder in Atlanta, has adopted the Southface Institute's EarthCraft program into its custom-home building operation. However, he indicates that having a label is not entirely sufficient to drive sales: “I can't say, ‘I'm an EarthCraft builder. Let me charge you an extra two percent.’ You have to be able to take the virtues of what you incorporate and show it as benefits and features that are valuable to a customer. ‘I can prove to you that we'll heat and cool this 4,000 square foot house for \$60 a month.’ That has a value.”²⁰⁹

2. Sell on total cost of ownership, not payback.

The term “payback period,” when applied to the home, often does not carry weight with the home-buying consumer, particularly when referring to paybacks in the 15-30 year timeframe. It is simply not a benefit that resonates well with average consumers because human nature tends to undervalue the idea of future energy cost savings, and lengthy time horizons may be meaningless when the average duration of home ownership is significantly less. The “total-cost-of-ownership” argument has a more immediate and timely implication. Furthermore, data may support the assertion that overall monthly payments on a home will be less with a quality-built green home and are enough to counter-balance any monthly

mortgage premium. For instance, if the additional price paid for a green home adds an incremental monthly mortgage premium that is *less* than the typical reduction in monthly utility bills, then espousing that argument is certainly recommended because it appeals directly to the “What does this do for me?” question from many mainstream consumers. Durability and lower-maintenance costs are other financial benefits of green homes that have high universal appeal. Conversely, Net Present Value (NPV) is likely to resonate with only a limited segment of the population.

In addition, total cost of ownership incorporates many intangible expenses and tradeoffs that are highly marketable. As green building marketing expert David Johnston, from the firm What’s Working, states:

Some in the public health industry say there is a direct correlation between the air that children breathe today and the crisis we're having in our schools with attention deficit disorder. And California has defined formaldehyde as a carcinogen. So what we start getting into is not an affordability conversation, but a MasterCard commercial. What’s the cost of a kitchen cabinet upgrade? \$275. What’s the cost of low VOC paint? \$12. What’s the cost of formaldehyde-free fiberglass? Nothing. What’s the cost of preventing your children from suffering from learning disorders? Priceless.²¹⁰

3. Be authentic and knowledgeable.

When addressing consumers potentially interested in a green home-- LOHAS/Cultural-Creative/True Blue Green type and the more mainstream consumer-- authenticity in sales and marketing messages is critical. These consumers are likely to already possess a favorable bias towards purchasing a green home and will be highly receptive to the green home message. However, because these consumers are well-informed and conscientious about their purchases, they demand a great deal from their home-builder and often think more holistically about the total sustainability of the home. They place a high value on integrity and honesty, will be quick to identify any type of green-washing, and will likely be turned away by any perceived lack of transparency. Therefore, despite what may be initially seen as an “easy-sell,” failure to recognize and cater to the unique knowledge-seeking and holistic attributes of these high-value consumers may drive them away. Barr Hall, Director of Sales and Marketing for McStain Neighborhoods, a premiere green home design and build firm in Colorado, indicates that in sales and media campaigns, it lays out all of the attributes and benefits and lets people draw their own conclusions. Hall points out, however, that it is important to refrain from being preachy: “Do not presume to tell the consumer that they should also be passionate these things. Let them come to that conclusion themselves. Let them devise their own reasons internally.”²¹¹ This holds true especially for the LOHAS consumer, one of McStain’s main target segments, but also applies to the more mainstream consumer.

4. Build relationships with the consumers.

Being able to develop some degree of a relationship with the consumer is important to solidifying the sale in ways similar to those associated with the authenticity mandate described above. Paul Ray, Executive Vice President of American LIVES indicates that sales staff “must be able to take time to talk to [LOHAS] customers and know them, to see them as friends and allies, people to share their excitement with. . . . Don’t stop with offering decent value for the money. That’s just [the] ticket to entry. . . . Get into stories, whole process and systems.”²¹²

In Colorado, McStain Neighborhoods has embraced the idea of relationship building, centering many of their outreach activity on a “Customer for Life” philosophy. In addition to hosting and organizing Halloween parties and trail-building environmental-service retreats for their homebuyers, it has also built a Discovery Center in an infill community. By inviting people to just go in, look around, and learn about the exhibits and the home features, it has both increased awareness of the benefits of green homes and fostered an element of good will within the community. Consequently, 38% of its home sales come from repeat customers and direct referrals; the national average is less than 10%.²¹³

5. Demand excellence from the sales staff.

Consumers expect sales staff to be more knowledgeable than they are regarding the product being sold, a notion that holds particular significance when selling to the LOHAS consumer. Jerry Yudelson, green building marketing expert, describes one builder’s hard-line approach of appropriately mandating that each sales person deliver a 20-minute sales pitch to potential buyers of green homes (the industry-average is only 10-minutes), or else face being fired. The rationale is the sale of a green home requires more effort and attention than that required for the sale of a traditional home. Mainstream consumers may not probe as deeply into such issues as where materials are sourced or how they are made, but will likely demand in-depth knowledge of the product in order to understand its inherent value. Conveying the message of value is paramount for builders to maintain healthy margins on their homes.

6. Target geographic-specific drivers.

Local and regional builders likely will already possess a working knowledge of the general characteristics of their potential buyers and of what drives sales in their area, but they may not connect these drivers to the benefits of green homes. Sara Lamia, a green building marketing coach in Ft. Collins, Colorado, uses an interesting technique to help her clients in the building and development community make this connection. She provides a list of all of the benefits of green homes and asks her builder-clientele to indicate those that they think will resonate most with their consumers. She then devises sales materials to speak to those interests. Similarly, existing industry knowledge and sales best practices can be leveraged in another way. For instance, if the conventional builders advocate lifestyle elements and state-

of-the-art features in their sales and promotional material, it is important to not deviate too far from those messages in green home specific marketing efforts. The idea is to link the benefits of green homes to those of conventional homes prevalent in mainstream material by taking advantage of the inherent overlaps that exist between the two. These kinds of techniques emphasize that the industry is generally aware of what sells best in its region but may be unaware of how green homes fit into the overall picture. Lastly, by using a proxy method of consumer analysis as portrayed in the MML, it is possible to characterize the consumer landscape and identify specific sales strategies. The readership statistics from the MML are especially valuable in identifying issues of interest to the consumers.

7. Identify each homebuyer's "Hot-Buttons."

It is nearly impossible to predict a person's individual needs and preferences or how the person balances those with elements of home purchase factors such as price. Thus, it becomes imperative to develop an array of materials that appeal to a variety of needs and preferences. The key is to comprehensively, creatively, and artfully demonstrate the various green elements of a home and communicate their benefits while respectfully obtaining valuable information about the consumer and insight into what is likely to drive their purchasing decision. Sam Rashkin, National Director of EPA's Energy Star Homes program, suggests that each salesperson, upon greeting a prospective homebuyer, should ask a few simple questions to get to know the consumer and what may ultimately drive a purchasing decision. Ask questions such as: "What did you like least about the home you are coming from?" and "What are you looking for most in a new home?" These provide valuable insight into which features and benefits to highlight in the sales pitch. Marc Richmond, the former manager of Austin's green building program and one of the principals behind the launch of Build It Green in California, believes green building will not sell as well to the highest income bracket based on environmental features, and asserts that any attempt to sell to them must be based more on the principles of quality or state-of-the-art.²¹⁴

8. Sell using a self-selecting "Quiver of Arrows."

Jerry Yudelson references a technique used by the large production builder, KB Home, in one of its developments. KB Home placed a green kiosk in a showroom that allowed potential homebuyers to peruse the green features and benefits of its homes. The consumer was able to navigate the kiosk at his or her leisure and could choose to dig deeper for more information on attributes most interesting to them or to skip over those that were not. Time was not wasted and consumer interest was not lost.

Another successful "show-and-tell" technique similar to the kiosk involves a more comprehensive interactive showroom that demonstrates the features of the green home. According to Rich MacMath of Austin Energy's Green Building Program, "people retain 10% of what they hear and 90% of what they experience. Demonstrations are the most effective sales tools, e.g. compact fluorescent bulbs connected to a meter, light through low-

E glass striking a radiometer, etc.”²¹⁵ Insulation cutaways and other displays that allow the consumer to directly compare green products to traditional products are also useful, as are infrared pictures that dramatically display areas in a traditional home where cold air is leaking inside. This latter example, in particular, has a significant amount of positive shock-value. By incorporating different features that speak to such benefits as durability, energy efficiency, indoor air quality and health, the showroom method of selling allows potential homebuyers to self-select those benefits that matter most to them. An aware and attentive salesperson can then focus the sales pitch on those elements that resonated most with the customer, based on which displays held their attention the longest.

Jennifer Languell, a Florida Green Building Coalition consultant and principal for the firm Trifecta Construction Services, has identified seven essential elements that comprise their “Trifecta Umbrella” and should be included in sales materials and building exhibit space. See Figure 7, at right.²¹⁶

Figure 7: The Trifecta Umbrella



9. Incorporate a “label-of-excellence.”

Designing and building homes to a national or regional standard such as Energy Star, LEED for Homes, or EarthCraft can be extremely effective in driving sales. In a more nascent market, partnering with a green building brand (or brands) conveys a message of authenticity to the discerning consumer and dispels concerns over green-washing. Furthermore, aligning with a brand should provide increased publicity and marketing because the partner organization can share or cover many of the associated costs. In a more mature market, a preference-bias already may have developed and the brand may be almost a requisite for entry, as has happened in Austin, Texas, and Denver, Colorado. In the San Francisco Bay Area, an online survey commissioned by Christopherson Homes revealed that 84% of the respondents felt that the rating of a home’s green features by an independent organization was either “very important” or “somewhat important”.²¹⁷

10. Bundle elements into a package rather than offering discrete options.

The building science behind green homes is governed by the principle that all elements of the home must function as an integrated system. Incorporating merely a few features (e.g. bamboo flooring, solar panels, etc.) does not equate to delivering a comprehensive and holistic green home. Incorporating several features that work symbiotically is also a

fundamental method of keeping costs down. Premiere green home providers, such as McStain Neighborhoods, incorporate into their homes as many aspects of sustainability as possible and deliver the entire package to their buyers, being sure to convey the “McStain Premium.” Other builders, such as Pardee Homes, acknowledge that different consumers will value different attributes and have several basic packages: Living Smart, Energy Smart, and Water Smart.²¹⁸ Similarly, the U.S. EPA has developed complementary lines to its very robust and successful Energy Star energy-centric program: an indoor air-quality package and a Water Sense label.²¹⁹ Many of the national certification programs mandate packaging and bundling because certain points in each environmental category must be attained to achieve certification up to its standards.

11. Use the environment not to drive the sales pitch, but simply to make it “stickier.”

Many experts in the industry assert that leading a sales pitch with a strictly environmental message will only be effective within a relatively small segment of the population. However, even in the case of the mainstream buyer, the environmental message can make the sales pitch become “stickier.”²²⁰ (See the MML in Section IV for specific information on acute resource pressures.) This is particularly true when the mainstream media is filled with stories on global climate change, energy security, and resource pressures. *Business Week*, *The Economist*, *The New York Times*, and *Business 2.0* have all run extensive series covering environmental issues. Even *Sports Illustrated* put global warming on the front page of its March 2007 issue. Therefore, even though the primary message delivered to the consumer should appeal to pragmatic “What’s in it for me?” reasoning, the more altruistic rationale behind buying green will resonate at least slightly due to the overall growing awareness among the general population. Maureen Moore, a resident of the coastal town Wall, New Jersey, said global warming, while worrisome, was not enough for her to switch from a company or product she really liked. Nonetheless, “if two things are similar and one is environmentally safe and one isn't, I would go with the one that's environmentally safe.”²²¹

12. Empower the buyer.

Because the features and benefits of green homes differ from those of conventional homes, educating the buyer about these differences can be an important sales technique. Green homes sales efforts should extend beyond merely informing the customer; they should provide the customer with an arsenal of questions and other techniques to take to other homes they are viewing. For instance, it is to the advantage of the green home builder for customers to ask their sales person, regardless of whether they are viewing a green home or a conventional home, if the paint contains VOCs, or if the windows have low-emissivity (low-e) coatings, or construction materials have formaldehyde as an ingredient. This technique has further appeal considering the type of consumer typically drawn to green homes. LOHAS consumers thrive on information and consider it critical to the decision-making process. They will be wary of aggressive sales techniques and will appreciate the

candor and the confidence that this sales technique exhibits. By empowering the buyer to make an informed decision in this manner, not only will the salesperson help convey the benefits of green homes, but will also foster a sense of trust and respect.

In conclusion, customers may agree in principle that homes built to a green standard are inherently good, but that alone does not always translate into a sale. However, high quality, durable, energy efficient, low maintenance, and healthy are all attributes that appeal to mainstream consumers and should be easy to market and sell. David Johnston, a green building marketing expert and President of the firm, What's Working, a green home solutions-provider and consultancy in Boulder, Colorado, calls the successful marketing of green homes "applied common sense."²²² Greg Stine, CEO and President of the marketing consultancy Polaris Inc., agrees: "The gap has started to close between the early adopters of green building and those a bit more hesitant. No longer is green building reserved for the fringe. Instead, it makes sense for everyone. In an era where depleting energy, water, and other resources affect everyone, green building is no longer about making a statement; it's becoming a standard."²²³ As green homes move into the mainstream, the adoption of these sales techniques will be critical for home builders to maintain their competitive advantages.

VIII. PARTNERSHIP, MARKETING, AND SALES STRATEGIES FOR THE FOUR TARGET GEOGRAPHIES

The Market Engagement Framework (MEF) begins with an analysis component that delves deeply into the characteristics of the three principal elements in the green homes market. Performing this analysis through the use of the Market Metric Lens (as described in Section IV) reveals both gaps in the marketplace as well as leverage points that can be harnessed to augment activity and profitability in the sector. Identifying ideal industry and government partnership opportunities and pinpointing salient consumer characteristics upon which to base a marketing and sales strategy are key components of the strategic portions of the MEF. The strategy components of building partnerships and forming marketing and sales strategies influence one another directly. For this reason, these steps have been undertaken and combined below for each of the four pilot geographies addressed in this study.

LOS ANGELES/SOUTHERN CALIFORNIA

The Los Angeles green homes market has been determined to be quite robust, with strong industry presence, high levels of government involvement, and a consumer base that will likely be highly receptive to the green home message. Partnership opportunities specific to the Los Angeles area are numerous and can be found within both the government and industry sectors. Specific suggestions include:

- Forming a relationship with the city's Sustainable Design Implementation office and gaining familiarity with the tenets of their program.
- Contacting Toyota or other manufacturers of hybrid vehicles to explore opportunities for co-branding and/or other promotional activities, latching onto the popularity of hybrid vehicles in the region. Anecdotally, accounts of a builder giving away hybrid vehicles to each new-purchaser of a green home in their development have already emerged.
- Accompanying all green activity with extensive outreach to the local media to help garner valuable free publicity. The local media appears willing to run stories related to green buildings and sustainability.
- Leveraging the broad public concern over the many acute resource pressures in California, to draw attention to the benefits of green homes, both in media publicity and in sales techniques. In southern California, benefits associated with energy efficiency, air-quality, and water reduction will resonate well with a large consumer base.
- Targeting those areas for development (or for promotion) where a Whole Foods Market is in close proximity. There are 17 Whole Foods Markets with 8 additional slated for development in the Los Angeles area. Because of the overlap in characteristics between the consumers of those food stores and those of green homes, targeting these areas is likely an effective positioning and marketing strategy.
- Contacting Rancho Mission Viejo and/or other developers active in this space to glean consumer insight and marketing best-practices.
- Seeking opportunities for knowledge-sharing and collaboration with industry players in non-competitive markets. Because of the robust activity and government support in neighboring cities, these opportunities should be ample. Green building organizations, such as Global Green USA (located in Santa Monica), should provide information on some likely candidates. Perusal of the LEED APs in the area, of which there are hundreds, should also prove effective.
- Coordinating with any of the 78 member organizations of the USGBC to help fund and advance building-science research and consumer market research. This can also be done in cooperation with the building organizations and the government entities tasked with sector advancement.
- Advertising in health and fitness magazines which enjoy a high level of readership in the area.

HOUSTON/TEXAS

The green homes market in Texas is relatively nascent. Education levels and demand for green products are lagging, the Mayor of Houston is one of the few who has yet to sign onto the Mayors Climate Protection Agreement, and prevailing land-use planning principles defy the basic tenets of green construction. However, despite relative lack of activity in the government and consumer sectors, the industry sector has begun to organize itself and is showing signs of significant potential with regard to advancing the green building movement. Specific recommendations for partnerships and marketing include:

- Framing a relationship with the USGBC chapter and the Houston Advanced Research Center to spread concept awareness throughout the city and develop skill competencies within the building community.
- Refraining from incorporating environmentally-focused messages into sales and marketing material. General awareness and concern appears to be relatively weak, judging from lagging purchasing behavior across a variety of green products. Conversely, messages that address particular common concerns of Houston residents such as air-pollution and traffic congestion will likely be well received and much more effective.
- Learning from the success of the Energy Star program and standard in Texas with regard to marketing and communicating with service providers and consumers. Energy Star has significant market penetration in the state (31%) and, therefore, is likely both recognizable and desirable as a brand.
- Because the regulatory climate is likely to remain focused on voluntary initiatives, seeking those partners best able to convey the benefits of building green can directly address the issue of cost. This may mean collaborating on cost/benefit research studies, but may also mean advocating for more involvement and innovation within the financial community.

MIAMI/SOUTH FLORIDA

The Miami green homes market has yet to take off, a fact largely attributable to an uninformed consumer base and limited industry activity. However, the city has a strong champion in Mayor Manny Diaz. He has been extremely proactive in generating awareness of the need for a greener-built environment in the region and in promoting government and institutional support of green building initiatives. As such, recommended partnership and marketing strategies for Miami include:

- Leveraging the institutional momentum championed by the Mayor to spearhead major development projects. The Miami Green Commission should be able to provide valuable support and information.

- Collaborating with Whole Foods Markets in publicity associated with the four stores slated for development. Specifically targeting development in those areas where an existing or upcoming Whole Foods Market is in close proximity is also an effective strategy.
- Developing advertising and marketing schemes that portray and highlight the health benefits associated with green homes. Healthy living is a popular behavioral characteristic in the region, as signified by the strong demand for healthy foods and beverages.
- Partnering with the green building organizations in the area--The Florida Green Building Coalition, the Florida Solar Energy Center, and the USGBC chapter of South Florida--to drive consumer education and service-provider training initiatives. Whereas the Mayor and the government sector are helping spur concept awareness at a more broad level, there still remains the need for partnerships with a coalition of industry experts at the ground level to further educate and train interested consumers and tradespeople. This is particularly pressing because the consumers in the area generally do not possess desirable characteristics regarding receptivity to the green home message.
- Leveraging the knowledge capabilities of non-competitive markets, particularly in Sarasota County on the west coast, where activity in the green building space is more robust, to institute best practices that will be effective in improving proficiency in green building market science and increasing consumer awareness. WCI Communities has been active locally and may also provide valuable insight and information.
- Echoing the messages espoused by the Mayor and the general media in marketing materials and sales pitches. Furthermore, it will be important to find alternative ways to advertise than in mainstream magazines, because readership numbers are low in the region. Consider mainstream newspapers in which readership levels are higher.
- Highlighting the benefits of passive-cooling and a tight exterior envelope in relation to cost-savings. Because of the hot and humid climate and relatively high electricity rates, these messages will resonate well during a sales pitch.

NEWARK/NORTHERN NEW JERSEY

In the Newark and the greater northern New Jersey area, the green homes market has not yet made large inroads despite extensive activity within the government sector. There is relatively weak overall industry presence, with very limited demonstrated activity to date aside from the Energy Star program. However, there exists some indication that this sector is ripe to emerge. Multiple projects (Solaire, Tribeca Green, and the Octagon) in neighboring New York City have been built according to green standards, a fact that should have spill-

over effects for New Jersey in the form of skill development and concept awareness. Additional recommended partnership and marketing strategies include the following:

- Tailoring marketing efforts to attract the large number of high-value consumers already familiar with the tenets of green homes – but perhaps not able to afford ownership in Manhattan – to green developments in New Jersey.
- Focusing marketing efforts and promotions around universities and surrounding neighborhoods in an attempt to capture a number of the highly educated consumers in the area. Use the interactive census map to hone-in on specific areas with higher levels of educational attainment. Furthermore, the consumers in northern New Jersey appear prone to visit healthy food stores and Aveda stores and salons making appropriate venues for targeted marketing efforts.
- Advertising in main-stream press such as Newsweek, New York Times, and the Wall Street Journal.
- Leveraging the fact that energy efficiency, indoor air quality, and health concerns are large drivers of the New Jersey green homes market by developing appropriate marketing and sales strategies based on these themes.
- Establishing a symbiotic relationship with Energy Star to capitalize upon its successful penetration in the state. Because the USGBC has yet to make solid inroads into the area, Energy Star currently has a larger network of partners and affiliates.
- Approaching the chemical and manufacturing company BASF, one of the highest profile companies in the region who has already built a Near-Zero Energy home, with the idea of further increasing publicity and support for their products by incorporating them into other high-profile development projects.
- Using the New Jersey Green Home Office (GHO) for general advocacy, education, and technical assistance. The GHO is also currently developing the New Jersey High Performance Homes Plus program for market and production rate builders and will likely be searching for projects to help pilot the program.
- When addressing government organizations, couching language in terms related to smart growth since land-density and traffic congestion are two pressing state concerns.
- Including provisions for affordable housing within development efforts. This pressing need is also a major concern within city governments.

IX. CONCLUDING REMARKS

USE OF THE MARKET ENGAGEMENT FRAMEWORK (MEF)

Future Applications for Builders

The MEF developed here is designed to have a variety of uses for home builders. For a builder new to residential green building, an initial use is to apply the MEF to existing operating markets to analyze the strength of the green homes market and the particular motivations and demands of buyers, and then to plan for engagement. The MEF can be used to assess current product diversity and develop high-performance home options and packages tailored to the particular demands of the market. The MEF encourages builders to research the key acute pressures and issues receiving widespread public attention, and the benefits of green homes most easily sold in the particular market. The MEF can also be used to identify key avenues and strategies for marketing, in particular by identifying readership trends of likely green homebuyers for focused advertising. In the area of partnerships, the MEF can help a builder assess the strength of various industry and government programs and identify partnership opportunities for starting new initiatives and collaboration. The framework can also help identify associations and government programs that can facilitate entrance into the green homes market, as well as opportunities to partner with like-minded groups to promote the concept of green homes. In short, builders can use the MEF to develop effective plans for entrance into green home building in existing geographic markets.

The MEF also is useful in identifying new geographic markets for green home building. A green home builder can use the MEF to identify markets with latent demand ripe for entry, as well as markets already absorbing green homes. Understanding whether a market is relatively untapped or maturing is critical in designing the right product roll out, partnership strategies, and marketing campaigns to ensure maximum profitability. Lastly, the MEF can be used to craft strategies to enhance corporate-level differentiation. Sustainability is increasingly becoming a positive brand attribute, and the MEF can help a builder establish itself in this category.

Future Applications for a Regional Developer

A regional developer (those that work in limited geographic scopes, rather than on a national scale) can use the MEF for similar purposes as a builder as well as several others. Given the often larger scope of a regional developer, the MEF can assist in identifying partnership opportunities with city and state government programs as well as national level organizations, such as USGBC and NAHB. The MEF can also be used to identify areas in which to fund further residential green building research in a developer's region. For instance, a regional developer may want to do an in-depth study of the effectiveness of various local government and industry green home programs, and the MEF can help to

identify differences in the attributes of the consumer markets to take into account. The MEF is a powerful tool for a regional developer in discussing demand for green homes and strategies for engagement with builder partners, as it provides a concrete method for analyzing a market's potential and planning for engagement.

RECOMMENDATIONS FOR FUTURE RESEARCH

Clearly, it is an exciting time for the residential green building movement, as it rapidly moves from a niche market to a mainstream movement in many parts of the country. This project utilized the best available research from academia, practitioners, surveys, and expert interviews. For the residential green building movement, residential green builders, and developers to most effectively continue market penetration, additional research needs to be conducted in a variety of areas.

Focusing on consumers, more research needs to be conducted to increase understanding of the characteristics and motivations of the highest-value residential green building buyer--those with the highest willingness to pay and fastest absorption rate for green. As discussed in this report, this buyer exhibits many of the characteristics of LOHAS consumers, Cultural Creatives, True Blues, and Greenback Greens. More needs to be learned about the motivations, attitudes, and behavioral attributes of this highest-value market segment so they can be more easily identified and marketed to. There needs to be more research conducted into the drivers of green home buying by the more mainstream consumer, with a particular focus on regional differences. Residential green building is rapidly maturing in a variety of markets, including Denver, Austin, and the San Francisco Bay Area, and more needs to be learned about the forces and drivers behind this mainstreaming.

In addition to research on the consumer-demand aspects of the residential green building market, more attention needs to be paid to the techniques and practices of highly effective industry and government programs that promote green homes. Done correctly, these lessons learned could be invaluable in replicating similar programs throughout the country. From the builder side, the practices of highly effective companies, such as McStain Neighborhoods and WCI Communities, in engaging the three elements of a robust market need to be studied further to provide marketing strategies for newer entrants into the field.

Effective marketing techniques for green homes also need to be further researched. As discussed in this report, the marketing and sales of green homes is very different than that of conventional homes. The best practices and techniques reviewed in this report need further field testing and research to provide conclusive strategies for selling.

In the near term, specific research recommendations include conducting homebuyer surveys nationally and regionally to assess the proxies and indicators of residential green building demand proposed here. This project was limited to a few specific geographic areas, and more research is needed to refine the MML. In addition, pre- and post-occupancy

studies should be conducted of the green and conventional homebuyers to further understand the motivations and satisfactions of these purchases. A particular subtopic for research is the changes in buyer preferences and willingness to pay resulting from up and down markets. Both present opportunities for further green homes market penetration, but the most effective marketing techniques may differ.

APPENDICES

APPENDIX I: INTERVIEWEES

Note: Names in **bold text** were interviewed twice for additional feedback on the project’s findings.

Name	Affiliation	Industry Role
Amy Christopherson Bolten	Christopherson Homes	Builders/Developers/Architects
Barr Hall	McStain Neighborhoods	Builders/Developers/Architects
Dennis Allen	Allen Associates	Builders/Developers/Architects
Erich Volkert	LivingHomes	Builders/Developers/Architects
Henry Siegel	Siegel & Strain Architects	Builders/Developers/Architects
Karen Childress	WCI	Builders/Developers/Architects
Larry Strain	Siegel & Strain Architects	Builders/Developers/Architects
Maren Engelmohr	Mackey & Mitchell Architects	Builders/Developers/Architects
Peter Pfeiffer	Barley & Pfeiffer Architects	Builders/Developers/Architects
Mike O'Brien	City of Portland Office of Sustainable Development	Government Programs
Samuel Rashkin	US EPA - Energy Star Homes	Government Programs
Abbey Ehman	Contects -Consultants and Architects	LEED for Homes
Eric Martin	Florida Solar Energy Center/ University of Central Florida	LEED for Homes
Mary Westcot	Davis Energy Group, Inc.	LEED for Homes
Robert Wisniewski	MaGrann Associates	LEED for Homes
Bob Taber	Thomas Taber & Drazen	Marketing Experts
David Johnston	What's Working	Marketing Experts
Gordon Cooke	Air Solutions, Inc	Marketing Experts
Greg Stine	Polaris	Marketing Experts
Jerry Yudelson	Greenway Consulting Group, LLC	Marketing Experts
Marc Richmond	Practica	Marketing Experts
Molly Hoyt	Origo Inc. Consulting	Marketing Experts
Sara Lamia	Building Coach	Marketing Experts
Tom Paladino	Paladino and Co.	Marketing Experts
Brooke Warrick	American LIVES	National Real Estate Analysis
Greg Kats	Capital E	National Real Estate Analysis
Gwynne Rogers	Natural Marketing Institute	National Real Estate Analysis
Jerelyn Wilson	Building Green	National Real Estate Analysis
Lance Ramella	Hanley Wood Market Intelligence	National Real Estate Analysis
Michele Russo	McGraw-Hill Construction	National Real Estate Analysis
Annette Osso	Virginia Sustainable Building Network	Green Building Program Managers
Dennis Creech	Southface Energy Institute	Green Building Program Managers
Don Mull	California Green Builder	Green Building Program Managers
Katy Hollbacher	Build It Green	Green Building Program Managers
Richard MacMath	Austin Energy	Green Building Program Managers

APPENDIX II: RECOMMENDED LITERATURE REVIEW

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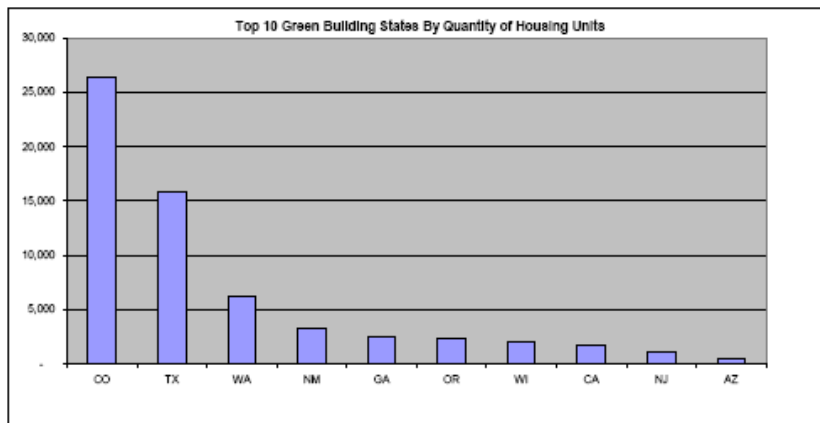
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SustainLane. www.sustainlane.us

Urban Land Institute. www.uli.org

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APPENDIX III: CERTIFIED GREEN HOMES BUILT 1990-2004, CUMULATIVE TOTALS



Source: National Association of Home Builders June 2005 data and author's calculations.

APPENDIX IV. RESIDENTIAL GREEN BUILDING PROGRAM STATISTICS

Residential Green Building Program Statistics*							
PROGRAM	CITY	STATE	TOTAL HOMES BUILT	2004 HOMES BUILT	2003 HOMES BUILT	2002 HOMES BUILT	2001 HOMES BUILT
New Mexico Building America Partner Program	Albuquerque	NM	3,227	727	0	0	2,500
Hawaii Built Green	Honolulu	HI	4	3	1	0	0
Colorado Built Green	Denver	CO	18,242	5,742	5,000	3,854	3,646
Built Green Kitsap	Bremerton	WA	445	67	47	53	278
Washington Built Green of SW	Vancouver	WA	47	11	10	26	0
Built Green Seattle	Bellevue	WA	5,652	1,652	1,800	1,200	1,000
Program of Kansas City	Kansas City	MO	18	6	9	3	N/A**
California Green Builder	Sacramento	CA	635	0	90	545	0
EarthCraft House(tm)	Atlanta	GA	2,430	400	1,230	300	500
Green Building Program	Austin	TX	4,545	753	602	715	2,475
Innovative Building Review Program	Santa Barbara	CA	993	26	18	16	933
Green Points Program	Boulder	CO	2,155	450	139	260	1,306
Green Building Program "GreenStar"	Frisco	TX	11,239	1,932	2,910	4,797	1,600
Building Incentive Program	Chula Vista	CA	0	N/A	N/A	N/A	N/A
Green Building Program	Scottsdale	AZ	460	239	38	54	129
WI Green Built Home	Madison	WI	1,981	792	637	350	202
Green Home Designation	Cocoa	FL	80	65	10	3	2
NC HealthyBuilt Homes	Raleigh	NC	49	37	12	N/A	N/A
VT Built Green	Burlington	VT	14	14	N/A	N/A	N/A
Earth Advantage(tm)	Portland	OR	2,527	1,113	916	498	0
Southern Arizona Green Building Alliance	Tucson	AZ	0	N/A	N/A	N/A	N/A
Green Home Choice	Arlington	VA	3	2	1	N/A	N/A
I-Built	Flagstaff	AZ	0	0	0	N/A	N/A
EcoBUILD	Memphis	TN	47	39	8	N/A	N/A
Tacoma-Pierce County Built Green(tm)	Tacoma	WA	0	0	0	N/A	N/A
NJ Green Affordable Green Program	Trenton	NJ	919	472	161	144	142
City of Aspen Efficient Building Program	Aspen	CO	47	47	N/A	N/A	N/A
Green Building in Alameda County	Alameda	CA	N/A	N/A	N/A	N/A	N/A
TOTALS			61,927	14,589	13,639	12,818	14,713
TOTALS				61,927	47,338	33,699	20,881***

*Provided by The NAHB Research Center
 **N/A indicates that either the green building program in question was not in existence at that time, or that records were not being kept on how many homes were built under that program for that particular year.
 ***There were 6168 homes recorded as being built according to a green building standard from 1990 through the end of 2001

Source: "An Analysis of Residential Green Building Best Management Practices", New Jersey Department of Community Affairs, 10. http://www.nj.gov/dca/06_gh_best_practices.pdf. Accessed March 20, 2007

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