Housing Assistance Council

Affordable Green Building in Rural Communities

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While the goals of green building are easy to embrace – resource efficiency, habitat conservation, improved occupant health, – the realities of constructing green units are often difficult, particularly for affordable housing developers. These issues can be exacerbated in rural communities where capacity and spatial realities may work against some basic principles of affordable green development.

In April 2006, the Housing Assistance Council (HAC) brought together national green building organizations, local rural housing developers, funders, and other stakeholders in the sustainable housing development movement in a roundtable forum to explore affordable green housing in rural areas.[1] Rural affordable green building is an area with little current research and one that is increasingly important given the recent policy and programmatic attention to affordable green housing. Findings from the symposium and a comprehensive literature review are summarized in HAC's recent report, *Affordable Green Building in Rural Communities*, to provide insight about green design and development in rural areas.

What is Green Building?

Green building is defined as a process that creates buildings and supporting infrastructure that:

- minimizes the use of resources,
- reduces harmful effects on the environment, and
- provides healthier environments for people (Karlenzig 2005).

Affordable green building builds off this definition, adding a requirement that these practices not create undue cost burdens for low-income residents.

Components of Green Building

For the most part, HAC's report uses LEED for Homes terminology and credit subheadings. LEED for Homes has eight environmental categories which are further divided into "credits." One or more points are available within each credit, and points are achieved by meeting specified requirements.

The eight LEED for Homes program credits are:

- ***Location and Linkages*** - siting housing in proximity to the overall community's infrastructure and resources.
- ***Sustainable Sites*** - utilizing green site planning and design techniques to minimize environmental site impacts, manage surface water through permeable materials, incorporate green landscaping, and use non-toxic pest control practices.
- ***Water Efficiency*** - conserving water through low-flow fixtures such as toilets, showers, and faucets.
- ***Indoor Environmental Quality*** - incorporating ventilation systems, toxin-free materials, contaminant control, and maintenance practices that reduce indoor environmental impacts on human health including asthma, respiratory diseases, and other ailments (FHLBA 2005).
- ***Materials and Resources*** - constructing homes smaller than the national average, using material efficient framing, creating a durability plan, utilizing environmentally preferable products, employing smart waste management practices, and utilizing locally made materials and supplies.
- ***Energy and Atmosphere*** - building or retrofitting homes to make them more energy efficient through better insulation practices and the use of energy efficient appliances, fixtures, windows, lighting, water heaters, and renewable energy systems, along with properly sized and highly efficient mechanical systems.
- ***Homeowner Awareness*** - providing residents of green homes with the knowledge they need to use and maintain the green building components included in their houses.
- ***Innovative Design*** - refers to green design and construction materials that have benefits beyond those contained in the LEED for Homes rating system.

For more information on LEED for Homes standards, visit www.usgbc.org/DisplayPage.aspx?CMSPageID=147.

[1] To organize this discussion and capture the various techniques being used, HAC utilized the USGBC's Leadership in Energy and Environmental Design for Homes (LEED-H) Version 1.72 building standards. HAC does not endorse any building standard and chose LEED for Homes since it is a national building standard that takes into account local characteristics, and also to provide a common terminology for everyone to use during the roundtable.

Rural Green Experiences

Increasingly, rural affordable housing developers understand the nature of complex, overlapping social, economic, and environmental problems associated with housing and are committed to responding to them in a holistic manner. For these groups, a green building framework provides the necessary comprehensive structure to respond to these problems and ultimately to build healthier, more efficient, and environmentally sustainable housing and communities.

The roundtable provided rural practitioners with an opportunity to share their green building successes and challenges as well as identify much-needed resources.

What's Working

Rural affordable housing developers are utilizing a range of green products and techniques. Almost all of the builders participating in the roundtable use an integrated design process, implemented through a charette, before beginning construction. An integrated design process brings all members of a project team together from the outset of the design process in order to provide a shared understanding of project goals, priorities, and constraints (Bradshaw et al. 2005). This is especially important for rural affordable housing developers since it has the potential to decrease overall costs and increase support from all stakeholders.

From these planning sessions, rural green developers had identified and used a range of green building strategies in their affordable housing projects. The most common strategies identified by rural roundtable participants include:

- ***Energy and water efficient practices*** including compact fluorescent lighting, ENERGY STAR appliances, and low-flow water fixtures such as dual flush toilets;
- Utilization of ***environmentally preferable products*** such as environmentally certified materials (e.g., certified wood products) and locally sourced materials;
- ***Effective management of materials and resources***, including use of recycled construction materials on site and waste management;
- ***Minimizing environmental site impacts*** by lessening site disturbance and erosion through the use of permeable paving materials and bioswales; and
- ***Homeowner awareness*** education practices such as resident trainings and follow-up.

Benefits of Green

Rural practitioners and other stakeholders identified benefits at all levels from using green affordable housing practices, including:

- ***Lower utility and energy costs*** from using water, and energy-efficient products and well insulated homes;
- ***Improved occupant health*** by incorporating certain indoor environmental quality techniques, such as exhaust fans that improve air filtration and reduce humidity and mold concerns;
- ***Higher tenant satisfaction*** with homes that are more comfortable due to better ventilation systems and indoor air quality;
- ***Minimizing environmental impact*** by using site practices that limit the amount of storm water runoff and other strains on local infrastructure; and
- ***Supporting local economies*** by purchasing locally produced, environmentally preferable materials, which keeps money and tax dollars in the community.

Challenges

Roundtable participants identified several challenges to incorporating green strategies into affordable rural developments. These challenges are largely related to the realities of operating in rural areas. The most common challenges were:

- ***Defining Density***. Land use practices that make more effective use of developed land and encourage density are difficult in rural areas. Less dense development patterns, in many ways, define rural communities. Further, rural areas often lack water and sewer infrastructure and may have zoning regulations that limit density.
- ***Limited Capacity***. Rural organizations often are challenged to find staff and contractors with knowledge of green development practices. Those contractors who are available are not always knowledgeable about green or emerging building construction techniques, thus limiting the correct installation of some products and systems. Rural affordable developers are also challenged by access and costs of third-party verifiers and those who can confirm conformance to standards.
- ***Cost and Access***. Although roundtable participants remarked it was becoming easier to access and afford

green products and systems, many rural areas continue to struggle with finding and affording them. For example, organizations described challenges affording and accessing indoor environmental quality mechanical systems.

These issues have broader implications for rural green developers as several remarked that they have trouble qualifying for federal, state, and local government programs, many of which do not take into account the rural context. For instance, some groups cannot qualify for certain green affordable funding programs due to programmatic requirements, such as higher housing density.

Critical Resources

Organizations identified several resources that are critical to overcoming these challenges to design and develop affordable green units.

- ***Partnerships.*** Rural affordable housing developers already have to combine multiple funding sources to finance projects. Green affordable building can add complexity, so groups need additional supports when beginning green projects. Most of the groups received financial support for their green housing projects from foundations, intermediaries, government at all levels, local utility companies, and outside supporters such as universities.

- ***Planning.*** Due to the holistic nature of green building, community organizations stressed the importance of deciding early what aspects of green building to incorporate in housing projects. It is not often practical or financially feasible to integrate green facets in a project at the end. Planning early through an integrated design process can help organizations decide what is most important and viable, and is essential to minimizing cost overruns and keeping the project within budget.

- ***Standards.*** Green building standards can serve as an important learning resource for new and experienced rural community housing organizations. Green building standards provide an easy to use and structured template to identifying the many facets of green development. In addition, some green funding organizations require nonprofit developers to adhere to certain building standards when applying for and utilizing financial resources.

Green on the Ground: Indoor Environmental Quality

Bishop Sheen Ecumenical Housing Foundation, Inc. is a nonprofit corporation that provides safe, decent, and affordable housing for low-income families, seniors, and persons with disabilities in 13 counties in western New York.

Sheen Housing renovated this home to improve its indoor air quality and efficiency.

Sheen Housing offers a wide range of housing assistance programs. In the last five years, Sheen Housing has included a green initiative in its home repair and rehabilitation program. The organization provides services such as weather-stripping, properly maintained heating systems, energy efficient windows, and caulking of windows, doors, and sills to eliminate air infiltration. Sheen Housing also provides plumbing repairs, venting, replacement of damaged drywall, insulation, gutters, and roof repairs to eliminate sources of moisture or water infiltration that cause mold.

Sheen states that better indoor environmental quality (IEQ) ultimately produces a more comfortable, energy efficient, and cost effective home. Other benefits of its IEQ practices include improved health of the occupants, higher market value, and improved durability of the home. Improved IEQ has also had ripple effects throughout the community, including improved health care, reduced school transience, stabilized employment, and reduced demand on local social services.

Adapted from an article by Allynn Smith of Bishop Sheen Ecumenical Housing Foundation, Rochester, New York (HAC 2005).

Moving Forward

HAC's roundtable discussion illustrates that rural community housing organizations can develop and are developing affordable green housing, although certain characteristics of the rural environment can challenge nonprofit developers. Smart growth land use planning principles, access to and affordability of certain green products and systems, and staff and contractor access and capacity can be more difficult for rural nonprofit developers due mostly to the spatial, economic, and cultural realities of rural areas.

Even with these challenges present, community groups and green funding organizations at the roundtable were often incorporating as many green facets as possible in their affordable housing projects.

Asked to comment on future needs and supports necessary to continue green development practices, community organization representatives at the roundtable stated the need for housing intermediaries and government to provide additional training opportunities and resources for rural nonprofit developers and local government. In addition, they stressed it is important for researchers to develop green cost savings analysis techniques to help justify the benefits of affordable green building, while ideally leading to the incorporation of green criteria in loan underwriting standards. Clearly there is a need to develop additional training and technical assistance, loan products, and research in regards to rural green affordable housing.

In addition, community organizations' staff stressed the need for green funding organizations to understand the rural context. Many rural areas, especially the less populated communities, cannot meet the location and linkage criteria and are thus disqualified from certain green funding sources. Developers stated that incorporating rural considerations in this category could help rural housing organizations access greatly needed funding and ultimately help them continue building green housing for low-income rural residents.

Low and No Cost Green Development Tools[2]

- ***Avoid environmentally sensitive sites.*** Environmentally sensitive sites (e.g., wetlands, prime farmland) should be avoided due to ecological and human concerns.
- ***Minimize site impact during construction.*** Minimizing the impact (e.g., protecting and reusing topsoil) of constructing a home helps lessen the building's footprint on the site.
- ***Install high efficiency toilets, showers, and faucets.*** Low-flow water fixtures are important in green houses since faucets, showers, baths, and toilets can account for two-thirds of indoor water use.
- ***Improve air filtration, distribution, and ventilation.*** Installing and using air flow systems and exhaust fans will improve indoor air quality and resident health in the home by reducing humidity, pollutants, and odors.
- ***Build small homes and limit material use.*** The nationwide average home size continues to increase although smaller homes utilize less energy and materials. Limiting materials used for aesthetic purposes also saves resources.
- ***Construct well insulated homes.*** Improved insulation regulates the loss of heat and assists in cooling, thus allowing residents to use fewer resources and save money.
- ***Provide a homeowner's manual and walk-through of the green home.*** Providing a homeowner's manual, walk-through, and continuing education will help residents understand, effectively utilize, and maintain the various green facets in their home.

[2]Low and no cost green development tools are drawn from the United States Green Building Council's (USGBC) LEED for Homes program, version 1.72. Please see this document for additional resources.

References

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For more information, please access HAC's free report, *Affordable Green Building in Rural Communities*, located at www.ruralhome.org.