SENIORS AND AMERICA'S HOMES:

Meeting Older Adults' Needs with Green Building Products & Practices

Final Report

Building Industry Roundtable
December 5, 2001 ◆ Ft. Myers, FL

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Table of Contents

Executive Summary

Older adults are one of the country's most influential and growing consumer groups today. Participants in the building industry roundtable held December 5, 2001 in Ft. Myers, Florida represented a wide range of backgrounds, bringing to the discussion expertise on older adults, green building, and marketing.

There are a number of issues to consider when trying to incorporate green building into the homes of older adults. The roundtable primarily focused on the following questions:

- What is relevant for older adults as consumers?
- What are the advantages and disadvantages of green building?
- How does the industry inform the consumer, deal with potential conflicts, and incorporate environmental considerations into the home building and land development process?

It was apparent throughout the roundtable that older adults are concerned with the increased cost associated with green building. In addition, the public at large tends to be skeptical about green building and it's benefits. Combating these perceptions requires committment and education by the builder, his employees and trade contractors, as well as the older adult consumer. NAHB's new Certified Aging-in-Place Specialist program is designed to help address this need for education.

Because the older adult consumer market is large and will continue to grow over the next 30 years, aging in place must be considered a viable solution to meeting the housing needs of this diverse group. Designed well, green housing solutions offer quantifiable value that empowers people to maximize their housing environment.

What are the next steps? Participants agreed that primary issues of concern are education, diversity of the population and economic situations, and cost. It was suggested that surveys be implemented to collect relevant information from seniors, contractors, builders and developers. Other ideas noted were

online education, builder/subcontractor hands-on training, and consumer educational sessions all devoted to older adult housing issues as they relate to green building. It would be important as well to get legislators and NAHB's legal department involved in the zoning and building code processes.

Report

Introduction

Older adults make up one of the country's most influential and growing consumer groups today. The older adult population has grown tremendously in the last decade and is expected to grow faster than any other age group in the coming 20 plus years. It is important to meet their housing needs, ensuring that they can live comfortably, while at the same time conserving natural resources. Green building is one of the possible solutions toward combining and meeting those goals; however, there are a myriad of issues to consider when trying to incorporate green building into the homes of older adults.

The NAHB Research Center and the U.S. Administration on Aging conducted a roundtable to discuss these issues and determine the best way to market green building to seniors. It focused on building in Florida, and participants came from a wide range of arenas. Represented were various senior support and health care organizations, marketers, university professionals, environmental specialists, architects, builders, and remodelers. They brought their expertise on the topics of seniors, green building, and marketing to the older adult consumer. This report contains the conclusions and recommendations of that roundtable.

Background

Both the number and proportion of older adults relative to the rest of the population are increasing. In 2000, approximately 35 million individuals were 65 or older in the United States. By 2030, this population is expected to double. At the same time, consumers, including seniors, have become more aware of resource conservation, energy efficiency, and other similar issues. These two phenomena have prompted consumers and environmental leaders to encourage building industry experts to explore ways to conserve resources as they meet the needs of America's growing older adult population. Green building is one solution, but the question is - will older adults buy into it? If they

do, what can the industry do to accelerate adoption of green building by older adults?

What is Green Building?

Green building can be defined as a collection of land-use, building design, and construction strategies and technologies that reduce the environmental impact of buildings throughout their life cycle. In addition to reduced energy and natural resource consumption, ecosystems are also protected, and occupant health is improved.

Regional differences affect building techniques, but in general, green building involves one or more of the following attributes:

- Land planning and design techniques that preserve the natural environment and minimize the disturbance of land;
- Site development that reduces erosion, minimizes paved surfaces and runoff, and protects vegetation, especially trees;
- Conservation of water indoors and outdoors;
- Energy efficiency in heating and cooling systems, appliances, lighting, and the building envelope;
- Design and selection of materials based on recyclability, durability, and the amount of energy used to create the material; and
- Reduction, reuse and recycling of waste during construction and throughout the life of the home.

In order to optimize a home's performance and to reduce costs as much as possible, green building concepts need to be woven into the project at the design phase. Such an approach enables the project leader to state the project's goals and mission to all trade contractors so that all of the disparate "green" parts can work well together.

Who are Older Adults?

The aging population is very diverse; in addition to different age categories, there are various socioeconomic levels, and regional differences among older adults that require distinct approaches to marketing concepts like green building. The diversity of this population reflects a great disparity in housing needs and wants. As the population of older adults increases, the need to find a solution to meet those housing needs intensifies.

The Issues

There are numerous issues surrounding the adoption of green building practices in residential building. This roundtable was designed to focus on those issues specific to the housing needs of older adults. Some of the primary issues of focus included:

- What is relevant for older adults as consumers?
- What are some of the advantages and disadvantages of incorporating green building into the homes of older adults?
- What techniques does the building industry use to inform the consumer that green building and housing needs of older adults can go hand in hand?
- How do we we deal with some of the issues where there may be conflicts?
- How do we incorporate environmental considerations into each aspect of home building and into the land development process?

Perceptions

After introductions, the group discussed how older adults generally perceive the concept of green building. Sue Maxwell, gerontology business leader at Lee Memorial Health System, introduced the topic of green building's affects on housing. She acknowledged that many older adults may not know what green building is, and for those that do, their perceptions vary by age group.

One of the major concerns that older adults may have is the increased cost associated with green building. Builders realize that the initial cost to build green may be slightly higher, and these costs are often transferred to the consumer. Many older adults are on fixed incomes and are unable or unwilling to spend money on home modifications for energy efficiency or to purchase a home that is energy efficient. Marketers of green building must get the message across that although the up-front cost may be higher, savings will be realized over a product's life-cycle through lower maintenance and an enhanced lifestyle.

Maxwell also made the point that older adults have often been targets for fraud, and it is sometimes hard to sell products to them because of skepticism toward new ideas. Green building is a fairly new concept; older consumers may not grasp the idea too well, particularly if increased cost is involved.

Convincing those who lived through World War II and the Great Depression to spend a little more to build green and help the environment may be difficult. Their focus is on accumulating wealth in order to leave an inheritance to their children. They may not feel that their investment in something like an energy-saving refrigerator will change the environment a great deal, but they can see the direct benefit their family will get from the $300 saved by not purchasing the refrigerator. Negative perceptions about green building that older adults might have come from a lack of knowledge of the subject, and many builders are not as well versed as they need to be in order to sell the idea effectively.

Pros and Cons of Incorporating Green Building

The Builder's View

After Sue Maxwell's presentation, the group broke into an open discussion to dig deeper into the topics raised. The group heard from Karen Childress, environmental stewardship manager at WCI Communities. Childress brought the builder's view to the discussion since WCI has already looked into addressing the needs of older adults in its green developments.

Childress confirmed that much of the resistance to green building is based on the associated added cost. While the concept of green building is clearly a good one, the immediate negative financial impact appears to outweigh the positive affects realized over the long term.

Employees and trade contractors must be educated and informed about the builder's commitment to green building and its positive impact on the environment. If this new focus can be clearly conveyed and training implemented, a successful green building program can be instituted that brings older consumers "on board". Green building is important to the individual and the environment, and both the worker and consumer need to acknowledge this.

Another obstacle to green building is the public's tendency to be skeptical about it. Although people in general may not be receptive to change, many are actually open to the concept and ready to hear about it. According to Childress, a builder who promotes green building creates a reputation of quality, environmentally-friendly construction, and healthy homes with the bottom line that it builds a better world. Changes in the building codes are also making a case for green building.

The Remodeler's View

Robert Black, president of Access of Sarasota, Inc., stated that remodelers should try to incorporate green building and energy-efficiency principles into all of their work. He indicated that according to the report on a study conducted by AARP, approximately 83% of people aged 45 and older want to stay in their existing homes. This creates a large market for the remodeler. While a large market is a clear pro, Black said the con is that there is a shortage of trained people to do the work. Education and training seems to be a dilemma across the board. He said the CAPS (Certified Aging in Place Specialists) program is designed to help educate the consumer and the builder/ remodeler, and will hopefully be effective in addressing the needs of this market.

The remodeler sells a service, and when this service is delivered, the client is usually satisfied because specific needs

are being met. However, sometimes situations change during the work in progress. Changing situations, particularly with the aging, can be drastic, and this can create significant problems. With new construction, the house can be re-sold, but in the remodeling market this is not possible.

Black specified three levels of the senior market: Boomers, "Mixers" (the senior market in the middle), and "Senior" seniors. The boomers are generally more educated, while the mixers consist of a variety of seniors, and the "senior" seniors are often resistant to change, according to Black. Although the view is generally unwarranted, some seniors feel that certain products are for "old people" and they are not ready to be perceived in that way. There are varying needs across this market for green products – for example, differences in the required lighting and windows – and since remodeling is very specific to the individual, this creates an extremely diverse market.

Similar to the builder market, affordability can be a problem in the remodeler market as well. Black recommended marketing some green products as novelty products since it is hard to show the payback to the customer. However, when trying to show the long-run benefit, he suggested letting the customer know that what they are receiving has a practical use. Education is the key to eliminating the cons from the remodeling side. Once remodelers are educated the specific needs of older adults and can easily convey that information to the client, then the older adult can weigh the pros and cons of moving forward with a green remodeling project.

The Advocate's View

The last of the three main topics highlighted at the roundtable came from a green building advocate, Patti Glenn, senior vice president of Green Smart Consulting. Glenn expressed the importance of effectively marketing green building to particular audiences. She recognized that the value of green must be translated to the consumer in the marketplace. Since there are not enough facilities to compensate the huge market that is to come, aging in place must be seriously considered. Today's consumer is motivated by value. Green housing solutions offer quantifiable value that empowers people to maximize their

housing environment. If the house a consumer buys today is designed well, it can suit their needs forever.

The solution for older adults is more affordability at every price point. Many seniors are concerned about leaving an inheritance to their children and don't want to spend the additional money to build green. A good closing technique is to counter the idea of wanting to leave something for the children. Show them how to turn energy savings into pre-paid college funds, or utility savings into annuities.

Green building offers tremendous cross-market appeal. Accessibility, comfort, health and safety, and empowering people in their homes are all messages that will appeal to the consumer. The market is value-oriented. If older adults are educated about the value they will receive, they will buy into it. Glenn said safety, lower maintenance, reduced risk of injury, durability, and increased security make older adults feel empowered in their own home. Show them that green building offers successful housing solutions that offer quantifiable value at every stage. Green building is the solution to the future, Glenn concluded.

In order to successfully inform older adults of green building's benefits, Glenn offered suggestions on what topics might ring true to this group of consumers. Below are those suggestions:

- Sustainability
- Energy efficient and cost effective
- Smart
- Resource efficient
- Aging in place – offer seniors access to services, security, high performance, cost effectiveness
- Affordability – long-term cost outweighs the initial investment, water conservation
- Health and safety – land use, material selection, security, improved indoor air quality, design, improved lighting resulting in reduced energy cost
- A green home is a healthy home and it enhances your livability in good and bad health
- Access, affordability, and security will sell green building to older adults – sell the *benefit* of the features

Summary of Pros and Cons

The morning segment of the roundtable focused on how green building concepts can effectively be incorporated into the housing needs of older adults. A builder, a remodeler, and an advocate each provided insight into the challenges inherent in integrating green building into existing practices and housing products.

After lunch, the group discussed some of the reasons why green building should be folded into older adult housing choices and what barriers might inhibit green building from catching on for this particular market sector. The benefits and the barriers mentioned by participants included:

- Benefits
    - Reduced life-cycle cost for buyer
    - Large growing market
    - Great communities
- Barriers
    - Lack of training and education
    - Labor shortage
    - Language barriers
    - Retaining help
    - Transitioning from component building process to a systematic team approach process

Next Steps

Many topics were discussed during the roundtable sessions, but the primary issues to consider are education, the diversity of the population, the diverse economic situations, and cost. So, what does the building industry need to do to integrate green building into the housing needs of the older adult? How do we team aging in place issues with green building issues? Some suggestions included:

- Create surveys on the Research Center's website for older adults, contractors, builders, and developers to convey their needs;
- Create links from major senior organization sites (i.e. AARP, AAHFA), National Safety Council, National Council on Aging, and builder related publications such as *Builder,*

Professional Builder, Custom Builder, Building Products, and Architectural Digest to get seniors' and building industry experts' responses to green building;
- Deliver education online;
- Forward questionnaires to seniors groups to get feedback;
- Have direct builder/subcontractor hands-on training to learn how to communicate with seniors;
- Get legislators involved in zoning and building codes;
- Get NAHB's legal department involved in the legislative/legal process; and
- Conduct educational sessions devoted to older adult housing issues as they relate to green building.

The topics discussed during this roundtable should be one of many ways to simultaneously market green building to older adults while addressing that group's particular housing needs. The ideas formed in Florida should serve as the foundation for other discussions elsewhere in the United States.

White Paper

Introduction

The 1973 Arab oil embargo triggered a new way of thinking for American consumers. Since this first major oil supply disruption caused significant price increases and a worldwide energy crisis, consumers have become more aware of energy conservation, energy efficiency, and other similar issues.

According to the *Wall Street Journal*, today over 75 percent of Americans consider themselves environmentalists.[1] In fact, David Johnston notes in *Building Green in a Black and White World* that environmental consumerism is one of the fastest-growing segments in the marketplace. He asserts that "buying green homes is a logical next step in this national trend."[2]

Findings of the National Association of Home Builders (NAHB) support this premise. NAHB has stated that green building has been the most significant development in the home building industry in the past three decades[3]. With the encouragement of both consumers and environmental advocates, builders, remodelers, product manufacturers, and other industry experts are voluntarily exploring ways to conserve resources as they meet the housing needs of America's rapidly expanding aging population.

The focus of this study is the nation's older adult (age 65 and older) population. According to the Federal Interagency Forum on Aging Relating Statistics, both the number and proportion of older adults relative to the rest of the population are increasing. In 2000, approximately 35 million individuals (nearly 13 percent of the population) were 65 or older in the United States. By 2030, this population is expected to double. The number of people 85-years old and older, in particular, is expected to grow faster than any other age group.

What is Green Building?

- *Land planning and design techniques*
- *Site development*
- *Conservation of water*
- *Energy efficiency*
- *Selection of materials*
- *Reduction of waste, and reuse and recycling*

[1] "Building Green in a Black and White World." Johnston, David. p. 6.
[2] Ibid., p. 1.
[3] "Building Greener, Building Better: The Quiet Revolution." NAHB Research Center and NAHB. April 2001. p.1.

Until now, builders, remodelers, product manufacturers, and other industry experts have not recognized older adults as a potential green building market. An NAHB survey, however, has found that older adults are not unlike the rest of the population when it comes to building green. That is, they are just as interested in conserving resources and improving energy efficiency as their children and grandchildren. Moreover, energy-efficient design and construction has made its way into the older adult housing market. And whether it is optimizing the amount of window area to make a home more energy efficient, or using floor coverings that improve indoor air quality, today's older adult homebuyer demands quality and value.[4]

The main question is — Will older adults — literally and figuratively — buy into green building? This paper will identify the key issues that must be addressed before this question can be answered. They include:

- The aspects of green building that are relevant for older adults;
- The advantages and disadvantages of incorporating green building practices into older adults' homes; and
- Techniques that the building industry can use to increase older consumers' awareness of green building and therefore accelerate its demand.

What is Green Building?

Broadly defined, green building is a collection of land-use, building design and construction strategies and technologies that reduces the environmental impact of buildings throughout their life cycle. In addition to reduced energy/natural resource consumption, benefits include the protection of ecosystems, and the improvement of occupant health.

Different regions of the country have their own climate-specific green building guidelines and checklists, but in general, green building involves one or more of the following attributes:

- Land planning and design techniques that preserve the natural environment and minimize the disturbance of land;

[4] Seniors' Housing News. "Seniors Want State-of-the-Art Quality." Stratton, Peter. Fall 2000, p.3.

What are the Key Issues?

- *Aspects of green building relevant for older adults*
- *Advantages and disadvantages of green building*
- *Techniques to increase older consumers' awareness*

- Site development that reduces erosion, minimizes paved surfaces and runoff, and protects vegetation, especially trees;
- Conservation of water indoors and outdoors;
- Energy efficiency in heating and cooling systems, appliances, lighting, and the building envelope;
- Selection of materials based on recyclability, durability, and the amount of energy used to create the material[5]; and
- Reduction of waste, and reuse and recycling during construction and throughout the life of the home.

Becoming a green builder is not only a way to generate profit in the short run, but it may secure the future of a company. As Santa Fe, New Mexico, builder Danny Buck relates, "Green building is where the market is headed. I'm 100 percent convinced of it. It's not a matter of if there is a market for green homes, but when are you going to meet it?…The question is, do you want to lead the market or follow your competition?"[6]

Who are Older Adults?

The number of older people in the U.S. has increased ten-fold since 1900. Over the next ten years, the number of households aged 65 and over will increase by approximately 3.2 million.[7] It is important to note that the oldest members of the baby boom population, those born between 1946 and 1964, turned 55 this year. Only ten years from being officially categorized as seniors, they are a group to watch. The baby boomers have earned or inherited more than any other group before it. If the stock market's fluctuations do not significantly reduce their retirement savings, the Baby Boomers are going to be more affluent than any other previous gray generation. Their huge numbers have continually influenced our society and undoubtedly will transform the way the home building industry considers seniors' housing.

Survey after survey shows that baby boomers' housing wants and needs do not fall into a neat category. Some want to stay in their own homes and remodel to enhance their lifestyle as they

What Will Maximize Older Adults' Interest in Green Building?

- *Energy-efficiency*
- *Low maintenance*
- *Enhanced safety and security*
- *Convenience and sense of community*
- *Addressing financial issues*

[5] *Building Greener, Building Better*. NAHB Publication. p. 1
[6] "Building Green in a Black and White World." Johnston, David. p. 7.
[7] Housing America's Seniors, p. 23

find themselves with more disposable income. Others desire to move to new homes that are specifically designed to help them to age in place.

Many factors will affect the housing choices of the aging population. Among those noted in the Joint Center for Housing Studies' *Housing America's Seniors* are: better health; greater longevity; increased wealth; and ongoing technological innovation. In addition, wider use of the Internet will enable seniors to educate themselves about housing options, making them more discriminating consumers[8].

The economic status of older adults has improved dramatically over the past few decades. Poverty rates have declined, and there has been a substantial increase in net worth for many older Americans. Between 1984 and 1999, the medium net worth of households headed by older persons increased by about 70 percent.[9]

While the current aging population enjoys certain socioeconomic advantages over its predecessors, the aging of America still presents specific challenges. Specifically, increased life expectancies present a new demand for the delivery of in-home services. Disparities in wealth among seniors will continue to limit the housing and care options that many will be able to pursue.

Older Adults and Their Homes

Following is a description of the current and future state of seniors' housing in America.

The majority of older Americans own their own homes and have no mortgage on them. Specifically, 80 percent of older Americans own their own homes, and about 77 percent of older homeowners in 1997 owned their homes free and clear.

The median value of older American's homes is slightly less than that of all homeowners. In 1997, the median value of homes owned by older persons was $89,294, compared to a

[8] Housing America's Seniors, p.3
[9] Ibid., p. 23

median home value of $98,815 for all homeowners[10]. The median family income of older homeowners was $20,280 – almost double the median family income of older renters, which was $10,867.

While older adults currently represent one of ten new homebuyers, a strong demand for both assisted and unassisted communities for older adults can be expected as their population expands more rapidly after 2010.[11]

Older adults tend to live in older homes. Many of the homes in which older adults live were built over 40 years ago, and require regular maintenance and repair. About 50 percent of homes owned by older persons in 1997 were built prior to 1960 (33 percent for younger owners) and six percent of these homes had physical problems. In 1997, 37 percent of older homeowners spent more than a quarter of their income on housing costs, compared with 30 percent of their income for homeowners under age 65.

What Aspects of Green Building are Relevant for Older Adults?

Designing, Building, and Remodeling for Energy-Efficiency

A building's ongoing energy use is its single greatest environmental impact. It is also an area of interest to older adults on fixed incomes, as energy costs represent a large percentage of their total expenses. Because they are more likely to live in older, poorly insulated homes, and because of their heightened risk of hypothermia, older persons tend to have higher heating costs. Specifically, elderly households overall spend 8.1 percent of their income on residential energy, compared to 5.3 percent for average households. Among low-income households, the proportion of income expended for energy consistently amounts to three to four times the proportion spent by most households.

[10] A Profile of Older Americans: 2000. Administration on Aging: U.S. Department of Health and Human Services.
[11] Housing America's Seniors, p. 9.

Builders, remodelers, and homeowners could incorporate the following to achieve greater energy efficiency in their homes:

- Air leakage checks and repair — In some areas of the country, as much as 30 to 40 percent of a home's energy load can be attributed to the leakage of outside air into the home. Air enters the home through gaps between framing materials and improperly installed insulation, by holes drilled for plumbing and wiring, and around doors and windows. Once a home is completed, a blower door test can evaluate how well the house is sealed. Common products, such as weather stripping, can be used to plug leaks from cracks and holes and can save the homeowner more than 10 percent on energy bills.
- Energy-efficient heating, ventilation, and air conditioning (HVAC) units — Nearly 50 percent of a typical home's utility bill goes toward heating and cooling. Installing the correctly-sized HVAC unit is key to obtaining better energy efficiency. Builders should look for furnaces with an Annual Fuel Utilization Efficiency (AFUE) rating of between 80 percent for conventional furnaces to 94 percent for energy efficiency or condensing furnaces, and a central air conditioning unit with a Seasonal Energy Efficiency Ratio (SEER) rating of at least 12. Builders should select a heat pump with a Heating Season Performance Factor (HSPF) greater than 7 and SEER rating of at least 12. Units with SEER ratings up to 18 are available.
- Duct systems – Builders can maximize duct systems' efficiency by locating them within a home's conditioned space, minimizing the length of duct runs, and ensuring that ducts are well-sealed so that they do not leak air. If ducts are routed in unconditioned areas, they should be insulated to reduce heat loss. In addition, once a home is built, duct blaster tests can determine the amount of leaks in the duct system.
- Better insulation — The appropriate amount of insulation for each climate should be used in the walls, roof assembly, and floors. Wall R-values typically range from R-11 to R-23, and the builder can increase the R-value even more by simply adding a layer of foam sheathing and using higher density insulation between the wall

studs. R-values for the floors generally range from R-11 to R-25 and in the ceiling from R-19 to R-50.

- High-performance windows — Buying and installing double-pane windows that have high performance glass (low-emittance coated, or "low-e" or solar control spectrally selective) windows and are filled with gas may help to downsize the heating and cooling equipment, since the energy efficient windows help to reduce heat loss in the winter and heat gain in the summer.
- Attention to indoor environment — As people age, the body's ability to handle toxins in the environment declines. Consequently, allergies to substances in the indoor and outdoor environment can develop. Materials with low toxicity, such as low volatile organic compound (VOC) paints, should be used to minimize exposure to potential allergens and irritants. Eliminating carpeting or using minimal carpeting is preferred, as carpet can be a source of allergens. Hardwood or laminate flooring is a good choice for those with asthma and allergies. Air filters, which reduce the amount of dust and other particles in the air, may also help to decrease allergens and asthma triggers in older adults' homes.
- Energy-efficient appliances and lighting — Manufacturers have made great strides over the past 15 years in improving the performance of refrigerators, dishwashers, and clothes washers and dryers. EnergyStar-rated appliances have been identified by the U.S. Environmental Protection Agency and Department of Energy as the most energy efficient in their classes, usually exceeding minimum federal standards by 30 percent or more. A new refrigerator with an EnergyStar label, for example, will save homeowners between $35 and $70 a year compared with the models designed 15 years ago.
- Light fixtures that are used more than two hours per day on average are good candidates for compact fluorescent bulbs. The energy savings will more than pay for the extra cost of the bulbs over their lifetime, and residents will have to replace fewer lamps because fluorescent lamps last ten times longer than incandescent light bulbs. Fluorescent bulbs use about 75 percent less energy and emit 90 percent less heat than incandescent bulbs.[12]

[12] *Fighting the Energy Battle at Home*. Copley News Service, R.J. Ignelzi, 9/10/01.

Installing motion sensors or timers on lights can also help to reduce the electricity bills. Solar-powered lights are also available to meet outdoor lighting needs by using free, renewable energy.

- Solar energy — Some areas of the country receive enough sunlight to heat their water and supply some of their electricity. Solar water heaters can meet homeowners' hot water demand, and provide hot water instantly. Solar water heaters are the most economical solar application available today, and typically pay for themselves in two to four years.[13] Photovoltaic systems are becoming a more attractive long-term investment for new homeowners as the average rates for utility-supplied power increase. In addition, solar power can heat outdoor pools.
- Programmable thermostats — These energy efficient items can be programmed to match the heating and cooling of residents' homes to their own schedules. The units typically offer savings of 10-15 percent without compromising comfort.
- Whole-house fans — When used at night with windows open, the fan pulls cool air into the house as it vents hot air out through the attic. This type of unit is placed in an upstairs ceiling, ideally in a central hall. The fans, which cost $300 to $600 installed, draw only as much power as a couple of light bulbs and are usually outfitted with a variable-speed switch and/or timer. For avid air-conditioner users, these fans can reduce the home cooling bill by up to 50 percent.[14]
- Ceiling fans — These fans use about the same amount of energy as a 100-watt light bulb. Ceiling fans should be operated only when the rooms are occupied; a motion sensor can help automate to optimize the use of the fan. Variable speed fans are preferable so that the lowest speed can be used in the heating season. Lastly, consumers can look for the Energy Star label on ceiling fans, as Energy Star-labeled models are designed to move air more efficiently than a typical ceiling fan.
- Water saving appliances, systems, and plumbing — The use of water saving appliances, systems, and plumbing fixtures reduces the amount of water used in homes, and

[13] *Fighting the Energy Battle at Home*. Copley News Service, R.J. Ignelzi, 9/10/01.
[14] *Ibid*.

the amount of energy needed to produce hot water. Horizontal axis washer-dryer combination units run automatically from wash to dry — eliminating the need to transfer clothes from one machine to the other. Their low-maintenance, energy and resource-efficient design saves both energy and water. Moreover, their compact size makes them perfect for apartment and condominium residents. Installing water conserving toilets, showerheads, and faucet aerators, designing landscapes to absorb rainwater runoff, and collecting rainwater for use in landscape irrigation can also reduce water and energy costs.

- Strategically-placed landscaping — Properly placed trees and shrubs will reduce utility bills. Planting deciduous trees on the west and east sides of the home will help shade homes and reduce cooling loads in the summer while allowing winter sunlight through to help warm the house. Hedge rows and shrubbery can block cold winter winds or help channel cool summer breezes into buildings.[15]

Creating Communities to Reduce Dependence on Automobiles and to Foster a Sense of Community

Effective land use planning and design can encourage the development of strong communities. Older adults report that they want to be part of a vibrant community and be involved with their neighbors. This sense of community reduces their feelings of isolation and increases their perception of safety.[16] In addition, many older adults either do not feel comfortable driving or have insufficient visual ability to drive. So that they are able to stay where they live, shopping, restaurants, and medical services must be accessible via public transportation or short walk. Builders and remodelers can do the following to achieve this end:

- Siting of buildings — Builders can site homes in a way that enhances the public space around them and maximizes pedestrian access.
- Clustering of homes – Clustering homes facilitates neighbor interaction.

[15] *Environmental Building News*. "Checklist for Environmentally Responsible Design and Construction." p. 2
[16] NAHB Research Center Focus Groups, 10/01.

- Public access — Communities can provide access (i.e., within one quarter mile of the home) to public transit, pedestrian corridors, and bicycle paths so that travel to work and recreational opportunities is convenient for residents.
- Encouraging mixed-use zoning – Mixed-use developments provide homeowners with easy access to shopping, restaurants, and other activities.[17]

Protect and Enhance the Site by Preserving or Restoring Local Ecosystems and Biodiversity

- Protecting trees and native vegetation during construction — Many older adults report that they find open spaces and greenery in their neighborhoods attractive and comforting.[18] Moreover, through low-maintenance xeriscaping, which uses native, drought-resistant plants for landscaping, outdoor water can be reduced by 30-80 percent.
- Clustering of homes — Clustering homes can create open space areas, and preserve trees, wetlands, meadows and other natural amenities.
- Improving water quality — Builders can plant certain kinds of vegetation near streams that remove pollutants and sediment while providing habitat for birds and wildlife.

What Aspects of Green Building are Relevant for Remodeling to Age-in-Place?

The majority of older adults wish to remain in their own homes as they age for as long as possible. To this end, remodelers can incorporate the following green building features to assist older clients in increasing energy efficiency and improving indoor air quality.

- Energy retrofitting – Remodelers can recommend retrofitting homes with energy efficient appliances, lighting, and insulation to reduce energy costs and increase occupant comfort. For example, remodelers

[17] *Environmental Building News*, Vol. 4, No. 5, September/October 1995.
[18] NAHB Research Center Focus Groups. 10/01.

can: replace traditional tank water heaters with solar tankless water heaters to decrease energy costs and increase storage space; replace refrigerators with high-efficiency, EnergyStar refrigerators; replace traditional clothes washer/dryers with high-efficiency and low maintenance horizontal axis washer/dryers; add whole house and/or ceiling fans; replace current plumbing fixtures with water-conserving showerheads and toilets; add programmable thermostats; seal any air leakage points; and replace traditional bulbs with fluorescent bulbs; and trade older windows for energy-efficient, low-e windows.

- Improving indoor air quality – To minimize the presence of allergens, asthma triggers, and other physical irritants in the home, remodelers can use low VOC paints and compounds, minimize the use of carpeting, and install high quality air filters.

Advantages and Disadvantages of Incorporating Green Building Practices into Older Adults' Homes

Following are advantages of incorporating green building practices into older adults' homes:

- Tax incentives for green building are available. For example, in Maryland, developers of green buildings could receive tax benefits for their energy efficiency efforts under legislation passed in April 2001 by the Maryland State Senate. The bill offers tax credits to encourage developers who incorporate conservation features in new and rehabilitated buildings.[19] New York State's Green Building Tax Credit, which applies only to buildings over 20,000 square feet, was signed into law in May 2001. It is designed to encourage building owners and tenants to produce energy-conserving and environmentally friendly buildings and spaces by offsetting some of the additional first cost associated with high performance buildings. Under this program, $25 million is available from 2001-2009 to building owners and tenants in the form of income and franchise tax credits.[20]

[19]GreenClips. 9/13/01.
[20]Ibid. 9/10/01.

- The EnergyStar Program was introduced by the U.S. Environmental Protection Agency (EPA) in 1992. It began as a voluntary labeling program to identify and promote energy-efficient products to reduce carbon dioxide emissions. In 1996, EPA partnered with the U.S. Department of Energy to promote the EnergyStar label, with each agency taking responsibility for particular product categories. EnergyStar homes and products are at least 30 percent more energy efficient than the national Model Energy Code. EnergyStar covers new homes, most of the buildings sector, residential heating and cooling equipment, major appliances, office equipment, lighting, and consumer electronics.
- Financing unconventional homes is getting easier. For example, numerous local lenders offer energy-efficient mortgages (EEMs) nationwide. They are nationally underwritten by Fannie Mae, Freddie Mac, and the Federal Housing Administration (FHA). These mortgages enable homebuyers to qualify for a larger mortgage by allowing a higher debt-to-income ratio than allowed by conventional loans. With an EEM, if homebuyers increase the cost of the home by incorporating energy efficient features, their down payment will stay as if these energy efficient features were not added to the home. Therefore, consumers have an incentive to add these features. EEMs allow the significant monthly energy savings realized to be put toward the higher monthly mortgage payment.

The lending industry has developed energy improvement mortgages to give the buyers of existing homes the opportunity to borrow more money at the time of sale or refinancing to make their homes energy-efficient. Existing homeowners can use EEMs to upgrade their homes so that they qualify as energy-efficient. Homeowners can add the cost of these upgrades to the mortgage, and then profit from the tax benefits and long-term interest rates.

Fannie Mae recently initiated a green mortgage program for new homes in several cities, including Los Angeles, Denver, Atlanta, Albuquerque, Seattle and Columbus, Ohio. In this

program, if the builder meets green building requirements, the buyer becomes eligible for a larger mortgage.[21]

However, financing problems persist because:

- Many older adults report that they do not want to use a financing instrument to purchase their home, and that they would rather pay cash to have the ability to make other investments[22] ;
- Some appraisers believe that alternative buildings are inferior or simply refuse to appraise them appropriately;
- It may be hard to find homes of comparable size and construction type in the same area on which to base the appraisal (Though a few mortgage companies, including GMAC and Countrywide, are loosening their comparables standards for eco-homes); and
- Once approval for an alternative home is granted, a larger down payment may be required than for a traditional home.

Limitations for building green include:

- First-costs are usually higher for many green building products and practices, which may cause some hesitancy for older adults on fixed incomes. While green building can be done with a minimal increase in the home's price, it often increases the home's price tag 3-15 percent. However, many of the higher first-cost products and strategies significantly reduce life-cycle costs — the dollar valuation of investment, installation, operation, maintenance, repair, replacement, and energy costs over time. For example, though a high-efficiency refrigerator may cost between $70-$250 more than a standard-efficiency refrigerator, the refrigerator can save a homeowner $100 in average annual energy costs. Therefore, in approximately two years, consumers could achieve payback for this appliance. Low-cost green design and construction practices do exist for both residential and commercial applications.
- Educating and persuading older adults on the value of life-cycle costs is more time consuming than marketing

[21]Jan Sheehan. "Natural Home." July-Aug 00, p. 36 in GreenClips. 9/13/01.
[22]NAHB Economics Division. *What 21st Century Homebuyers Want*. 6/01.

and building with conventional building materials and practices.
- As green building practices are not widely used throughout the country, there is a contractor learning curve that must be overcome.
- Currently, there is a lack of uniform guidelines for green building.[23]

Will Older Adults Pay for Green Building?

It is unclear whether older adults will pay for green building features. However, NAHB's Consumer Preferences Survey found that the top four community amenities preferred by households headed by individuals 65 years of age and older are: park area (56 percent), walking/jogging trails (53 percent), public transportation (49 percent) and open spaces (46 percent.)[24] When NAHB asked homebuyers how concerned they were about the impact of building their home on the environment, 10 percent said they were not concerned. 26 percent said they were concerned, but did not consider it in a home purchase, and 50 percent said they wanted an environmentally friendly home, but would not pay more. Only 14 percent said they would pay more for an "environmentally friendly" home. According to Paul Emrath, a senior economist at NAHB, these figures varied little regardless of the respondent's age.

Marketing Green Building to Older Adults

The older adult population, as described earlier, is very diverse. Moreover, the influential and relatively affluent baby boomers will soon become older adults, altering the seniors' housing equation completely. Following are marketing strategies specific to the older adult population and green building:

- Become active in the community and cultivate long-term client relations — older adults commonly rely on referrals from friends and neighbors when choosing contractors or builders.

[23] *Los Angeles Times*. "Blue Print for Green Homes: Building with Recycled Materials and Energy-Saving Designation on the Rise." p. K1, 10/14/01.
[24] NAHB Economics Division. *What 21st Century Homebuyers Want*. 6/01.

- Obtain visibility and recognition for green building efforts by hosting public events on-site, or by writing a feature for the local media.
- Train sales teams to highlight the financial and environmental benefits of the green building products and systems that your company offers in a clear and courteous manner.
- Use easy to read type and font size in publications, which should be printed on non-glare paper.
- Build collaboration with older adult clients, and show interest in their current and desired lifestyles.

Older adults most commonly look for homes that are energy-efficient (to reduce operating costs) and low maintenance, enhance their safety and security, and offer convenience and a sense of community. Accordingly, focusing green building marketing efforts around these issues is most effective. Moreover, since financial conditions within the older adult population may limit their housing options, it is vital that builders and remodelers educate these consumers on how to address these issues. Following is a review of the green building products and practices that can be used to maximize older adults' interest in green building.

Energy-efficiency

Older adults frequently replace their HVAC systems to achieve greater energy efficiency. Focusing on how EnergyStar Program homes and appliances can save them money in the short and long run would be of great interest. Builders and remodelers should stress the usefulness of better insulation, programmable thermostats, whole house and ceiling fans, fluorescent lighting, solar hot water heaters and outdoor lighting, and water saving appliances and systems. Older adults interested in open, green spaces can take advantage of strategically placed landscaping to address heating and cooling loads.

Low maintenance

Green building can contribute to low maintenance homes through the use of xeriscaping, durable composite building products, hardwood or laminate flooring, solar-powered outdoor lights, motion sensors or timers for lights, fluorescent bulbs, timed lights, and programmable thermostats.

Enhancing safety and security

Older adults are interested in indoor air quality and personal safety. Materials with low volatile organic compounds, and high-quality air filters would help to address this issue.

Convenience and sense of community

As people age, some will experience visual or other physical impairments that will affect their ability to drive or to walk a considerable distance. Moreover, many older adults often enjoy being close friends with neighbors and participating in community activities. Therefore, locating clusters of homes in proximity to such recreational activities as bicycle paths, shopping, restaurants, medical facilities, and public transportation is a beneficial green building practice for this group.

Addressing financial issues

To address the financing issues that many older adults will face whether they buy new homes or are renovating so that they may age in place, builders and remodelers have numerous options:

- Look for state tax benefits for green building initiatives to lower costs.
- Become well-versed on programs that facilitate the buyer's financial and/or other rewards for purchasing environmentally friendly products and services.
- Understand and promote energy-efficient and energy improvement mortgages and have lending industry contacts on hand for referring interested and/or potential clients.

Real Life Examples

The following examples describe how green building materials and practices can be used to keep the aging population safe, independent, and comfortable in their homes.

- ARCOM, which manages and develops retirement communities nationwide, has a community located in Chicago with the largest indoor organic rainforest in the country. It is covered in glass, and senior apartment units open up into the forest.

- Pulte Home Corporation recently won a 2001 Energy Value Housing Gold Award for building a 1,066 square foot home, geared for the aging population, in Chandler, Arizona. The home offers guaranteed energy bills in conjunction with Louisiana Pacific's Engineered for Life Program, which provides backing for the energy cost guarantee. The home features tinted, low-E windows, cellulose insulation and foam sheathing, and ductwork sealed with mastic for a leakage below three percent of the floor area.
- In July 2001, WCI Communities, Inc. of Bonita Springs, Florida and Audubon International, a not-for-profit environmental organization in Albany, New York, created a $1.4 million agreement whereby WCI will apply Audubon's Principles for Resource Management in the design, planning, and construction of 10 future communities the company is planning in Florida. WCI is a home builder that primarily serves move-up, empty nesters, and retirement homebuyers, building luxury homes ranging from $400,000 to nearly $10 million. "The agreement will guide planning and development decisions relating to natural resource conservation and protection, water quality and water conservation, habitat protection and energy conservation. In addition, the agreement calls for the training of WCI employees, creation of community education programs, and compliance monitoring at all certified WCI communities." WCI has also donated $350,000 to help create Florida Gulf Coast University's Green Building Learning and Demonstration Center, which will develop and test green building materials and practices for application in the consumer marketplace.[25]
- Solavita, a gated, active adult community in Poinciana, Florida, comprises 1,200 acres of woodlands. It features pedestrian walkways, scenic waterways, small neighborhoods, and a village center. Seventy percent of the community's area is comprised of parks, lakes, golf, and conservation areas. As part of its stormwater management system, 29 manmade lakes have been added to help filter water runoff and preserve the natural wetlands systems.[26]

[25]WCI Communities Press Release. 9/26/01.
[26]Florida Association of Realtors Press Release. 8/21/01.

- Since the early 1970's, the Homemakers of Strafford County, New Hampshire have served as a home health and adult medical day care organization serving the elderly by offering cost-effective visiting nurses, home health, and adult medical day care services. The group focuses on preventing or postponing unnecessary hospitalization or nursing home placement for the aging population. It now plans to build single family, townhouse, and duplex units, a recreational facility, medical building, child care center, and a village center with several shops in one convenient area so that elderly residents can maintain their independence while obtaining necessary medical services. Community plans focus on preserving open space and natural resources.
- In Blenheim, New Zealand, a 32-unit senior development was built to provide affordable rental accommodations. The development features low-maintenance clusters of residential units with solar hot water systems. The clusters have been oriented for sun exposure to increase energy efficiency and keep residents comfortable.

Conclusion

As energy prices fluctuate and gain more attention in the mainstream media, customers are increasingly demanding environmentally friendly, energy-efficient homes. This may be even more prevalent among older adults on fixed incomes. Tony Allen, vice president of sales and marketing for Pulte Homes in Tucson reported that "consumers are the ones driving green housing in the building industry."[27]

Author David Johnston reports that "building green is all about meeting your buyers' desires with a product that reflects what they want out of life: health, comfort, and time to just simply relax...Green building meets these desired needs by reducing the amount of health compromising chemicals used in a home, by improving energy efficiency and thus reducing electric bills, and by offering a practical way for people to contribute to preserving the quality of the environment through reduced resource consumption."[28] Older adults are looking for ways to

[27] *Realtor Magazine*. "Frontlines: Savings Create Demand. Green housing: it's no illusion. Sedan, Paul. 5/1/01.
[28] "Building Green in a Black and White World." Johnston, David. pp. 6-7.

make a difference in their communities, interact with their neighbors and with nature, and stay comfortable, safe, and independent in their homes. In very real, measurable, and marketable ways, green building embodies these goals.

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