

# The rapid growth of green building rating systems and their impact on wood buildings

By Kenneth Bland, P.E. • American Forest & Paper Association



In 1993, the American Institute of Architects hosted a meeting to gauge interest in developing a standard for the purpose of improving the environmental performance of buildings. This meeting was the beginning of the green building revolution. In the ensuing years these first meeting participants secured government contracts to develop green building criteria.

With the newly-developed criteria as a catalyst, two of the participants formed the U.S. Green Building Council (USGBC). In 2000, USGBC released the first version of its Leadership in Environmental and Energy Design for

New Construction (LEED-NC). Since the release of LEED Version 1.0, not only have USGBC and LEED-NC continued their remarkable growth as evidenced by the current membership of 7,200 organizations and 80 regional chapters, but there have been some additional players on the green building rating systems scene, such as The Green Building Initiative, and the National Association of Home Builders.

## Background on the LEED Green Building Rating System

LEED-NC Version 2.2 is USGBC's most current release for new construc-

tion. While LEED-NC is seen as the backbone for a number of the LEED products, the entire family of LEED rating systems operates similarly as credit-driven assessment programs for rating new and existing commercial, institutional, and high-rise residential buildings. Presently, USGBC offers the following LEED programs:

- New Commercial Construction and Major Renovation projects
- Existing Building Operations and Maintenance
- Commercial Interiors projects
- Core and Shell Development projects
- Homes

- Neighborhood Development
- Guidelines for Multiple Buildings and On-Campus Building Projects

Evaluation of environmental performance is claimed to be made from a “whole building” perspective over a building’s life cycle from the design phase to demolition. However, it should be noted that no life-cycle assessment is presently employed in the process.

The following overall ratings are awarded based on the number of points accumulated in the assessment of an individual building. These assessments and point scoring are conducted by LEED accredited designers during their design process. USGBC accredits these design professionals and provides third-party review of the building’s compliance with LEED. The award categories are:

- Certified (26 – 32 points)
- Silver (33 – 38 points)
- Gold (39 – 51 points)
- Platinum (52 – 69 points)

The principal program, LEED-NC, is divided into six categories of environmental and energy performance criteria. Varying points can be earned in each and there are a total of 69 possible points. The six categories are:

- Sustainable Sites (14 points)
- Water Efficiency (5 points)
- Energy & Atmosphere (17 points)
- Materials & Resources (13 points)
- Indoor Environmental Quality (15 points)
- Innovation & Design Process (5 points)

By 2003, the impact that implementation of the LEED rating system was having on wood and some other building materials was becoming increasingly apparent. The Federal government’s General Services Administration (GSA) had been proactive in mandating the incorporation of LEED criteria into the design of federal buildings. Additionally, the Office of the Environmental Executive (OFEE) was facilitating inter-agency meetings on the development and consistency of agency recommendations toward “greening of government,” in accordance with Presidential Executive Order 13123<sup>1</sup>.

### AF&PA Concerns with LEED

While the full impact of LEED on

### GBI announces Green Globes as draft standard

The Green Building Initiative has taken another step toward establishing the Green Globes environmental assessment and rating system as an official standard under the American National Standards Institute, by publishing its commercial rating and assessment tool as a Draft Standard for Trial Use .

“By releasing Green Globes as a draft standard, we encourage users and other interested parties to provide comments,” says Ward Hubbell, executive director of the GBI. “We believe this will complement our ongoing ANSI process by soliciting more thorough comments from a broader

group of stakeholders and provide the most comprehensive feedback as we develop an American National Standard for green buildings.”

The designation of the DSTU will be GBI-01/2005-GGDSTU. Copies will be available free of charge for review from the GBI site at [www.thegbi.org](http://www.thegbi.org).

Comments can be provided via email, mail, or fax. For more information on how to provide comments or to request a hard copy of the draft standard for review, please direct inquiries to TerraChoice Environmental Marketing Inc., 800-478-0399, ext. 230, [rlaham@terrachoice.com](mailto:rlaham@terrachoice.com), or visit [www.thegbi.org](http://www.thegbi.org).

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wood products was not understood at the time, the American Forest & Paper Association (AF&PA) created an internal team to focus on changing the USGBC mindset and gaining recognition of wood as a superior environmental choice within the LEED guidelines.

Four Material and Resource Credit areas were identified in LEED-NCv2.2 as particularly troubling. Sidebar #2 provides a brief description of the Material Resource Credits identified as troubling. A review of sidebar #2 will establish why the credits may be troubling to the wood industry. The identified credits are:

- Material and Resource Credit 4 (MRc4) – Recycled Content
- Material and Resource Credit 5 (MRc5) – Local Manufacture
- Material and Resource Credit 6 (MRc6) – Rapidly Renewable Materials
- Material and Resource Credit 7 (MRc7) – Certified Wood

In 2004, industry was afforded with its first opportunity to comment on a draft LEED rating system, the one for

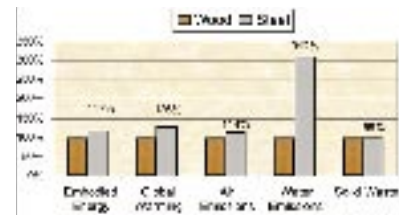
Commercial Interiors. AF&PA and its industry partners returned negative comments on the draft, including suggested changes to MRc6 to recognize the environmental attributes of all bio-based products. Additionally, comments on MRc7 encouraged the inclusion of numerous creditable wood certification standards, such as the Sustainable Forestry Initiative, not just those of the Forest Stewardship Council. From July 2004 to January 2006, there were four additional LEED guidelines released for public comment. AF&PA submitted comments on each of these subsequent guidelines. In each case, the AF&PA comments were found non-persuasive by the technical committee with a comment that USGBC would be undertaking a project to resolve wood industry concerns.

In January 2006, following attempts by USGBC to bring resolution to the wood certification issue, the USGBC Board of Directors commissioned a study on the Rapidly Renewable Resource and

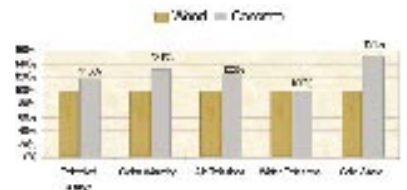
## Life Cycle Assessment Comparisons

An in-depth study by the Consortium for Research on Renewable Industrial Materials (CORRIM) used Life Cycle Assessment (LCA) to explore the environmental consequences of homes built in two representative cities.<sup>5</sup> For their analysis, CORRIM chose Minneapolis/St. Paul, Minn. to represent a heating climate and Atlanta, to represent a cooling climate. Two primary structural systems were selected for each city. The Minneapolis houses were assumed to be constructed of typical wood frame and light-gauge steel. The Atlanta houses were assumed to be constructed of typical wood frame and concrete/masonry. Five environmental impacts were examined. The following charts illustrate the environmental benefits associated with using wood framing, as determined in the CORRIM study.

The two houses in Minneapolis were modeled as wood frame and light-weight steel respectively. In the LCA analysis comparing these two homes, the environmental indicators provided the following results:



Similarly, the two houses in Atlanta were modeled as wood frame and concrete construction respectively. In the LCA analysis comparing these two homes, the environmental indicators provided the following results:



In both comparisons, the wood-framed homes showed superior results when comparing these environmental burdens.

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Certified Wood credits, both of particular interest to the wood products industry. This resulted in the issuance of a White Paper authored by Alex Wilson, Building Green Inc. As a result of the white paper recommendations, the USGBC Board released to the public the recommendations of the White Paper, as follows:

### White Paper<sup>2</sup> Recommendations

The White Paper offered two recommendations.

**1. Materials and Resources Credit 6 (MRc6)** should be changed from a rapidly renewable credit into a biobased credit, under which wood that is not derived from illegal logging would be recognized. With this change, wood certified through the Forest Stewardship Council (FSC), the Sustainable Forestry Initiative (SFI), the Canadian Standards Association (CSA), and possibly other certification systems could obtain this credit along with all of the rapidly renewable materials that are currently covered under MRc6.

**2. Materials and Resources Credit 7 (MRc7)** should be changed from a wood only credit to a credit that recognizes certified biobased materials that satisfy as-yet-to-be-developed, robust certification criteria, along with waste agricultural products such as straw-based particleboard, by definition (i.e., with-

### LEED Credits Concerning the Wood Industry

Following are the LEED-NCv2.2 material and resource credits that are of primary concern to the wood products industry.

#### Recycled Content

LEED MRc4 recognizes products that contain a minimum percentage of recycled content based on value. The steel industry uses this credit to receive an automatic two points, since most steel used in construction is manufactured from recycled content.

#### Local Manufacture

LEED MRc5 provides credits for building materials that are manufactured locally, thus supporting the local economy and reducing environmental impacts related to transportation. One point is given if 20 percent of materials are manufactured within a radius of 500 miles, and a second point is given if 50 percent of those materials (that are manufactured within 500 miles) are made from materials harvested, extracted, or recovered within 500 miles.

It is possible to source wood products that are manufactured within a 500-mile range. The most reliable source of information would be a building material supplier in the location where the building is being constructed.

#### Rapidly Renewable Materials

LEED MRc6 credit is given for use of rapidly renewable materials. One point is given if 5 percent of the total value of all building materials were manufactured from "rapidly renewable" sources. "Rapidly renewable" is defined as products that originate from plants that are harvested within a 10-year cycle.

There is very little opportunity for traditional wood products to meet these criteria. Bamboo is often cited as a renewable resource that can be used to meet the rapidly renewable requirements of LEED.

#### Certified Wood Materials

LEED MRc7 grants one point for the use of Forest Stewardship Council (FSC) certified wood products.

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out certification required). Initially, for wood products, only FSC would satisfy the Tier 2 ("Premier" or highest level) certification requirements for this credit at this stage.

However, as other certification systems for wood advance and as certification systems for bamboo, cork, or agricultural products emerge that would meet the USGBC criteria, they, too, could gain recognition under MRC7.

If this approach were to be accepted by the LEED Steering Committee and successfully balloted through the membership, consistent with USGBC's consensus processes, the number of points in LEED that could be earned for wood would double. This elevates the stature of wood as a generic material — better recognizing the fact that it is renewable, biodegradable, nontoxic, and has low embodied energy, in addition to other positive attributes — compared with non-renewable building materials. FSC-certified wood would be able to earn two points, both for MRC6 and MRC7.

The action of the council board in 2006 appears to lay the groundwork for eliminating the inherent bias against wood products in LEED. Unfortunately, it is too soon to tell whether any substantive change will be made to these credits prior to the release of LEED v3.0, which is scheduled for late 2007. In 2005, USGBC released a public comment version of LEED v2.2, which contained proposals similar to what is presented in the White Paper. USGBC membership was so opposed to the changes that they were never included in the final LEED v2.2.

### LEED Residential

USGBC also is developing a residential green building rating system, LEED for Homes. The draft guidelines are currently being pilot tested throughout the U.S., using trained LEED for Homes Providers who work closely with builders in the interpretation and application of the guideline.

There is less bias against the use of wood products in the September 2005,

draft of LEED for Homes<sup>3</sup> than what is experienced in other LEED rating systems. The Homes rating system only awards points for wood framing that is FSC certified. There are other opportunities to achieve points for FSC certified products, such as doors, windows, exterior siding, and countertops.

In 2006, there was one LEED for Homes platinum-rated dwelling located in California and six other "certified" homes under the pilot program. Like other LEED rating systems, there are four levels of certification offered (certified, silver, gold, and platinum).

### The Green Building Initiative

Throughout USGBC's brief history, it has often repeated its mission as wanting to influence the design, construction, and operating performance of the top 25 percent of new construction, presumably based on cost. In 2004, The Green Building Initiative (GBI) was created to help the National Association of Home Builders promote its Green Building

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Guidelines for Residential Structures. At that time, GBI also negotiated with the Canadian company that owns Green Globes, a green building rating system in use in Canada, to license the product for use in the United States.

In 2005, GBI made the U.S. version of Green Globes available for use. At the same time, GBI also pursued ANSI accreditation to be a standards developer and achieved this status in late 2005. The decision to pursue development of Green Globes as an American National Standard was in response to the Federal Office of Management and Budget Circular, OMB A119, which encourages federal agencies to use standards that are developed under a recognized consensus process.

As USGBC couldn't defend its claim of being a consensus-based organization, at least within the definition of A119, the GBI saw its affiliation with ANSI as appropriate and advantageous. In accordance with ANSI rules, the GBI formed a technical committee to



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oversee development of Green Globes and the GBI technical committee began its work to standardize the next generation of Green Globes early in 2006. In November 2006, USGBC was recognized by ANSI as an Accredited Standards Developer.

### Comparison of LEED and Green Globes

The approach used by Green Globes to assess a building's performance is different in many respects from LEED. Whereas LEED is a simple scoring model of up to 69 points, the GBI point total is 1,000. More importantly, Green Globes expresses its score as a percentage of total points available. Thus, Green Globes permits points to be deducted from the 1,000-point total when a particular credit is not applicable. For example, if regional mass transportation is unavailable to the building site, those points are deducted from the 1,000-point total. Thereby, the denominator is changed in calculating the percentage rating. In

this manner, building designers are not penalized for failing to include something that is in the exclusive control of others.

Unlike its LEED counterpart, the Green Globes rating system provides points for designs that select building materials based on life cycle assessment (LCA) comparisons. Points are awarded if the materials selected are the most environmentally preferable according to the LCA. Further, for use of wood products Green Globes recognizes certified wood from all credible certification schemes in the market, including the Sustainable Forestry Initiative (SFI).



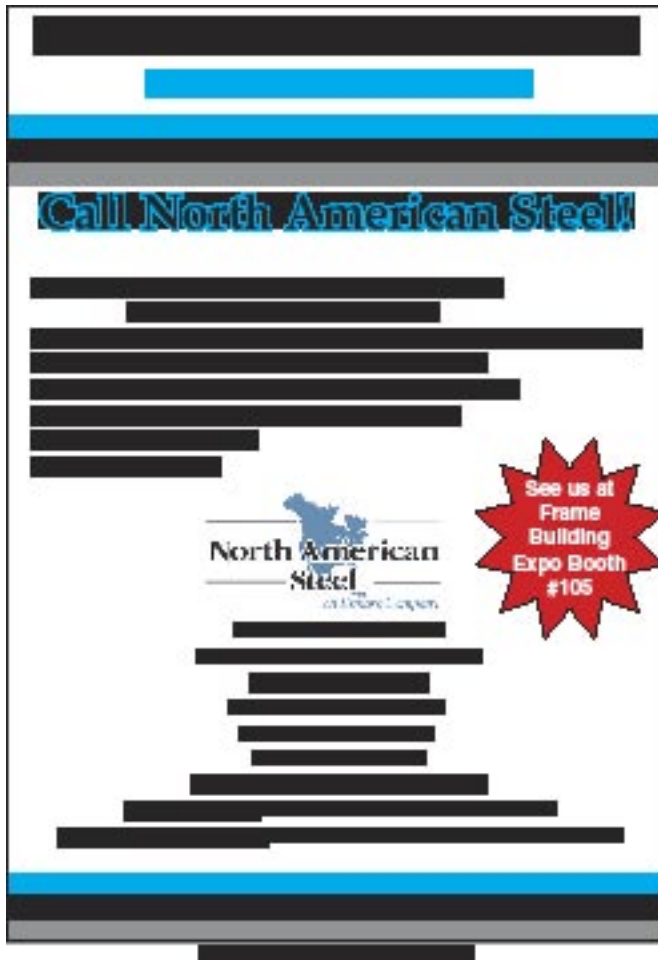
Example of an on-product SFI participant's label.

As a distinct advantage over LEED, Green Globes is available to users via the

GBI website, [www.thegbi.org](http://www.thegbi.org). As a result, the program is web-based in its use and fully interactive. Throughout the on-line session, the program provides immediate feedback to the user on ways to address or improve in credit areas where they are deficient. Green Globes also relies on the EPA Energy Target program to award credits for improved energy performance. Energy Target is a federally-maintained database that collects energy consumption statistics for commercial builders. Green Globes uses Energy Target to establish baseline performance of builders in the region and provides credits as those baselines are exceeded by the proposed building design.

### The National Association of Home Builders

In 2004, NAHB began development of the Model Green Home Building Guidelines<sup>4</sup>. The project was led by NAHB's Research Center using a process that mirrored their ANSI-accredited procedures. The Guidelines were pro-



duced to provide a model set of green building provisions for use in residential construction.

There are more than 700 local home builder associations (HBA) with membership in NAHB. Although only a small percentage of these were talking about establishing a green building program, NAHB wanted to provide a standardized set of criteria for those local programs wanting to use one. Currently, the local HBAs are provided with support from NAHB and the Green Building Initiative staff in its implementation of local programs. In 2006, Michigan became the first state to have a statewide program based upon the NAHB guidelines.

NAHB has asked the Research Center to initiate a formal ANSI consensus development process for the next version of the guidelines. Expected to begin in 2007, the current guidelines will act as a first draft of the new standard. The Research Center has yet to announce the formation of its technical committee,

but it is expected to be modeled after the technical committees that developed the original guidelines.

### American Society of Heating and Refrigeration Engineers

ASHRAE is well known as a standards-developing organization for the heating, cooling, and ventilating industry. Its standards for energy design for commercial and low-rise residential buildings are used extensively throughout the United States and cited in the Energy Policy Act of 1992. Because both LEED and Green Globes give from 15 to 25 percent of their credits for increased energy performance during the operating life of the building, ASHRAE design standards are a critical component of green building rating systems.

In 2006, ASHRAE, USGBC, and the Illuminating Engineering Society of North America (IESNA) announced the formation of a joint committee to develop a minimum standard for green

buildings. The committee is comprised of representatives from each organization. Because ASHRAE is ANSI accredited, the standard is being developed using their committee procedures. The initial work of the committee is based on similar topical areas prescribed in LEED-NC. The standard is still in draft form and isn't expected to be available for public comment until sometime in 2007.

### Summary

The American Forest & Paper Association supports the promotion of green building ratings and is an active participant in the many development opportunities. The enactment of rating systems by governmental rules or legislation should not discriminate between systems, but provide design professionals with the flexibility to use any of the creditable systems. AF&PA continues to aggressively see that legislation introduced in various local, regional, and state bodies not be restrictive. ■

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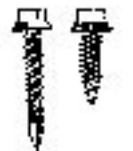


## Wood Products and Carbon Sequestration

Wood possesses significant, positive environmental attributes. Wood continues to store carbon, even as a finished product. Wood building products have an important role to play with respect to climate change policy and programs, since the carbon stored in trees continues to be stored in forest products.

The burning of fossil fuels produces air pollution and carbon dioxide (CO<sub>2</sub>), which is a principal greenhouse gas. Scientists report that greenhouse gas emissions are a significant cause of global warming, which is expected to increase the earth's temperatures and change weather patterns. Trees, during their growth phase, draw carbon dioxide from the atmosphere, release oxygen back, and use the carbon to produce wood and leaves. Through this process, trees remove

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or "sequester" large quantities of carbon dioxide from the atmosphere.

### Issue

Each year, people contribute 8 billion metric tons of carbon to the air by using energy in their daily lives. Trees and oceans absorb much of the carbon dioxide, less than half of that remains in the atmosphere to warm the planet. Balancing the generation and absorption of carbon has become a recent focus of scientific research. Concerns over forest harvesting around the globe sometimes prompt consumers to turn to non-renewable materials, whose production generates more pollution than wood does. Governments and communities that seek to address the carbon balance are not always aware of the role wood products play in minimizing impacts on the environment and thus the attributes of wood are not being fully recognized in the design of sustainable

communities, building rating systems and procurement policies.

### What You Need to Know

When a tree is cut down, the carbon it stored during its life cycle is retained within its cellular structure. The harvesting of trees and manufacturing of forest products transfers the carbon from the forests to the products. Those products, when used as building materials, remain in use and store carbon for long periods of time.

Harvesting older trees helps keep the forests young while at the same time locking up carbon in our buildings. From this perspective, it is better to harvest a forest before it is over mature. Sustainable forest management practices ensure that the carbon absorbing properties of the forest are preserved. Sustainable forestry, in conjunction with widespread use of wood as a construction material, is a

simple and cost-effective way to mitigate greenhouse gas emissions.

### References

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