

WHAT'S NEW IN ECO-AFFORDABLE HOUSING?  
*COMBINING GREEN BUILDING INNOVATIONS WITH  
AFFORDABLE HOUSING NEEDS*

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## **What's New in Eco-Affordable Housing?**

### *Combining green building innovations with affordable housing needs*

#### **Introduction**

In recent years, interest and activities related to green building have been on the rise. As builders, architects, and code developers shift toward energy-efficiency and greater use of responsible materials in housing, the benefits of these shifts are also influencing affordable housing. Green building and affordable housing priorities intersect strongly around desires to reduce operating costs for building occupants, and they can also create synergies for supporting local needs and values, utilizing responsible materials, and designing self-sustaining sites with minimal environmental impacts.

The idea of combining green building innovations with affordable housing needs is new in some ways but the general overlap of interests is well established. Certainly, green building certification programs and formalized standards for green building are a recent development, but efforts to design efficient and affordable housing are not. As both conversations have developed over time, the opportunity to combine efforts has increased and crystallized.

This report provides an overview of the concept of “eco-affordable housing” and identifies significant opportunities for adoption of green building innovations within the affordable housing sector. Several examples are included to illustrate the intersection between green and affordable within and outside North America, including China, where housing is a major challenge. As the interest in green building and the need for affordable housing continue to grow both domestically and internationally, building bridges between the two areas is likely to increase the impact of both.

#### **What is Eco-affordable Housing?**

The term eco-affordable housing is used to describe programs and projects that integrate green building concepts with efforts to provide housing that is affordable to a target market or community.

Eco-affordable housing components:

- Ecologically responsible: As defined by the community, green building guidelines, or other ecological principles.
- Affordable: As defined by a specific area, considering community needs or other economic indicators for a target market.

It is important to recognize that eco-affordable is “not just about the house.” An eco-affordable housing project can serve as a way to increase community involvement in defining housing needs and identifying local environmental priorities, and can even create opportunities for economic development and local self reliance as people develop new skills related to green building practices.

There is significant variability in eco-affordable housing efforts due to both the relative newness of the formal concept and the need to be flexible in addressing diverse green building goals and specific community housing needs. This variability can create confusion and even conflict over competing definitions of what constitutes an affordable green building program. However, the various approaches also offer a range of models for communities and organizations to learn from as they initiate their own eco-affordable housing project.

### **Intersecting Green Building and Affordable Housing**

There are several key ways that green building interests and affordable housing needs overlap. The intersection between the two includes shared interests in energy-efficiency, reduced house size and associated needs for maintenance, prefabricated construction techniques, the use of responsible materials, and self-sustaining sites.

#### *Energy-Efficiency*

In a 2007 survey, sixty-three percent of “green” homebuyers said they were motivated to buy their homes by the lower operating and maintenance costs due to improved energy- and resource-efficiency.

By incorporating energy-efficient appliances, high-efficiency heating and cooling systems, well-insulated windows and doors, and other energy saving practices, homeowners can substantially reduce their energy use without necessarily increasing construction costs. Homes built in “Prairie Crossing”, a conservation development in Grayslake, Illinois, reportedly need 50% less energy to operate than a traditional home in the area, and yet cost the same to build. Despite the many opportunities for increased home energy-efficiency, since 1970, total household energy use has risen, even as energy use per square foot has declined (Figure 1). This trend leads to the next topic of reduced home size as a tool to increase affordability and reduce environmental impacts.

#### **“Green” does not necessarily translate to environmental concern on the part of the homeowner**

“Home buyers may not necessarily understand or care about “sustainability,” or “green” homes, says Knott, but they do appreciate long-term durability, a healthier living environment, and reduced energy costs. (The EPA says the average American family spends \$1,291 a year on home energy; the NAHB says it’s more like \$1,600.)

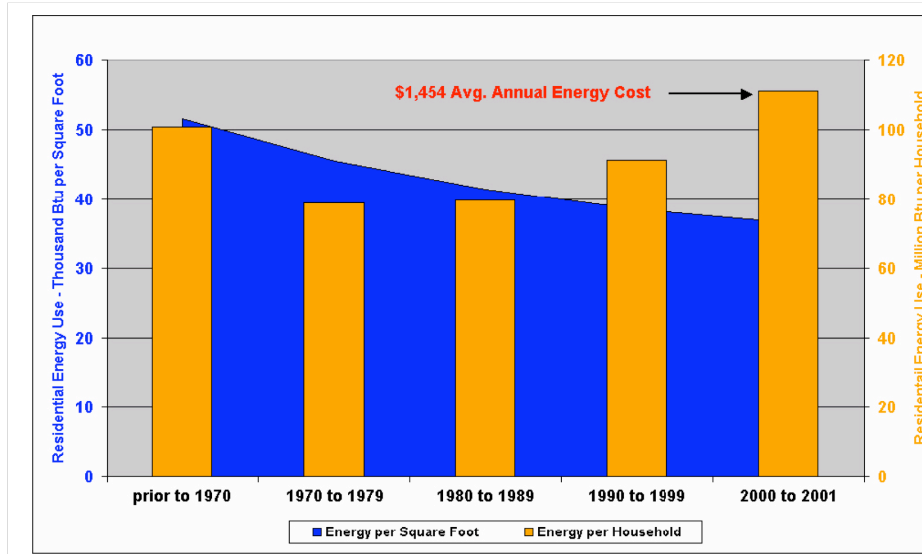
In fact, consumer demand is viewed as the most important reason (55%) why the residential market is getting so much greener. Of those surveyed builders who are working on green homes, 88% said they are being pushed to do so by consumers seeking out more efficient, healthier homes. Builders in the survey cited energy efficiency (82%) and indoor air quality (66%) as the two areas home seekers value most.

To maximize profit from green homes, builders need to consider upgrading insulation, HVAC systems, windows, and doors in their projects (and also specify energy-efficient, Energy Star appliances).

One note of caution: Buyer preference for different green elements varies based on geographic differences. The best tactic seems to be to offer a basic, appealing, well-constructed home (homes perceived as weird or too complex will repel buyers) and allow buyers to add green options as their interests and budgets allow.”

*Building Design and Construction White Paper 2006.*  
[www.bdcnetwork.com/contents/pdfs/whitepaper06.pdf](http://www.bdcnetwork.com/contents/pdfs/whitepaper06.pdf)

Figure 1. Energy Costs by Year of Construction



Source: NAHB

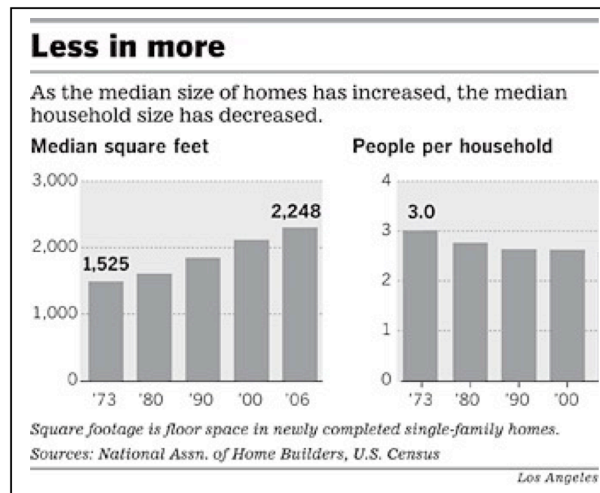
*Reduced House Size*

A basic concept of both green building and affordable housing is creation of homes of manageable size. For green building supporters, a primary way to reduce environmental impact is to reduce the overall size of the project, the materials required for construction, and the energy needed to operate and maintain the building. Similarly, a primary way to reduce the expense of a home is also to reduce the overall size.

Since the 1950s, the average size of an American home has more than doubled, to 2,248 square feet in 2006, despite a decline in the number of people per household over the same period (Figure 2). In large part this translates fairly directly to similar increases in the quantity and cost of materials used in construction and the energy used in operation. Typical affordable housing projects are less than 1,500 square feet for a single family home, and some green building programs penalize 2-bedroom homes that are larger than 1,430 square feet.

One of the leading concerns raised in response to efforts to reduce home size is that smaller homes will be crowded or poorly designed to accommodate modern needs and interests. To make small homes highly functional and enjoyable places to live, several approaches may be used.

Figure 2.



In Japan, where the average home size is still less than 1,500 square feet, common practices include the use of moveable walls and room dividers in an open floor plan, built-in storage and cabinets, small and stackable appliances, and instantaneous water heaters. In the United States many of these same techniques could be more widely adopted to economize the use of space and are being used in some apartment, condo and loft developments.

Several examples illustrate incentives for reducing the impact of large homes and the design of innovative and affordable small homes.

#### Boulder County, Colorado

To reduce home energy use and construction impacted land, Boulder County, Colorado has been considering setting limits for the size of new homes. The average new home size in the area is 6,290 square feet. One proposal would restrict new homes to 4,000 sq.ft. in the plains region and 2,600 sq. ft. in the mountain foothills. Builders could forgo this restriction by investing in land preservation, and would be required to purchase the same sized lot of land for preservation as the site they are developing.

#### LEED for Homes Program

The LEED for Homes (pilot) program has recognized that smaller house size is an important facet of reduced environmental impact. The program's "Home Size Adjuster" works by rewarding smaller homes and penalizing the larger ones through its points system. For example, a 1,950 sq. ft, 3 bedroom home is considered "neutral" while a 1,490 sq. ft, 3 bedroom home receives a threshold adjustment of -5. This adjustment means that the minimum threshold for this smaller home to be recognized as a "Certified" LEED Home is five points less (40 points rather than the 45 points) than that required for an average "neutral" home. A 3 bedroom home of 2,550 sq. ft. receives an adjustment score of +5, meaning an additional 5 points must be achieved to receive recognition from the program.

#### Sustain miniHome

The Province of Ontario, Canada is home to the manufacturer of the Sustain miniHome, which is designed to consume no more than 1.5Kwh of electricity each day<sup>1</sup>. The miniHome is less than 300 square feet (an 8' x 12' addition is available) and uses both solar panels and wind turbines to produce energy. It is constructed using FSC-certified wood and does not use materials containing formaldehyde, VOC's, or vinyl. The miniHome costs \$107,000-\$167,000 USD, which translates into about \$450/sq. ft.

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<sup>1</sup> Average use for an American household is approximately 10,656Kwh per year or approximately 30Kwh per day (2001 data). Source: EIA. Additional information available at: <http://www.eia.doe.gov/emeu/recs/recs2001/enduse2001/enduse2001.html>

### The LV Home Series

The LV Home Series by Rocio Romero is a 1,150 sq. ft., two bedroom, two bath affordable prefabricated home. Named for Laguna Verde, Chile, where the designer developed the concept, the basic kit (wall panels, structure, and cladding) costs about \$32,900, and although it does not include windows, roof, foundation, and interior finishes, it averages around \$87/sq.ft. when these features are incorporated in the completely finished product. Specifications for finishing the home are included and offer opportunities to incorporate additional green building considerations in the materials and finishes.



*LV Home Series, Rocio Romero*

### The weeHouse

The steel and wood-frame prefabricated weeHouse is approximately 800 square feet and costs around \$125/sq.ft. Multiple units can be stacked to add more space. The homes are well insulated, include Ikea cabinetry, hardwood floors, and an open floor plan. The company is based in St. Paul, Minnesota and the homes are designed by Alchemy Architects. The company has plans to add more green features over time.



*weeHouse Interior, Alchemy Architects*

### *Prefabricated and Modular Homes*

Prefabricated and “modular homes” have been praised for their efficient material use and lower production costs, which make them prime candidates for the eco-affordable housing movement.

In the past, mention of prefabricated or modular homes could raise concerns about quality and design creativity for many Americans. However, as the manufacture and development of prefabricated and modular homes has become more common, these concerns have been creatively and effectively addressed. Today, the term “prefabricated” is no longer associated with only mobile or small and affordable homes. Prefabricated components are generally a component of all homes.

Modular and panelized housing is common outside of the United States, and acceptance is also growing domestically. Architects have found that manufactured housing can offer higher quality than a site-built home with the benefits of using specialized labor, faster and more precise automated equipment, and indoor manufacturing conditions. According to a study done by the University of Florida, prefabricated homes are more energy efficient due, in part, to the construction methods required so that modules are not damaged during transport to the site. The factory-built approach to home construction has

been widely used in Scandinavian countries for many years with demonstrated benefit. For example, the Swedish government resolved in the 1940's to turn a housing shortage into a highly professional construction industry that produced high-quality affordable homes. During the energy crisis of the 1970's, Sweden used this highly-effective model to improve energy efficiency as well. Today ninety percent of Sweden's housing is prefabricated, and most Swedes associate energy-efficiency and durability as a must with prefabricated construction. There are opportunities for the domestic prefabricated homes sector to examine the Scandinavian example and explore methods of making housing construction a high-quality and "green" commodity. Some examples from Sweden, Japan and Minnesota help show the innovation that is possible.

### BoKlok

Literally translating into "Live Smart," the Swedish company has been constructing these affordable prefabricated structures since 1997. The timber-frame one and two bedroom homes are currently available in Denmark, Norway, Finland and Sweden, and in 2006 also became available to low-income families in the UK through Ikea. Ikea works on this project in conjunction with the Hyde Group housing association, Paramount Homes and Skanska.

### SUS

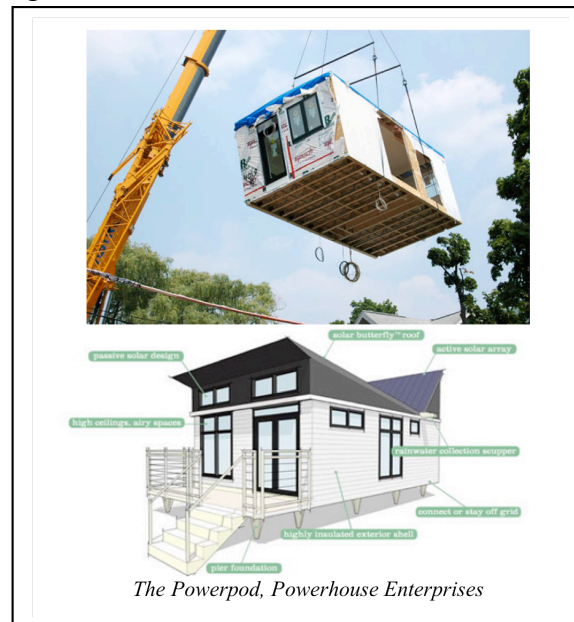
SUS, a Japanese manufacturer of automated factory equipment, has developed aluminum framing structures that can attach to existing homes or be used in new home construction. The *tsubomi* provide 952 square feet of space, can be assembled in a day and cost \$17,000.

### Hive Modular Building

Hive Modular Building, based out of Minneapolis, Minnesota, has four different house designs of various shapes that can also be customized. Typical construction costs are \$140-\$200 per square foot, and vary depending on site conditions and location. Hive is incorporating green building considerations, including use of FSC-certified materials and obtaining LEED certification. The company is pursuing LEED certification for their line of modular homes.

### Powerhouse Enterprises

Self-described as "healthy-hip-affordable" homes, Powerhouse Enterprises offers prefab homes in a variety of sizes, from the conventional single-family or multifamily side-stacked homes, to the PowerPod, which arrives on a flatbed truck and is assembled in one day. This company, based out of Lawrence, Massachusetts designed each home with



moving roof parts that can fit under bridges (a design challenge with transporting other prefabricated homes). All homes can be completed with radiant-heated floors, solar power, and responsible materials, and are advertised as being affordable.

### *Responsible Materials*

A common theme in green building programs is the concept of “responsible materials<sup>2</sup>”. In green building, materials are usually chosen based on their level of environmental impact while in affordable housing, materials are typically chosen based solely on cost. For many green building programs, criteria regarding materials emphasize the use of recycled, rapidly renewable, third-party certified, and locally harvested or manufactured products. However, there is no consensus around this list of criteria being the appropriate definition of responsible materials, and quite possibly the list should be dramatically different for different projects and regions and in respect to affordable housing considerations.

For green building advocates and affordable housing project developers who are interested in the concept of responsible materials and in need of a consistent and valid approach to material selection, there are three primary approaches to consider:

- *Use Life Cycle Assessment.* One of the most robust methods for comparing alternative materials is through the use of Life Cycle Assessment (LCA) which accounts for the environmental impacts throughout the life of a material and quantifies emissions to air, water, and ground associated with manufacture and transport as well as other measurable impacts<sup>3</sup>. With LCA as a common basis of evaluation and comparison, recycled materials that require large quantities of water or energy to produce do not compare well with alternatives that do not, nor do rapidly-renewable materials that are transported from distant suppliers. Currently several green building program reference LCA, but do not require its use in identifying environmentally preferable materials.
- *Reference established green building standards:* This approach allows project managers to follow precedent and learn from the experiences of others. This approach also provides the opportunity for a project to be certified and recognized as meeting the standards of a particular program. A drawback to this approach is that most green building programs do not require utilizing LCA in determining material recommendations<sup>4</sup>. Project

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<sup>2</sup> For further discussion of responsible materials, please refer to the Dovetail Report, “What is a Responsible Material Anyway? October, 2006. Available at:

<http://www.dovetailinc.org/reportView.php?action=displayReport&reportID=62>

<sup>3</sup> For further discussion of LCA, please refer to Dovetail Reports, “Life Cycle Analysis: A Key to Better Environmental Decisions” and “Are Life Cycle-Based Labeling and a Broadening of Environmental Certification Programs Needed?” Available at: [www.dovetailinc.org](http://www.dovetailinc.org)

<sup>4</sup> Currently only Green Globes uses LCA for evaluating responsible materials, but the USGBC’s LEED program and others have announced intentions to incorporate LCA in the future.



developers also have a reduced ability to base material selection on project specific or local considerations and values.

- *Develop project specific goals and priorities:* Project managers may identify their own goals and priorities for selecting materials, especially for areas and projects where established green building standards are not readily available or are incompatible with the project objectives. In 2006, Dovetail Partners constructed an eco-affordable home in Aitkin, Minnesota. Working with community members and project partners, a definition for how the project would select materials was developed. Because the local state and county-managed forests and additional private lands in Aitkin County are FSC-certified, the decision was made to show highest preference for local, FSC-certified materials from the local certified forests and wood product companies.

Using local materials can be a key consideration in identifying responsible building materials. Local materials promote sustainability by reducing transportation costs and impacts, and they also offer the potential to expand residential development projects and affordable housing programs into economic development opportunities with a broader impact on the community.

#### *Self-Sustaining Sites*

A self-sustaining site is a home or development that is designed to meet its own energy needs on-site, for example by utilizing solar, geothermal, hydro, or wind power. This type of self-sufficiency can greatly reduce operating costs and be highly compatible with affordable housing interests so long as the upfront construction costs are manageable.

At Greenbuild 2006, a national green building event held annually in the United States, the Cascadia Region Green Building Council announced the Living Buildings Challenge. The proposed challenge is to develop the highest green building standards possible, including “zero energy and zero water” (meaning the site is fully self-sufficient for both energy and water needs). Similarly, the Department of Energy (DOE) has initiated Building America Programs, with a goal to develop cost-effective “Net Zero Energy Homes” by 2020. According to DOE, the zero energy homes concept “combines state of the art, energy efficient construction and appliances with commercially available renewable energy systems such as solar water heating and solar electricity, and can be designed and constructed to produce as much energy as they consume annually.” Austin, Texas, one of the first US cities to implement a green building program (in 1991) recently mandated that all homes be “zero-energy capable” by 2015. Colorado and other states are exploring the possibilities as well.

Some affordable housing projects are already taking a shot at utilizing on-site energy production. SOLARA, the first apartment community in California to be fully powered by solar, is a mixed-use affordable housing project that was certified under California Energy Commission’s Zero Energy New Homes Program. Maverick Landing, a mixed income housing project in Boston, uses solar panels on its roofs as well.

In London, a mixed-use commercial and 66 unit affordable residential project has been designed to produce its own power through wind energy. The building features a tower of wind turbines. The project, not yet named, will produce up to 15% of the building's total energy.



American developers have also begun to embrace the idea of self-sustaining sites. McStain, a Colorado green housing developer, recently added solar panels to the roofs of their already highly-energy-efficient houses. Lennar, one of California's biggest developers, now offers "solarPlus" as an option on many projects. Another California developer, Calum, has been building "almost-zero" energy homes that utilize solar panels and instantaneous water heaters. These homes are EnergyStar certified, and are also certified as Zero Energy Homes by the US DOE. While these homes are not technically built for the affordable housing market, they demonstrate a shift toward extreme energy-efficiency in housing that may one day translate to cost-effective housing innovations available to all.

### **Green Building Innovations that Don't Fit**

Not every green building trend is a good fit for affordable housing. Technologies that have unproven benefit or significantly higher upfront costs are unlikely to make sense for an affordable housing project manager. Specific techniques such as green roofs may also be inappropriate due to the non-traditional maintenance requirements. The specific green building innovations that make sense for a project are likely to vary depending on the project design, goals and location.

Sometimes the green building standards themselves are not an easy fit for affordable housing projects. To date, green building programs tend to be focused on urban areas and translating their requirements to rural communities and their affordable housing needs can be challenging. In April 2006, the Housing Assistance Council (HAC) convened a roundtable of green building and rural housing organizations. The purpose of the roundtable was to explore the specific challenges regarding incorporating green considerations into affordable housing projects in rural areas. Participants identified the green techniques they were most commonly making use of in rural projects as well as those that presented the greatest barriers (Table 1).

Table 1  
Affordable Green Building in Rural Communities

Most common green techniques being used in rural housing projects	Most common green challenges for rural housing projects
<ul style="list-style-type: none"> <li>- compact fluorescent lighting</li> <li>- ENERGY STAR appliances</li> <li>- low flow fixtures and dual flush toilets</li> <li>- environmentally preferable products</li> <li>- local sources for materials</li> <li>- construction material recycling and site waste minimizing</li> <li>- homeowner awareness education</li> <li>- integrated design processes</li> </ul>	<ul style="list-style-type: none"> <li>- compact development</li> <li>- infill development and utilization of existing physical infrastructure</li> <li>- use of public transportation and land use planning</li> <li>- access to and affordability of certain green products and systems</li> <li>- staff and contractor access and capacity</li> <li>- access to and costs of third-party verifiers</li> <li>- federal, state, and local government regulations</li> <li>- qualification for certain green affordable funding programs</li> <li>- homebuyer awareness</li> </ul>

**Is Affordable Housing Compatible with Green Building Standards?**

Although the overlap of general interests between affordable housing and green building is fairly clear, it is less clear how affordable housing is or isn't served by the formal and rigorous green building standards and certification process.

The green building certification process includes a number of direct and indirect costs. For example, the LEED-H® process requires a \$150 registration fee, a \$500 LEED® provider fee, and a \$50 certification fee (paid at project completion). In addition, consultants must be hired to conduct tests and inspections, a LEED® Accredited Professional (LEED® AP) is often needed to manage the certification process, and specific design and material elements of the project may need to be modified to comply with the standard. The same types of costs are also encountered for Energy Star Home certification, but tax incentives have made this program more accessible. For affordable housing projects where minimal construction costs are a priority, the benefits of the expenses directly related to the certification process itself are debatable without some mechanism for offsetting the costs.

**Tax Incentives Needed**

In 2006, a study demonstrated that “Zero Energy Homes in conjunction with state and federal tax incentives can accelerate and significantly improve the energy performance of the residential sector in the United States. By 2050, ZEH with a tax incentive for solar technologies can reduce the energy consumption of all single-family homes by 19 percent while, over the same time, the stock of single-family homes increases by 39 percent.”

*“The Impact of Zero Energy Homes,”  
NAHB Research Center, 2006.*

However, in the broader sense, while formal certification and the associated costs may not be justified for affordable housing projects, the use of green building standards as a reference tool and resource can provide measurable benefit.

Using green building standards during the design and planning stages can aid affordable housing developers in identifying design alternatives and opportunities for affordable innovations. Most green building standards are fairly comprehensive in offering guidance throughout the construction process and for a wide range of building components. The standards can help structure a project and ensure that diverse concerns and considerations are not overlooked. The use of the standards may help a project manager identify opportunities for greater energy-efficiency that will reduce operating costs for the future home owners, possibilities to minimize or recycle construction wastes that reduce costs, or space utilization techniques that allow the overall home size to be reduced. Even without including the certification process, green building standards provide a useful tool for broadening the vision of an affordable housing project team and there is no reason for project developers to limit themselves to only one standard as reference.

Despite the costs, affordable housing projects may still seek green building certification for several reasons. Certification may be a requirement for a specific program or funding source and certification offers the benefit of independent verification that claims and commitments have been accomplished. Several affordable housing projects around the country have achieved certified status.

- Traugott Terrace in downtown Seattle, Washington has 50 green units for low- to very low-income residents, and was certified under the city's LEED Pilot Incentive Program.
- The Folsom Dore project in San Francisco, California was certified LEED-NC silver in 2006. It utilizes passive cooling with wood-louvered balconies and makes use of a "cheerful and creative color palette."
- Part of the Green Communities Initiative, Denny Park Apartments in South Lake Union (Seattle) has 50 apartments and is aimed at households making less than 60 percent of the area median income. The project meets 159 different items on the *Seattle BuiltGreen Certification Checklist*.
- A PATH-sponsored (Partnership for Advancing Housing Technology) home in Patterson, New Jersey, demonstrates green building technologies. Called the "Near Zero Energy Home", the affordable housing project utilizes structural insulated panels, insulated concrete forms, metal roofs, solar water heaters, and radiant floor heating. Many of the materials were manufactured by BASF as part of their Better Homes, Better Planet Initiative. The project received Platinum LEED-H certification, and is being used as a template for 3,000 other affordable housing projects in New Jersey. It is said to be 80% more energy efficient than normal homes by integrating the heating, cooling, and envelope systems together.

### **Housing Needs in China**

China is a country that is extraordinarily challenged to resolve the integration between green and affordable in meeting housing needs. The solutions and innovations brought forth to address China's potential housing crisis offer examples for global green affordable housing initiatives.

With more than one billion people and an average house size that has grown from 4 m<sup>2</sup> (43 ft<sup>2</sup>)/capita in the 1980s to 20-24 m<sup>2</sup> (215-260 ft<sup>2</sup>) today<sup>5</sup> the environmental and economic impact on wood products alone is estimated to be quite substantial. As China moves forward into the next decade, the construction of over 100 million homes is expected.

In 2003 the Ministry of Construction in China approved the Future House Project, which is a demonstration project aimed at addressing the need for modern housing and environmental impact reduction. The Future House Project involves ten different partnering countries and is set to take place in six different Chinese cities. Future House USA features ground-source heating and the Chinese design elements of Feng Shui. The home's roofing system manages storm run off, and also employs an air space and a reflective heat barrier to reduce attic heat and improve airflow. The home features Energy-Star appliances and formaldehyde-free components in the kitchen, and low VOC paints and adhesives throughout. Bamboo and cork flooring are also used. The Future House USA project will be open for demonstration from 2007 to 2014, most notably during the Beijing Olympics in 2008.

The Chinese government is also working to improve the building standards, although enforcement can be difficult. The USGBC and LEED are participating in a private sector initiative to develop green building standards for China.

### **Support for Eco-Affordable Housing**

In recent years incentives for integrating green and affordable have increased. Local and national programs and organizations such as the Greater Minnesota Housing Fund, Family Housing Fund, Home Depot Foundation and Enterprise all offer incentives, guidelines or financial support for affordable housing that addresses green building criteria. Green Communities, the first national green building program to focus on affordable housing was started by Enterprise in 2004<sup>6</sup>.

The Minnesota Green Affordable Housing Guide is a web-based resource created to assist designers, builders, homeowners, and organizations to build green affordably and specifically addresses climate concerns for the State of Minnesota<sup>7</sup>. The Affordable Housing Design Advisor, developed by The U.S. Department of Housing and Urban Development (HUD), is free and focuses on green design<sup>8</sup>.

Established affordable housing developers are also increasing their participation in green building. The Greater Teton Area's Habitat for Humanity is nearing completion of its first green affordable home in Teton County, Wyoming. They are establishing their own

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<sup>5</sup> Center for International Trade in Forest Products, Univ. of Washington 2001; D. Rogoway, AF&PA 2003

<sup>6</sup> <http://www.greencommunitiesonline.org/>

<sup>7</sup> <http://www.greenhousing.umn.edu/>

<sup>8</sup> <http://www.designadvisor.org/>

green building guidelines to work from, and some of the green building practices include energy-efficiency and using recycled or reclaimed materials.

### **The Bottom Line**

The shared interests between green building and affordable housing are clear and include considerations such as energy-efficiency, reduced house size, prefabricated and modular homes, responsible materials, and self-sustaining sites. There are other additional considerations that may be justified for specific projects and regions, but some barriers still exist that create challenges for rural affordable housing projects that are trying to meet green building standards. The benefits of completing and incurring the costs of green building certification for affordable housing projects are also up for debate, but green building programs offer a useful framework for planning and designing affordable housing projects even if certification is not completed.

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