



# Selling Wood Products to the Green Building Market

A Guide for Wood Product Manufacturers:  
Understanding Green Programs (LEED and Green Globes)

Version 1.0 - February 2009

Patrice Tardif

Jennifer O'Connor

FPInnovations - Forintek Division

Energy and Environment Group

#### Financial Acknowledgement

FPInnovations – Forintek Division thanks Forestry Innovation Investment and Natural Resources Canada (Canadian Forest Service) for their financial support



# Table of Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Purpose of this guide	3
1.2	The meaning of green	3
1.3	What makes a product green?	4
1.4	What is green building?	4
<b>2</b>	<b>Understanding Green Building Programs</b>	<b>5</b>
2.1	LEED	6
2.2	Green Globes	6
2.3	How does the point system work in these programs?	7
2.4	How do wood products fit into these programs?	9
<b>3</b>	<b>Making the Decision To Go Green</b>	<b>11</b>
3.1	Are we at a disadvantage if our product isn't perceived as green?	11
3.2	How important is it to target LEED?	12
3.3	The long-term view	12
3.4	Changes to consider	13
<b>4</b>	<b>Becoming Ready for LEED or Green Globes</b>	<b>13</b>
4.1	Construction Waste	14
4.2	Resource Re-use	15
4.3	Recycled Content	16
4.4	Regional Materials	17
4.5	Renewable Materials	18
4.6	Certified Wood	19
4.7	Durability, Adaptability, Disassembly	20
4.8	Materials with Low Environmental Impact	21
4.9	Low-Emitting Materials	22
4.10	Acoustic Comfort	24
4.11	Innovation in Design	25
<b>5</b>	<b>Documenting Your Green Process</b>	<b>26</b>
5.1	Knowing the documentation requirements of each program	26
5.2	Putting together an environmental documentation kit	27
<b>6</b>	<b>Marketing Your Green Products</b>	<b>27</b>
6.1	Establishing a green presence on your website	27
6.2	Listing in green product directories	28
6.3	Obtaining third-party certification	29
6.4	Conducting life-cycle assessments	30
<b>7</b>	<b>Summary</b>	<b>30</b>
	<i>APPENDIX A: Resources for more information</i>	31
	<i>APPENDIX B: LEED FAQs</i>	32
	<i>APPENDIX C: Sample documents for an environmental documentation kit</i>	34
	<i>Summary Sheet – Environmental information</i>	35
	<i>Details – Salvaged components</i>	36
	<i>Details – Recycled content</i>	36
	<i>Details – Rapidly renewable content</i>	37
	<i>Details – Regional materials content</i>	37
	<i>Details – Certified wood content</i>	39
	<i>Details – Emissions</i>	40
	<i>APPENDIX D: Detailed Specifications for Low-Emitting Materials</i>	41



---

# 1 Introduction

*This guide focuses on the Canadian versions of LEED and Green Globes for non-residential or multifamily buildings.*

## 1.1 Purpose of this guide

Manufacturers are increasingly asked by their customers to supply “green” products for use in “green” or “sustainable” building. This trend is driven by many issues we see or hear about in the media daily – for example, concerns over resource depletion, greenhouse gas emissions and global warming, waste generation and occupant health.

In recent years, the construction sector in particular has been identified as being a significant energy and materials consumer, as well as a significant source of greenhouse gas emissions. Various levels of government have targeted the sector as one that needs to improve its performance to meet “sustainable living” objectives. As well, customers have become more environmentally conscious. The entire construction sector is under pressure to become more “green”.

This guide has been written to help wood product manufacturers start or enhance a “greening process” that can enable them to meet the new market demand for environmental responsibility. The guide:

- explains what “green” means as it applies to construction products and building;
- explains how the two major green design programs, Leadership in Energy and Environmental Design (LEED®) and Green Globes™, work;
- outlines what factors to consider in making a decision to “go green”;
- provides step-by-step instructions for how to align wood products with LEED and Green Globes; and
- suggests options for how to get green products recognized in the marketplace.

This guide focuses on the Canadian versions of LEED and Green Globes for non-residential or multifamily buildings. Guidance provided here is specific to those applications, however, general principles discussed here also apply to the US versions of these programs and to programs addressing smaller residential projects such as single-family homes and townhouses.

## 1.2 The meaning of green

No standard definition exists of “green” in the context of environmental design. This has led not only to some confusion among all players in the market, but also to some misuse of the word – unwittingly or intentionally. (“Greenwashing” describes advertising that overstates a product’s green attributes or knowingly misleads consumers.) In general, then, green is usually just described in subjective terms rather than being defined according to an objective, science-based set of characteristics.

Despite this lack of a hard definition, there is a body of common understanding about many aspects of what it means to work with green products and green building.

### 1.3 What makes a product green?

At present, green wood products are generally accepted as being those that are made completely from or that include:

- wood sourced from a sustainably managed forest;
- composite products – for example, panel products such as medium-density fibreboard (MDF) – that contain recycled content;
- composite products that contain no added urea-formaldehyde, to address health concerns about formaldehyde emissions;
- wood coatings (finishes) with minimal volatile organic compounds (VOCs);
- products that are sourced locally, to reduce environmental impacts of transportation.

This list represents popular opinion about wood, and it is neither complete nor necessarily accurate. For example, wood's renewability, its ability to store carbon, and the energy efficiency of wood product manufacturing are not currently valued on a broad basis by those seeking green products.

*In some of the world's markets, manufacturers are already characterizing their products with environmental metrics such as energy consumed to make the product.*

This list is expected to evolve over time as industry moves toward a performance approach to characterizing a product's greenness. At the moment, a concerned consumer may look at a single characteristic (say, recycled content or source location of the product) and simply assume that it translates into a high degree of environmental benefit. In reality, many more factors should also be considered. For example, is a local supplier really a better environmental choice than a supplier situated farther away? We can't know unless we look more closely at all of the variables that make up the environmental profile of a product. That profile certainly includes transportation mode and distance – but just as important to consider are the dozens of other environmental factors involved in the manufacture of many products.

In some of the world's markets, manufacturers are already characterizing themselves and their products with environmental metrics. Examples of these measurable indicators include (in addition to transportation mode and distance) the amount of energy consumed to make the product, and the amount of greenhouse gases emitted during manufacturing. The science involved in these calculations is called life-cycle assessment (LCA). Some North American manufacturers have already performed LCA for their products. This is an important activity for several reasons. It helps manufacturers look more closely at their manufacturing processes in seeking environmental improvements; develop the data needed for environmental labelling; and collect compelling scientific information that will give them a marketing edge over competitors.

### 1.4 What is green building?

Green building is the act of creating architecture that is green. As with green products, there is no standard definition for green building. The result is that there are about as many views of what the term means as there are construction practitioners and policy-makers. That said, green building is generally accepted as a construction process whose overall design objective is to achieve a smaller environmental footprint than conventional buildings.



*LEED and Green Globes define a set of design features that are assumed to make a building greener.*

In this effort, designers and builders make numerous choices along the way, aiming for some or all of the following results in their buildings compared to standard practice:

- reduced energy consumption;
- reduced emission of greenhouse gases;
- reduced material usage, water usage and waste;
- reduced air and water pollution;
- improved indoor environment (e.g., by achieving natural lighting, good ventilation, better indoor air quality, better functionality); and
- reduced operating and maintenance impacts.

How do design professionals and their product suppliers know what to do to achieve those results?

Historically, green design has been a specialty discipline based on a practitioner’s own interpretation and expertise that is supported by a diverse set of resources including university education, textbooks and design precedents. However, this specialty area has expanded. Since the mid-1990s, a number of green building programs have emerged with the aim of popularizing and standardizing green design, as well as providing guidelines and certification systems. This guide focuses on two of these programs – LEED and Green Globes – the two that are currently driving the non-residential green building market in North America.



## **2 Understanding Green Building Programs**

Green building programs are incentives to encourage designers and builders to practise green design. The programs also provide guidance on how to do that. Both LEED and Green Globes define a set of design features that are assumed to make a building greener. Architects incorporate as many of these features as possible, earning points for their buildings. The two programs are also certification systems: at various point levels, a building earns a “rating” and the right to identify itself accordingly.



*Green building programs recommend design measures across a broad range of building issues, from site planning to green products.*

## 2.1 LEED

LEED is a green building program that was developed in the United States in 2000. It has two management arms in North America: the U.S. Green Building Council and one of its offshoots, the Canadian Green Building Council. The two are interrelated but are considered to act separately.

The mission of the Green Building Council is “to transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy, and prosperous environment that improves the quality of life.” The LEED rating system was set up to assist this mission by attempting to bring standardization and definition to green design.

LEED programs exist for a range of building project types:

- New Construction and Major Renovations (LEED-NC)
- Existing Buildings (LEED-EB)
- Commercial Interiors (LEED-CI)
- Core and Shell (LEED-CS)
- Homes (LEED-H)
- Neighbourhood Development (LEED-ND)
- Schools (LEED-SC)
- Retail (LEED-RE)

Some of these programs exist only in pilot form at this time.

Note: The Canadian LEED program has slightly different versions of the U.S. LEED-NC, LEED-CI and LEED-H programs. Project teams for Canadian buildings in other construction categories wishing to participate in LEED should follow the U.S. versions. Canadian manufacturers supplying products to U.S. projects under the LEED-NC or LEED-CI programs should verify information in this guide against those U.S. LEED program requirements.

## 2.2 Green Globes

Green Globes is a green building program and rating system that was developed in Canada in 2000 by the private company ECD Energy and Environment Canada, along with several government and institutional bodies. It was based originally on a program started in the United Kingdom called BREEAM (Building Research Establishment’s Environmental Assessment Method). A key distinction between LEED and Green Globes is that the latter includes a life-cycle assessment aspect. However, LEED is in the process of addressing LCA as well.

In the U.S., Green Globes is licensed and overseen by the Green Building Initiative. In Canada, the program is overseen and licensed by:

- the Building Owners and Managers Association of Canada (BOMA) for existing buildings; and
- ECD Energy and Environment Canada for new buildings.

Negotiations are underway with BOMA to have it take over the licensing and oversight of both the new building and the existing building programs for Canada. Jones Lang LaSalle, a global real estate firm, recently acquired ECD Energy and Environment Canada, but Green Globes remains independent.

The mission of the Green Building Initiative is “to accelerate the adoption of building practices that result in energy-efficient, healthier and environmentally sustainable buildings by promoting credible and practical green building approaches for residential and commercial construction.” The Green Globes rating system was put in place to help bring green building into the mainstream. Green Globes programs exist for various commercial and residential types:

- New Buildings and Retrofits
  - New Commercial Buildings (U.S.)
  - New Buildings and Retrofits (Canada)
- Existing Buildings
  - Continuous Improvement of Existing Buildings (U.S.)
  - BOMA Go Green – Commercial Buildings (Canada)
  - BOMA Go Green – Shopping Malls (Canada)
  - BOMA Go Green – Multi-residential Buildings (Canada)
  - BOMA Go Green – Light Industrial Buildings – Leased (Canada)
  - BOMA Go Green – Light Industrial Buildings – Owner Occupied (Canada)
- Commercial Interiors (new or remodelled) – Green Globes Fit-Up

Some of these programs exist only in pilot form at this time. Green Globes is currently going through the American National Standards Institute (ANSI) standard development process in the U.S. and is expected to attain ANSI standard status in 2009. Once this Green Globes ANSI standard is in place, the process will likely begin to have Green Globes attain the equivalent CSA standard in Canada. The standardization of Green Globes may increase the number of users in North America.

### **2.3 How does the point system work in these programs?**

Green building programs start with recommended design measures that cover a broad range of building issues – for example, site planning to minimize site disturbance, high-efficiency heating and cooling systems to minimize energy consumption, and use of green products to minimize environmental impact.

LEED’s design recommendations are organized into six categories. Within each category, a number of optional credits are available. As well, some categories have mandatory measures, or prerequisites. An overview of the category and point system for two Canadian LEED programs are presented in Tables 1 and 2.

LEED teams attempt to earn as many points as is practically possible. A building’s score (rating) is determined by the total number of points earned. The ratings and their ranges for New Construction and Commercial Interiors are shown in Tables 3 and 4.

Only two categories in the LEED-NC or the LEED-CI programs have direct relevance to wood products: Materials & Resources and Indoor Environmental Quality. The Innovation and Design Process category can have indirect relevance to wood. These are addressed in more detail later.

**Table 1. LEED-NC (New Construction) Canada – Category Overview**

Category	Total Possible Points
Sustainable Sites (SS)	14
Water Efficiency (WE)	5
Energy & Atmosphere (EA)	17
Materials & Resources (MR)	14
Indoor Environmental Quality (EQ)	15
Innovation & Design Process (ID)	5
<b>OVERALL TOTAL POSSIBLE POINTS</b>	<b>70</b>

**Table 2. LEED-CI (Commercial Interiors) Canada – Category Overview**

Category	Total Possible Points
Sustainable Sites (SS)	7
Water Efficiency (WE)	2
Energy & Atmosphere (EA)	12
Materials & Resources (MR)	14
Indoor Environmental Quality (EQ)	17
Innovation & Design Process (ID)	5
<b>OVERALL TOTAL POSSIBLE POINTS</b>	<b>57</b>

**Table 3. LEED-NC (New Construction) Canada – Ratings by Point Ranges**

Rating	Point Range
Certified	26-32
Silver	33-38
Gold	39-51
Platinum	52-70

**Table 4. LEED-CI (Commercial Interiors) Canada – Ratings by Point Ranges**

Rating	Point Range
Certified	21-26
Silver	27-31
Gold	32-41
Platinum	42-57

The Green Globes building program rates seven areas of building environmental performance. A building achieves from one to five “Green Globes” under the program’s rating system in Canada, and from one to four “Green Globes” in the U.S.<sup>1</sup>

<sup>1</sup> It is likely that the difference in number of Green Globes between the U.S. and Canadian programs will be eliminated once the new ANSI standard is finalized. The draft standard is currently undergoing a second public review period.

An overview of the points attributed to each category for the Canadian Green Globes program for New Buildings and Retrofits is shown in Table 5.

A project or building under the Green Globes New Buildings and Retrofits program is awarded from one to five Green Globes depending on the number of points achieved. The breakdown of percentage ranges is shown in Table 6.

Only two categories in the Green Globes New Buildings program have direct relevance to wood products: Resources, Building Materials and Solid Waste, and Indoor Environment. These are addressed in more detail later.

**Table 5. Green Globes-NB (New Buildings and Retrofits) Canada – Category Overview**

<b>Category</b>	<b>Total Possible Points</b>
Project Management	50
Site	115
Energy	360
Water	100
Resources, Building Materials and Solid Waste	100
Emissions, Effluents and Other Impacts	75
Indoor Environment	200
<b>OVERALL TOTAL POSSIBLE POINTS</b>	<b>1000</b>

**Table 6. Green Globes-NB (New Buildings and Retrofits) Canada – Ratings by Percent Points Range**

<b>Rating</b>	<b>Percent Point Range</b>
One Green Globe	15 - 34%
Two Green Globes	35 - 54%
Three Green Globes	55 - 69%
Four Green Globes	70 - 84%
Five Green Globes	85 - 100%

## **2.4 How do wood products fit into these programs?**

Individual products can help a project or building earn points, but the products themselves cannot be certified through LEED or Green Globes. They can, however, be LEED or Green Globes-ready. In other words, product literature can clearly present how that product will help a green building earn points.

Manufacturers marketing their products to a green building project team will therefore appear more attractive if they can clearly demonstrate that their products will contribute to the total point tally.

The goal of a certified green building project team is for its building to accumulate as many points as practically possible. Every product in the building can make a contribution to the total tally, no matter how small of a component in the overall building materials mix the product is. Wood products can contribute to the point tally in several different ways, and the same product can help earn points in more than one credit for the same project.

The specific LEED credits that apply to wood products are shown in Table 7. The specific Green Globes categories that apply to wood products are shown in Table 8. Detailed instructions for ensuring compliance and documentation requirements for each of these categories are provided in section 5 of this guide.

**Table 7. LEED-NC (New Construction) – Credits Applicable to Wood Products**

Category	Credits	Abbreviation
Materials & Resources	Construction Waste Management	MRC2
	Resource Re-use	MRC3
	Recycled Content	MRC4
	Regional Materials	MRC5
	Rapidly Renewable Resources	MRC6
	Certified Wood	MRC7
Indoor Environmental Quality	Low-Emitting Materials	EQc4
Innovation & Design Process	Innovation in Design	IDc1

**Table 8. Green Globes-NB (New Buildings and Retrofits) – Points Applicable to Wood Products**

Area of Assessment	Sub-area of Assessment	Abbreviation*
Resources, Building Materials and Solid Waste	Systems and materials with low environmental impact	E.1
	Materials that minimize consumption of resources	E.2
	Building durability, adaptability and disassembly	E.4
	Re-use and recycling of construction /demolition waste	E.6
Indoor Environment	Source control of indoor pollutants	G.2
	Acoustic comfort	G.5

\* Abbreviations used are for ease of reference. Abbreviations are not in the current version of Green Globes, but will exist in the upcoming ANSI standard version (2009).

*About LEED nomenclature: The use of the words “points” and “credits” can be confusing. In this guideline, we have simplified some of this nomenclature for ease of use. This guideline addresses the eight LEED credits of relevance to wood, as shown in Table 7. A credit is a design measure or feature – for example, credit MRC6 says “use rapidly renewable materials.” LEED describes the intention, requirements and submittals needed to indicate that the building has incorporated that feature – in other words, has “achieved the credit.” If the credit has been achieved, then the project will earn the number of points associated with that credit – one point in the case of almost all credits.*



### 3 Making the Decision to go Green

*All marketplace indications suggest that the green design trend is not going away and is even likely to intensify.*

Environmentally conscious construction – previously a niche market interest – has become a dominant societal topic and an important market trend in the building sector. Every category of construction product is being affected by this trend.

This same environmental consciousness is leading many municipalities and federal, state and provincial agencies to adopt a green building framework, which includes using incentives such as tax deductions, tax credits or expedited permitting.

LEED's high profile is resulting in an increased adoption of LEED-specific legislation as government agencies across North America look for a mechanism to encourage green building in their jurisdictions. A few jurisdictions have also begun to recognize Green Globes. It is likely that green building legislation of various sorts will continue to grow.

#### 3.1 Are we at a disadvantage if our product isn't perceived as green?

Notwithstanding the difficulty in predicting the exact size of the green market and its future direction, all marketplace indications suggest that the green design trend is not going away and is even likely to intensify. Manufacturers would be well-advised not to ignore this trend.

If the greenness of an operation or a product is viewed on a continuum that ranges from environmentally harmful to optimally green, most manufacturers probably lie somewhere in the middle. Manufacturers should consider moving themselves somewhat up the scale or risk being left behind as their competitors "go green." This doesn't necessarily mean that you have to make major changes to processes, but a good starting point would be to at least demonstrate that yours is a business striving to bring more environmental awareness to its operations.

### 3.2 How important is it to target LEED?

Although LEED is currently very high-profile within the green building community, the program will change and other factors will challenge its level of influence. LEED has some long-acknowledged shortcomings. These are currently being addressed through proposed changes to its credit structure and are motivating the development of competing guidelines and rating systems that take a different approach. So, an important business question for wood product manufacturers is: How much should we invest in meeting the criteria of the current LEED program? The answer is that it may be prudent to take a cautious approach – that is, invest at a relatively low level in creating a LEED-ready image for products while simultaneously taking a bigger-picture view of where green design is heading.

### 3.3 The long-term view

Manufacturers may find it advantageous to look beyond LEED and its specific (and limiting) criteria for defining green products. Instead, it might be better to define an individual agenda for adopting and projecting a program of corporate sustainability. This means doing your homework to understand the environmental implications of all material sourcing and processing choices. This may require a detailed scientific examination of the product, a step that typically involves hiring a consultant to perform a life-cycle assessment. Other possible actions include looking at all aspects of your business, such as employee transportation to work, heating bills for your offices, and community involvement.

Furthermore, many manufacturers of wood-based products may not yet be communicating the *inherent environmental characteristics* of wood. This means they may be overlooking some key marketing arguments in favour of any wood product over non-wood alternatives. Examples of the inherent benefits of wood include:<sup>2</sup>

- Wood is the only major building material that is renewable in a sustainable fashion;
- Canada has the world's largest remaining natural forest. At the same time, it has had a large forest products industry for more than 100 years;
- Canada has the most certified forests of any country in the world, and accounts for nearly half of all forests certified worldwide;
- The resource extraction requirements for wood are less onerous than those for the raw materials used in the manufacture of other building materials;
- Wood product manufacturing processes contribute less to air and water pollution than do other building material manufacturing processes (e.g., generating less greenhouse gases and using less water during the manufacturing stage);
- Wood products sequester carbon absorbed during the growth of the tree for as long as the product is in use.

---

<sup>2</sup> Refer to the Resources section at the back of this guide for sources and links regarding this data.

### 3.4 Changes to consider

Adopting a greener perspective on manufacturing may require some significant changes to manufacturing processes or, perhaps only subtle adjustments to current marketing approaches. Among the possible business modifications to consider are:

- sourcing different raw materials or choosing different suppliers;
- modifying material storage procedures in the plant;
- maintaining a paper trail for all materials – for example, where they came from and what’s in them;
- obtaining third-party certification, which may include product testing;
- performing life-cycle assessments to closely examine all environmental inputs and outputs, and possibly modifying materials or processes to improve the environmental footprint;
- documenting environmental characteristics of products and plant operations; and
- assigning staff to oversee all environmental activities and to track new marketplace developments, such as changes to LEED and Green Globes.

*Targeting specific green programs has short-term market value, but for long-term value, look beyond these programs in establishing corporate sustainability.*



## 4 Becoming Ready for LEED or Green Globes

This section summarizes the market opportunities for wood product manufacturers within the LEED and Green Globes rating systems for New Buildings and for Commercial Interiors. These opportunities are classified under each area of interest, as noted earlier:

- Construction Waste
- Resource Reuse
- Recycled Content
- Regional Materials
- Renewable Materials
- Certified Wood
- Durability, Adaptability, Disassembly (Specific to Green Globes)

- Materials with Low Environmental Impact (Specific to Green Globes)
- Low-Emitting Materials
- Acoustic Comfort (Specific to Green Globes)
- Innovation in Design (Specific to LEED)

If it is believed that one or more of your products is relevant to an aspect of these building rating programs, it must then be determined whether or not to move forward by evaluating the opportunities against any challenges that would be faced in complying with the requirements. On the following pages, the challenges, requirements and documentation needs for each area of interest are clarified.

<b>4.1 CONSTRUCTION WASTE</b>	
<b>Intent:</b>	<b>Divert demolition and construction waste from landfill.</b>
Applicability	<ul style="list-style-type: none"> <li>• If the manufacturer has a system in place to recuperate waste from construction sites (take-back program), this point is applicable. Recuperated waste can be re-used as feedstock in manufacturing new products or for recycling.</li> <li>• This also applies to products from on-site demolition, or from deconstruction, that are installed in a new or renovated building on the same site.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>• This point is the responsibility of the contractor to achieve.</li> <li>• Compliance is relevant to any construction waste from the site being diverted from the waste stream, so every little bit helps.</li> <li>• The points are not applicable if the waste will be burned.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>• Requires considering logistics and economic viability of waste collection and re-use.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>• Report total weight or volume (as specified by the client) of materials removed by the supplier.</li> <li>• Describe the waste.</li> <li>• Describe how the waste was diverted.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>• Letter documenting amounts (by weight or volume) and other information required (above) of salvaged, re-used or recycled construction/demolition waste.</li> </ul>
<b>LEED Pertinence</b>	
Category	Materials and Resources
Credit	MRC2 – Construction Waste Management
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.6 – Re-use & recycling of construction/demolition waste

## 4.2 RESOURCE RE-USE

<b>Intent:</b>	<b>Incorporate used building materials and components, thereby reducing the demand for virgin materials, reducing waste and encouraging a market for salvaged materials.</b>
Applicability	<ul style="list-style-type: none"> <li>Points are applicable to manufacturers who maintain a line of used wood products that are salvaged from other buildings and used as-is or refurbished in a new project. Examples of used products include salvaged timbers that are re-manned into flooring products, or doors and frames, cabinetry, panels or windows from a deconstruction site.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>These points are applicable only to materials that are permanently installed; furniture and concrete formwork are not eligible.</li> </ul> <p><b>LEED-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>Furniture re-use is only applicable to the LEED Commercial Interiors program.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Involves increased costs in inventory, recovering process and refurbishing activities.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Supply costs (or costs of replacement, whichever is greater) of all salvaged or used building materials. (In other words, if the value of the salvaged material is below that of the new material, then the cost of the new product or its components must be reported.)</li> <li>Describe the salvaged or used status of the products, including where the salvaged materials were sourced and/or how the salvaged or used materials were modified or refurbished.</li> </ul> <p><b>GREEN GLOBES-SPECIFIC REQUIREMENTS</b></p> <ul style="list-style-type: none"> <li>Identify re-used and re-manufactured items in appropriate CSI/Masterformat specification sections.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>Letter documenting information required (above) for salvaged materials that minimize consumption of resources.</li> </ul>
<b>LEED Pertinence</b>	
Category	Materials and Resources
Credit	MRC3 – Resource Re-use
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.2 – Materials that minimize consumption of resources

### 4.3 RECYCLED CONTENT

<b>Intent:</b>	<b>Use materials with recycled content, thereby reducing the demand for virgin materials and the associated impacts from resource extraction and processing.</b>
Applicability	<ul style="list-style-type: none"> <li>Applicable to manufacturers of wood products with recycled content (e.g., particleboard, MDF).</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>Post-consumer recycled content is favoured over post-industrial recycled content. Particleboard and MDF typically contain post-industrial recycled material.</li> <li>Recycled materials must be avoided where the recycled content or recycled product could compromise indoor air quality or service performance.</li> <li>Reclaimed construction site waste material used as feedstock can count as post-consumer recycled material.</li> </ul> <p><b>LEED-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>Under LEED, all steel used in products is deemed to have a minimum of 25% post-consumer recycled content. Wood products containing steel hardware can therefore contribute to this credit.</li> </ul> <p><b>GREEN GLOBES-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>An evaluation of the post-consumer content of recycled materials should be included.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Poses possible difficulty in obtaining recycled source material and the supporting documentation to prove its recycled status.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Provide third-party certification (not required but is recommended).<sup>3</sup></li> <li>Reference recycled content standards, regulations and requirements, and provide documentation supporting the recycled content declaration.</li> <li>Provide specific recycled-content percentages for post-industrial or post-consumer material and the total cost of each product with recycled content.</li> <li>Provide the total weight of the product, and the percentage by weight of its post-consumer recycled content and its post-industrial recycled content.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>Letter documenting information required (above) for the recycled content of materials and/or evidence of certification to a recycled content program.</li> </ul>
<b>LEED Pertinence</b>	
Category	Materials and Resources
Credit	MRc4 – Recycled Content
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.2 – Materials that minimize consumption of resources

<sup>3</sup> For more information on available programs, refer to section 6.3, Third-party Certification.

## 4.4 REGIONAL MATERIALS

<b>Intent:</b>	<b>Reduce the environmental impacts resulting from transportation of materials; support the use of indigenous resources.</b>
Applicability	<ul style="list-style-type: none"> <li>Manufacturers with facilities located in proximity to areas where there is construction activity will have an advantage (products manufactured within 800 km of project sites).</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>Manufacturers should try to source their materials as close as possible to the manufacturing location.</li> <li>For recycled content in building materials, the location of the recycling facility may be used as the point of extraction, if the recycled materials are sourced within 800 km of the recycling facility.</li> </ul> <p><b>LEED-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>Manufacturers with shipping capabilities by rail or water can increase allowable distances from construction sites to 2,400 km.</li> <li>Only 80% of the mass of the product is required to meet these distance requirements; 20% of the product can be sourced from farther away.</li> <li>Furniture materials and products are not included in LEED Canada NC, but are included in LEED Canada CI.</li> <li>In LEED Canada CI, a product can contribute to regional materials with the manufacturing distance only.</li> </ul> <p><b>GREEN GLOBES-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>The specifications of locally manufactured materials should include results of life-cycle assessment to evaluate environmental impacts of extraction, harvesting and shipping of raw materials.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Poses possible difficulty in procuring source materials as close as possible to the manufacturing location.</li> <li>Poses possible difficulty in gathering information on where raw materials were extracted.</li> <li>Might incur higher cost of operating a manufacturing facility near urban centres.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Report: <ul style="list-style-type: none"> <li>the total cost of each product considered to be a regional material;</li> <li>locations of raw material extraction, interim processing and final manufacturing, plus the distances from these locations to the project site;</li> <li>mode of transportation between all locations (e.g., truck, ship, train); and</li> <li>if the product is made from multiple materials that originate from different sources: the proportion of each material (by weight in the final product), and the sourcing distances from site of extraction to the building site.</li> </ul> </li> </ul>
Documentation	<ul style="list-style-type: none"> <li>Letter documenting information required (above) for regional materials.</li> </ul>
<b>LEED Pertinence</b>	
Category	Materials and Resources
Credit	MRc5 – Regional Materials
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.2 – Materials that minimize consumption of resources

## 4.5 RENEWABLE MATERIALS

Intent:	Reduce the usage of finite raw materials by replacing them with renewable materials.
Applicability	<ul style="list-style-type: none"> <li>For LEED, this credit applies only to “rapidly renewable” materials (materials harvested in 10 years or less), such as bamboo, wool, cotton, linoleum, straw and agricultural waste.</li> <li>For Green Globes, wood products as a renewable resource are favoured.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>For LEED, no Canadian wood products meet the 10-year harvest requirement.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Poses possible difficulty in sourcing rapidly renewable materials at a cost-effective price and with performance assurances.</li> <li>Involves uncertainty in the size and value of the market for these specialty products.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>No requirement for third-party certification (but certification programs are being developed for renewable material content).</li> </ul> <p><b>LEED-SPECIFIC REQUIREMENTS</b></p> <ul style="list-style-type: none"> <li>Report the total cost of each product considered as rapidly renewable.</li> <li>Describe the rapidly renewable material in the product, and provide a statement attesting to its status as a rapidly renewable material.</li> <li>Report the weight of the product and proportion of the product by weight that is made up of rapidly renewable materials.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>Letter documenting information required (above) for renewable materials.</li> </ul>
LEED Pertinence	
Category	Materials and Resources
Credit	MRc6 – Rapidly Renewable Materials
Green Globes Pertinence	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.2 – Materials that minimize consumption of resources

## 4.6 CERTIFIED WOOD

Intent:	Encourage environmentally responsible forest management.
Applicability	<ul style="list-style-type: none"> <li>Applies to wood products from sustainable sources that have been certified through sustainable forest management standards such as the Sustainable Forestry Initiative (SFI), the Forest Stewardship Council (FSC) and the Canadian Standards Association’s Sustainable Forest Management program (CSA-SFM).</li> </ul> <p><b>LEED-SPECIFIC APPLICABILITY</b></p> <ul style="list-style-type: none"> <li>For LEED, this credit applies only to wood certified to the FSC program.</li> <li>LEED does not require a minimum volume of certified wood for this credit, it requires only that at least half of all wood used in the building be certified. This means a small amount of wood can earn this credit for a project.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>Certified wood is applicable to structural and envelope systems for new wood and materials permanently installed; for temporary installations, such as concrete formwork, this point is not applicable. Salvaged and refurbished wood are also excluded.</li> </ul> <p><b>LEED-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>Wood products with a minimum of 70% FSC-certified content and a chain-of-custody certificate can be identified as FSC-certified and would then be permitted to count as 100% of the product cost.</li> <li>Because of limited supply of FSC-certified products, this point is difficult to achieve in buildings that use a lot of wood. However, a single specialty wood product in a non-wood building can earn this point for a project all on its own.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Sourcing FSC-certified raw materials that are priced competitively may be difficult. (Gathering information on where raw materials were extracted could also be difficult.)</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Provide proof of third-party certification<sup>4</sup> (required but may not be enforced).</li> <li>Report total cost of the product and identify all wood components and proportion by cost of each wood component that is certified.</li> </ul> <p><b>LEED-SPECIFIC REQUIREMENTS</b></p> <ul style="list-style-type: none"> <li>Acquire FSC chain-of-custody certification (recommended but not absolutely required by LEED at this time).</li> </ul> <p><b>GREEN GLOBES-SPECIFIC REQUIREMENTS</b></p> <ul style="list-style-type: none"> <li>Provide a written confirmation regarding the composition of wood-based panel products, with a certification that the wood products have been monitored from origin to end consumer.</li> <li>Provide references to relevant certified wood standards, regulations, and requirements.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>Letter documenting information required (above) for certified wood.</li> </ul>
<b>LEED Pertinence</b>	
Category	Materials and Resources
Credit	MRC7 – Certified Wood
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.2 – Materials that minimize consumption of resources

<sup>4</sup> For more information, refer to section 6.3, *Third-party Certification*.

## 4.7 DURABILITY, ADAPTABILITY, DISASSEMBLY – SPECIFIC TO GREEN GLOBES

<b>Intent:</b>	<b>Extend the life of a building and its components; conserve resources by minimizing the need to replace materials and assemblies.</b>
Applicability	<ul style="list-style-type: none"> <li>• This is pertinent to: <ul style="list-style-type: none"> <li>- manufacturers of pre-manufactured components that can be assembled or fastened in a manner that reduces deconstruction waste and facilitates reassembly into new construction;</li> <li>- on-site systems or components that use snap-release connectors, friction joints, bolts, screws and clips rather than sealants; and</li> <li>- manufacturers of components that use modules or spacing that will easily accommodate and facilitate future alterations.</li> </ul> </li> <li>• Manufacturers of weather-resistant products and products using exterior adhesives may also have an advantage.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>• Proven-in-use material test reports and life-cycle costing may be used by project teams to demonstrate durability of installations, and maintenance and replacement costs and schedules.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>• Incurs increased costs for changes in resin formulations or other treatments.</li> <li>• Involves incurring costs to modify fastening systems in pre-manufactured or site-assembled assemblies to facilitate deconstruction without knowing the demand in the marketplace.</li> <li>• Poses potential for increased costs for alterations to pre-manufactured product processes that could be job-specific (modules or spacing dictated by a particular project).</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>• Provide rationale demonstrating how pre-manufactured products promote adaptability.</li> <li>• Provide material test reports, primary costs, life-cycle costs, warranty documents and maintenance requirements for products that meet specific durability criteria.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>• Design drawings and specifications for pre-manufactured or site-assembled systems documenting that the product design allows for easy disassembly.</li> <li>• Letter documenting information required (above) for materials that are durable, adaptable and easy to disassemble.</li> </ul>
<b>LEED Pertinence</b>	
None at this time, but could potentially be applicable under the Innovation & Design Process category, IDc1 – Innovation in Design. This would be for the design team to decide.	
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.4 – Building durability, adaptability & disassembly

## 4.8 MATERIALS WITH LOW ENVIRONMENTAL IMPACT – SPECIFIC TO GREEN GLOBES

<b>Intent:</b>	<b>Select materials with the lowest life-cycle environmental burden and embodied energy.</b>
Applicability	<ul style="list-style-type: none"> <li>This is applicable to manufacturers of primary structural components (columns, beams, panels) and assemblies (floor or roof systems and building envelope components), for which generic life-cycle assessments have been completed and are referenced in the databases for the ATHENA® Impact Estimator for Buildings or BEES (two LCA tools used by design professionals).</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>The project team must demonstrate “best-run” life-cycle assessment for building systems including foundation and floor assembly materials, column-and-beam or post-and-beam combinations and walls, roof assemblies, and other envelope assembly materials (cladding, windows, etc.).</li> <li>Design teams will be looking to select building assemblies with the lowest reported impact in terms of energy consumption, air and water toxicity index, global warming potential, ecologically weighted resource use and solid waste emissions.</li> <li>Wood products typically rate very well in life-cycle assessments.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>May involve costly life-cycle assessments (in the tens of thousands of dollars). However, because most wood products are already included in the databases embedded in the tools accessed by design professionals, there may be no need to go to the expense of having an assessment done.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Provide a life-cycle assessment (required) for components and assemblies under consideration. (No third-party certification is required.)</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>Materials Data Sheets, which include generic LCA data for systems under consideration.</li> <li>Letter documenting information required (above) for materials that have a low environmental impact.</li> </ul>
<b>LEED Pertinence</b>	
None at this time, but life-cycle assessment requirements are being considered for the next LEED version.	
<b>Green Globes Pertinence</b>	
Area of Assessment	Resources, Building Materials and Solid Waste
Sub-Area	E.1 – Systems and materials with low environmental impact

*Note: The ATHENA EcoCalculator for Assemblies, a free tool available on the Athena Institute website, can be used by industry to see how assemblies that are dominated by wood compare with similar assembly systems. Data for the assemblies in question must already exist in the ATHENA Impact Estimator for the EcoCalculator to be applicable. [www.athenasmi.org](http://www.athenasmi.org)*

## 4.9 LOW-EMITTING MATERIALS

Intent:	Reduce the quantity of indoor air contaminants that are odorous, potentially irritating or harmful to the comfort and well-being of installers and occupants.
Applicability	<ul style="list-style-type: none"> <li>This is applicable to manufacturers or users of paints and other coatings, sealants, adhesives and composite wood or agrifibre products (including furniture systems) for applications inside a building.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>Products must meet specified VOC emission levels or chemical-use specifications.</li> <li>Various allowances are made for products used in exterior applications and for products containing certain resin formulations.</li> </ul> <p><b>LEED-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>Composite wood and agrifibre products must contain no added urea-formaldehyde. Phenol-formaldehyde resins are allowed.</li> <li>Allowances are permitted for products that do not have a low-VOC alternative available. LEED calls these “specialty products.”</li> <li>For LEED-CI: Products more than one year old prior to installation and occasional furniture are exempt.</li> </ul> <p><b>GREEN GLOBES-SPECIFIC CLARIFICATION</b></p> <ul style="list-style-type: none"> <li>Materials, products and/or finishes must be non-toxic, chemically inert and prevent the growth of fungus, mould, bacteria or other microorganisms, mitigate pollution at source, minimize the risk of <i>Legionella</i>, and meet VOC requirements set out in the Environmental Choice Program or industry-specific equivalent for VOC emissions levels or chemicals used.</li> <li>Composite wood or agrifibre products must contain less than 380g VOC/L, as recommended by the Environmental Choice Program.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Poses possible difficulties in obtaining low-VOC coating products, as well as cost-competitive wood panel products or wood adhesives without added urea-formaldehyde.</li> <li>Involves uncertainty in the performance of some low-VOC products.</li> <li>Requires special testing and certification.</li> <li>Requires classifying stock as to date of manufacture.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Assist design teams in keeping abreast of changes in the standards.</li> <li>If installations are performed on-site, provide a list of products used along with documentation of their compliance with the specified requirements.</li> </ul> <p><b>LEED-SPECIFIC REQUIREMENTS</b></p> <ul style="list-style-type: none"> <li>Refer to Appendix D for detailed requirements of each pertinent LEED credit (EQc4.1, 4.2, 4.4 and 4.5).</li> </ul>

	<p><b>GREEN GLOBES-SPECIFIC REQUIREMENTS:</b></p> <ul style="list-style-type: none"> <li>• Provide MSDS sheets for each composite wood or agrifibre product, adhesive, sealant, etc, noting appropriate National Master Specification category and number.</li> <li>• Provide performance criteria for all sealants, paints, coatings and furniture systems that meet the certification requirements of the Environmental Choice Program or its industry-specific equivalent and document VOC emissions levels or chemicals used in those products.</li> <li>• Document urea-formaldehyde resin limits for composite wood or agrifibre products. Third party certification for low-VOC or formaldehyde-free content of composite panel products is recommended.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>• Letter documenting pertinent information required (above or in Appendix D) for low-emitting materials.</li> </ul>
<b>LEED Pertinence</b>	
Category	Indoor Environmental Quality
Credit	EQc4.1 – Low-Emitting Materials: Adhesives and Sealants and/or Sealant Primers
Credit	EQc4.2 – Low-Emitting Materials: Paints and Coatings
Credit	EQc4.4 – Low-Emitting Materials: Composite Wood and Laminate Adhesives
Credit	EQc4.5 (LEED-CI only) – Low-Emitting Materials: Systems Furniture and Seating
<b>Green Globes Pertinence</b>	
Area of Assessment	Indoor Environment
Sub-Area	G.2 – Source control of indoor pollutants

#### 4.10 ACOUSTIC COMFORT – SPECIFIC TO GREEN GLOBES

<b>Intent:</b>	<b>Attenuate the noise of structural systems; insulate primary spaces from impact noise; meet speech intelligibility requirements for various spaces and activities.</b>
Applicability	<ul style="list-style-type: none"> <li>• This applies to manufacturers of floor and wall assemblies and materials that minimize sound transmission between spaces.</li> <li>• This is also pertinent to manufacturers of sound-absorbing or reflecting interior wall partitions and furniture (e.g., desks, shelves), as well as manufacturers of solid core walls with sound-absorbing panels on both sides.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>• The design team will be aiming to minimize inappropriate sound transmission from the outside and between rooms and floors, and to insulate primary spaces from undesirable impact noise when adjacent spaces are fully occupied.</li> <li>• The team will also want to specify interior surfaces that will provide appropriate sound reverberation levels, background sound levels, sound rendition, and speech interference levels.</li> <li>• Manufacturers with appropriate field impact insulation class (FIIC) values for their products will have an advantage.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>• Incurs a cost for FIIC value testing.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>• Provide engineering design calculations and drawings finalized by a licensed acoustical engineer.</li> <li>• Provide FIIC testing reports.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>• Letter documenting information required (above) for materials meeting acoustic comfort requirements.</li> </ul>
<b>LEED Pertinence</b>	
None at this time, but could potentially be applicable under the Innovation & Design Process category, IDc1 – Innovation in Design. This would be for the design team to decide.	
<b>Green Globes Pertinence</b>	
Area of Assessment	Indoor Environment
Sub-Area	G.5 – Acoustic comfort

#### 4.11 INNOVATION IN DESIGN – SPECIFIC TO LEED

<b>Intent:</b>	<b>Credit any innovative strategy not already accounted for in the current rating system; credit projects that perform at an exemplary level in one of the already existing LEED credits.</b>
Applicability	<ul style="list-style-type: none"> <li>Although this refers to performance of the building as a whole, in some cases, manufacturers might be in a position to assist in this credit.</li> </ul>
Clarification	<ul style="list-style-type: none"> <li>A project team could favour a material with shop-applied adhesives and/or finishes that meet the VOC content for site-applied adhesives and finishes in EQc4.</li> <li>As this is a reference to overall building performance, it implies that the project team has a comprehensive strategy. Manufacturers do not typically have a direct say in strategic approaches.</li> <li>In some cases, a project can earn credit for meeting requirements found in another LEED rating system.</li> </ul>
Challenges	<ul style="list-style-type: none"> <li>Not specific to wood products.</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>Dependent on extra initiatives that the project team will try to capitalize on.</li> </ul>
Documentation	<ul style="list-style-type: none"> <li>As required to demonstrate meeting extra requirements.</li> </ul>
<b>LEED Pertinence</b>	
Category	Innovation & Design Process
Credit	IDc1 – Innovation in Design
<b>Green Globes Pertinence</b>	
Not pertinent to the Green Globes rating system at this time.	



*Manufacturers with the appropriate information ready at hand will be best positioned.*

## **5 Documenting Your Green Process**

The design team on a green project or building is usually responsible for assembling all documents required under LEED or Green Globes. Such documents include specific forms and all supporting documentation as needed for each area of interest. Some of the documentation is supplied to the design team by the general contractor or sub-trades, who in turn request environmental information from product manufacturers.

### **5.1 Knowing the documentation requirements of each program**

The LEED program requires that project teams fill out official forms from the Canadian Green Building Council (“LEED letter templates”) for each credit being claimed, along with very detailed information on product composition, costs, weights or volumes, and origins of components and raw materials.

For the most part, Green Globes does not require as much data collection as LEED does. Points for the various areas of assessment are verified based on the documentation typically supplied for a building permit (e.g., a set of working drawings and specifications). That said, when a project is seeking points in E.1 for Systems and Materials with Low Environmental Impact, documentation for life-cycle assessment studies is required. In some cases, this is easily undertaken using the ATHENA EcoCalculator for Assemblies.

## 5.2 Putting together an environmental documentation kit

Manufacturers with the appropriate information ready at hand – specifically, the “Requirements” and “Documentation” information noted in section 4 of this guide for each area of interest – will be best positioned. Your company may also find it useful to prepare an environmental information sheet for any product you may want to market as ready for LEED or Green Globes. See Appendix C for samples of what a manufacturer might prepare.

This information should be packaged with the cut sheets,<sup>5</sup> MSDS sheets<sup>6</sup> and any testing or certification documentation for each product. Such an environmental documentation kit will make the product easy to incorporate into a green-building team’s own package. Alternatively, manufacturers may be asked to prepare a specific letter or fill in a form according to the project team’s specifications, attesting to the environmental qualifications of the products with respect to the specific points or credits being sought under LEED or Green Globes certification.



## 6 Marketing Your Green Products

How do you let your customers know that your products are green? Clearly, it’s a matter of getting the right message to the right target. Here are some examples of how others are doing that.

### 6.1 Establishing a green presence on your website

Information relating your product or business to environmental matters should be evident on your website. Four different topics might be addressed:

- Your corporate commitment to sustainability;
- Information on the green aspects of wood in general (see Section 3.3);
- Information on how your specific products might be viewed as green, or as contributing to a sustainable built environment; and
- Information on how your products help earn LEED or Green Globes points.

<sup>5</sup> “Cut sheets” are any representation of the product, typically taken (“cut”) from a catalogue or brochure, but a shop drawing might also work.

<sup>6</sup> A Material Safety Data Sheet (MSDS) provides basic information on a product. It contains information on the properties and potential hazards of the material, how to use it safely, and what to do if there is an emergency. In Canada, every material controlled by WHMIS (Workplace Hazardous Materials Information System) must have an accompanying MSDS that is specific to each individual product or material (both the product name and supplier on the MSDS must match the material in use).

See the examples in Table 9 for ideas on web-based green representation. Also look at the keywords associated with your website (tags in the HTML) and consider modifying them so that search engines will locate your site easily. For example, “green cabinets” might be one of your keywords.

**Table 9. Examples of websites with green marketing features**

Lambton doors	<a href="http://www.lambtondoors.com/frame13.html">www.lambtondoors.com/frame13.html</a>
BioTimber Reclaimed Wood & Lumber Products	<a href="http://www.biotimber.com/green/">www.biotimber.com/green/</a>
TerraMai reclaimed wood products	<a href="http://www.terramai.com/sustainability/">www.terramai.com/sustainability/</a>
VT Industries wood and agrifiber doors	<a href="http://www.vtindustries.com/doors/environmental.aspx">www.vtindustries.com/doors/environmental.aspx</a>
SierraPine composite panels and mouldings	<a href="http://www.sierrapine.com/index.php?pid=34">www.sierrapine.com/index.php?pid=34</a>
Armstrong flooring	<a href="http://armstrong-commercial.ecoscorecard.com/">armstrong-commercial.ecoscorecard.com/</a>
Huber Engineered Woods	<a href="http://www.hubergreen.com">www.hubergreen.com</a>

## 6.2 Listing in green product directories

Green product directories are often a starting point for design teams looking for products. Countless directories exist, with varying degrees of credibility and transparency. Some require third-party certification before a manufacturer’s product will be listed.

It can be difficult to know which directories are worth approaching, but studying some examples (such as those shown in Table 10) will help.

**Table 10. Examples of green product directories**

SCS Certified Products Database:	<a href="http://www.scs-certified.com/ecoproducts/products/">www.scs-certified.com/ecoproducts/products/</a>
BuildingGreen (if browsing by building product):	<a href="http://www.buildinggreen.com/menus/index.cfm">www.buildinggreen.com/menus/index.cfm</a>
BuildingGreen (if browsing by LEED credit):	<a href="http://www.buildinggreen.com/menus/leedList.cfm">www.buildinggreen.com/menus/leedList.cfm</a>
Forest Stewardship Council (FSC)-certified wood products:	<a href="http://www.fsc-canada.org/FindWoodProducts.htm">www.fsc-canada.org/FindWoodProducts.htm</a>
Metro Vancouver BuildSmart directory:	<a href="http://www.metrovancouver.org/buildsmart/productdirectory/Pages/default.aspx">www.metrovancouver.org/buildsmart/productdirectory/Pages/default.aspx</a>
The EcoLogo Program:	<a href="http://www.ecologo.org/en/">www.ecologo.org/en/</a>
California Integrated Waste Management Board Recycled Content Products Directory:	<a href="http://www.ciwmb.ca.gov/RCP">www.ciwmb.ca.gov/RCP</a>
Oikos Green Building Source:	<a href="http://www.oikos.com/green_products/index.php">www.oikos.com/green_products/index.php</a>
KCMA Green Cabinet Source:	<a href="http://www.greencabinetsource.org/">www.greencabinetsource.org/</a>

### 6.3 Obtaining third-party certification

Certification is like a seal-of-approval: it's an independent verification of your claim to greenness. It can be especially useful when the green attributes of a product are not visibly evident, or for customers who are dubious of manufacturer claims in general.

Third-party certification, typically a voluntary process, is used to verify a set of criteria, claims or standards that are stated as being met by a manufacturer. It is a scientific process undertaken via reputable and unbiased third parties. This takes the guesswork out of company claims and gives those claims credibility.

Examples of third-party certifications pertinent to the wood products industry include:

- verification of adherence to sustainable forestry practices;
- chain-of-custody declarations for links to certified forest management practices; and
- material content statements, such as recycled content or no urea-formaldehyde.

The arena of product certifications is currently not standardized or regulated, making it difficult for manufacturers to know how best to approach it. There are numerous certification systems available, but they aren't all consistent with each other. For wood product manufacturers, some certification systems of relevance are shown in Table 11.

**Table 11. Examples of certification systems**

Greenguard indoor air quality certified	<a href="http://www.greenguard.org/Default.aspx?tabid=109">www.greenguard.org/Default.aspx?tabid=109</a> (VOC emissions)
Scientific Certification Systems material content certification	<a href="http://www.scs-certified.com/ecoproducts/materialcontent/index.html">www.scs-certified.com/ecoproducts/materialcontent/index.html</a> (recycled content, salvaged content, no added urea-formaldehyde)
Scientific Certification Systems emissions certification	<a href="http://www.scs-certified.com/ecoproducts/indoorairquality/about/certify.html">www.scs-certified.com/ecoproducts/indoorairquality/about/certify.html</a> (VOC emissions)
Forest Stewardship Council (FSC) chain-of-custody certification	<a href="http://www.fsc-canada.org/chainofcustody.htm">www.fsc-canada.org/chainofcustody.htm</a> (certified wood)
Canadian Standards Association Sustainable Forest Management CAN/CSA-Z809 SFM certification and chain-of-custody requirements	<a href="http://www.csa-international.org/product_areas/forest_products_marking/program_documents/CAN_CSA_Z809-020_English.pdf">www.csa-international.org/product_areas/forest_products_marking/program_documents/CAN_CSA_Z809-020_English.pdf</a> (certification requirements and guidance)  <a href="http://www.csa-international.org/product_areas/forest_products_marking/program_overview/Annex4_CoC_Standard.pdf">www.csa-international.org/product_areas/forest_products_marking/program_overview/Annex4_CoC_Standard.pdf</a> (chain-of-custody requirements)
Sustainable Forestry Initiative (SFI) chain-of-custody certification	<a href="http://www.sfiprogram.org/standard/chain-of-custody.php">www.sfiprogram.org/standard/chain-of-custody.php</a> (requirements)

Green Seal product certification	<a href="http://www.greenseal.org">www.greenseal.org</a> (multi-attribute life-cycle approach to certification; certifies products that are at the upper level of performance in their category)
EcoLogo product certification	<a href="http://www.ecologo.org">www.ecologo.org</a> (similar to Green Seal)
Cradle to Cradle (C2C)	<a href="http://www.mbd.com">www.mbd.com</a> (multi-attribute life-cycle approach, with emphasis on working with manufacturers for improvement)
SMART Consensus Sustainable Product Standards	<a href="http://www.mts.sustainableproducts.com/SMaRT_product_standard.html">www.mts.sustainableproducts.com/SMaRT_product_standard.html</a> (multi-attribute life-cycle approach)

### 6.4 Conducting life-cycle assessments

The premier method for communicating the environmental footprint of a product is to develop a full life-cycle assessment. Once you do this, you can use the information for an Environmental Product Declaration – that is, a label clearly identifying the environmental characteristics of the product (like a nutrition label on a food package).

Life-cycle assessment is the “cradle-to-grave” total accounting of all environmental inputs and outputs associated with a product. It is a rigorous scientific process that follows established international protocols. Although costly and complex, life-cycle assessment is becoming more commonplace in the manufacturing world as suppliers seek to:

- truly understand the footprint of their processes and seek ways to improve; and
- get away from unverified claims, adopting instead a quantifiable and standardized characterization method that enables fair comparisons between products.

Life-cycle assessment is also used to develop “carbon footprints,” a metric rapidly gaining attention in current environmentally conscious markets.

For more information about life-cycle assessment, contact the Athena Institute at [www.athenasmi.org](http://www.athenasmi.org).

---

## 7 Summary

Manufacturers that serve commercial, institutional and other non-residential clients are increasingly being asked to supply products for green building projects. Customers expect their suppliers to have some knowledge about green programs such as LEED and Green Globes. However, these programs are complex and contain far more information than a manufacturer would typically find relevant. This guide has been written specifically for wood product manufacturers and designed to simplify the process of understanding the requirements of green programs that are directly relevant to wood. In addition, this guide has highlighted the sustainability picture beyond the current green programs, and has suggested directions manufacturers might take in improving their overall environmental image.

## APPENDIX A: RESOURCES FOR MORE INFORMATION

**Canadian LEED documents:** LEED documents for Canada are available from [www.cagbc.org/leed/systems/index.htm](http://www.cagbc.org/leed/systems/index.htm). At this site, PDFs of the Canadian LEED rating systems and addenda can be downloaded for free. However, some documentation, such as the LEED Reference Guides (the user manuals), must be purchased, and access to some on-line information is only available to Canadian Green Building Council members. Note that membership is open to manufacturers. All information related to available documents is accessible from the above link.

**U.S. LEED materials and information specifically for manufacturers:** Available at [www.usgbc.org/DisplayPage.aspx?CMSPageID=1804](http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1804).

**Canadian Green Globes documents:** This on-line system is accessible at [www.greenglobes.com](http://www.greenglobes.com).

**U.S. Green Globes – Green Building Initiative tools:** Information on Green Globes tools for U.S. use can be found at [www.thegbi.org/green-globes-tools/](http://www.thegbi.org/green-globes-tools/). Free trials are available on the website to allow organizations to understand the requirements of the different programs.

**Monthly green design newsletter:** Environmental Building News is the leading North American publication addressing green buildings, and is an excellent resource for understanding current trends and information in green design. Many articles are of direct interest to manufacturers. This organization also has an excellent on-line information resource at [www.buildinggreen.com/about/ebn.cfm](http://www.buildinggreen.com/about/ebn.cfm).

**Environmental benefits of wood:** Three good resources include:

- Tackle Climate Change: Use Wood (Canadian Edition) (publication)  
[www.bcforestinformation.com/assets/pdf/tackle-climate-change.pdf](http://www.bcforestinformation.com/assets/pdf/tackle-climate-change.pdf)
- Canadian Wood. Renewable by Nature. Sustainable by Design (publication)  
[www.bcforestinformation.com/assets/pdf/brochure\\_june10.pdf](http://www.bcforestinformation.com/assets/pdf/brochure_june10.pdf)
- Building Green with Wood (PowerPoint presentation)  
[www.bcforestinformation.com/building-green/tools/building-green-with-wood.aspx](http://www.bcforestinformation.com/building-green/tools/building-green-with-wood.aspx)

**Canadian forestry statistics:** For certification statistics and other information, see:

- [www.certificationcanada.org](http://www.certificationcanada.org)
- [www.canadaforests.nrcan.gc.ca](http://www.canadaforests.nrcan.gc.ca)

## **APPENDIX B: LEED FAQs**

### **Do I need expertise in LEED?**

*No. LEED is a program intended for a broad range of architectural decisions, most of which are not relevant to wood product manufacturers. The information contained in this guide should be adequate background.*

### **If my products have a finish applied in my factory, do I need to worry about VOCs in the finishing products with respect to EQc4.2?**

*No. Only products applied on site and within the weather barrier of the building envelope need to comply with this credit. However, product manufacturers should allow time for products to “off-gas” when using higher VOC coating products in the factory, so as not to influence the results of any possible indoor air quality testing undertaken as part of the LEED process in other credits.*

### **What do I do about the rule for no added urea-formaldehyde? I can’t find any panels without UF.**

*You should be able to source panels made with MDI resin, for example, but perhaps outside your normal supply network. Using exterior-grade plywood or OSB is another option.*

### **Is it mandatory that my product be free of added urea-formaldehyde?**

*No. A product that contains UF can be included in a LEED building, but it will negate any chance the design team had to achieve EQc4.4. Projects earn a point under EQc4.4 if none of the wood composite products contain added UF. If your product contains UF and is installed in the building, the design team has to give up on achieving EQc4.4.*

### **I’m using wood certified to SFI or CSA-certified wood. Does that work for MRc7?**

*No. LEED recognizes only the Forest Stewardship Council (FSC) for the certified wood credit. Note, however, that USGBC is currently considering changes to this credit.*

### **Do I have to use FSC-certified wood?**

*No. Your product can still help a team earn the other credits. It just won’t contribute to MRc7.*

### **I’m using FSC-certified materials in my products. Does my business need to get FSC certification too?**

*Not at the moment, but things can change, so you should consider getting FSC-certified. You are not required to have an FSC chain-of-custody (CoC) certification for your products to help a project earn MRc7. However, you must supply the team with the FSC CoC number of your supplier(s). Note also that without your own CoC certificate, you cannot advertise your product as “FSC-certified”; you can only claim that your product contains FSC-certified materials. The cost and effort of getting an FSC CoC certificate are not high and it will assist you in providing documentation and greater assurances to your LEED-seeking customers. Furthermore, FSC certification allows a manufacturer to take advantage of FSC’s partial content rules – that is, wood products with as little as 70% FSC-certified content can be identified as FSC-certified and would then be permitted to count 100% of the product cost towards credit MRc7.*

**Can I get my product FSC-certified?**

*Yes, if you meet the criteria. See [www.fsccanada.org/chainofcustody.htm](http://www.fsccanada.org/chainofcustody.htm) for more information.*

**What does “locally produced” mean?**

*For at least 80% of the mass of your product, the distance from your factory to the construction site is less than 800 km if your product is transported by truck, or less than 2,400 km if transported by rail or ship. For LEED Canada NC (New Construction), the source of your raw materials must also meet these radius requirements.*

**What adhesives can I use?**

*Adhesives used in lamination applied in the factory must be free of urea-formaldehyde when credit EQc4.4 is being pursued. Laminating adhesives have no other restrictions. Any type of adhesives that are applied on the project site, within the waterproofing layer of the building, must meet the VOC limits as described in the requirements for credit EQc4.1. For systems furniture materials, adhesives used must meet VOC limits as described for credit EQc4.5.*

**How do I get my product LEED-certified?**

*You can't. Buildings are certified, not products. Products can only help a building earn points towards certification. However, you can advertise your product as “LEED-friendly” or “LEED-ready.”*

**Can my product help a project earn points for more than one credit at the same time?**

*Yes. Wood products can easily meet requirements for multiple credits. For example, a locally produced product with no added urea-formaldehyde and containing FSC-certified wood could contribute towards three credits.*

## **APPENDIX C: SAMPLE DOCUMENTS FOR AN ENVIRONMENTAL DOCUMENTATION KIT**

The documentation examples found below are for hypothetical wood cabinets that will be used on an imaginary LEED project. Note that much of the information is equally applicable to a Green Globes certification. Most real products will not have as many green-friendly properties as shown in this example. This complex example, however, helps illustrate all possibilities.

Documentation should probably start with a summary sheet that contains basic supplier contact information and a summary table of environmental characteristics. Next should come detailed sheets for each relevant area of interest – in this case, for each LEED credit. For Green Globes, prepare similar detail sheets according to each relevant Green Globes sub-area, and modify the summary sheet as needed.

Use the examples that follow here as a model and customize for each product. Remove sections or line items that do not apply to your operation or product. Notes shown in italics in the examples are explanations for how to create the tables and should not be included in the final document package.

Supporting documentation should also be included in the “kit,” such as cut sheets, MSDS sheets, certifications and testing data as appropriate. Consider adding a cover sheet or title page to the whole package indicating that it is “Environmental Documentation” or something similar.

The design team might accept a package like this as is or may ask you to fill in particular forms they’ve created. In the latter case, the same information as you have in your kit will likely be requested, but in a slightly different format. Having pre-assembled the information according to the documentation examples provided here will make it easier for you to fill out these forms.

A third alternative to preparing a full documentation kit or filling in the team’s forms is to simply report all of your data in a letter addressed to the project manager. The design team or the contractor will give you instructions as to preferred documentation method.

## SUMMARY SHEET – ENVIRONMENTAL INFORMATION

Product	Wood cabinets <i>(add specific product identifiers if appropriate)</i>
Manufacturer:	Smith Millwork Company
Contact Information:	123 Main Street, Edmonton AB <i>(name, phone, etc, as appropriate)</i>
Date:	October 17, 2008
Project:	ABC office building, 456 25th Avenue, Calgary AB

### Summary Information:

Total value of product	\$150,000	← Includes total material costs, labour and other costs of production, but excludes installation costs.
Value minus salvaged materials	\$145,000	← Same as above, but without salvaged materials.
Total recycled content	21.0%	Post-industrial
	9.5%	Post-consumer
Total regional content	94.2%	Extracted locally
	99.6%	Processed locally
	100.0%	Manufactured locally
Total rapidly renewable content	2.1%	
Total FSC-certified wood	12.0%	
Added urea-formaldehyde	No	

*This sheet captures all of the information that the LEED team really needs. Remove rows that are not applicable. The following pages explain how to calculate the numbers that go on this sheet.*

## Details – Salvaged Components

Value of the salvaged materials	\$5,000
Weight of the salvaged materials	125 kg
Description of the salvaged content	Some of the cabinet boxes were recovered from a demolished building in Edmonton. Refurbishing consisted of nail removal and sanding.

← Insert value of this component as if it were new, if the replacement value is greater than the value of the salvaged materials.

## Details – Recycled Content

**Total Value of the Product: \$145,000 (excluding salvaged materials)**

Component	Weight (kg) or Value (\$) ( <i>circle one</i> )	Proportion of Total Assembly	Recycled Content <sup>2</sup>	
			Post-Industrial (%)	Post-Consumer (%)
MDF	1,000	85.1%	25%	10%
Wood Veneer	n/a		0%	0%
Bamboo Veneer	n/a		0%	0%
Adhesive	n/a		0%	0%
Steel Hardware <sup>1</sup>	45	3.9%	0%	25%
<b>Total Assembly</b> (excluding salvaged materials)	<b>1,175</b>		<b>21.3%</b>	<b>9.5%</b>
	↑ Insert the full weight or value <sup>3</sup> of each component that has recycled content.	↑ Divide component weight by total weight (e.g., for MDF: $1,000 \text{ kg} \div 1,175 \text{ kg} = 0.851$ ).	↑ For the total calculation here: $0.25 \times 0.851 = 0.213$	↑ For the total calculation here: $0.10 \times 0.851$ plus $0.25 \times 0.039 = .095$

<sup>1</sup> LEED deems all steel to have 25% post-consumer recycled content. No supporting documentation is required unless a claim for higher than 25% is being made.

<sup>2</sup> Enter recycled proportions by weight or value. Attach supporting documentation if available.

<sup>3</sup> If the recycled portion of a product is lightweight, it may be more advantageous to prepare this calculation in terms of value.

## Details – Rapidly Renewable Content

<b>Description of the rapidly renewable content:</b>	<b>Some of the cabinet faces are laminated with a bamboo veneer</b>
<b>Total value of the product:</b>	<b>\$145,000 (excluding salvaged materials)</b>

Rapidly renewable component(s)	Weight (kg)
Bamboo veneer	25
Total assembly (excluding salvaged materials)	1,175
<b>Total rapidly renewable content as a percentage</b>	<b>2.1%</b>

(25 ÷ 1,175 = 0.021)

## Details – Regional Materials Content

Raw Materials					
Component	Weight (kg)	% of Total Weight <sup>1</sup>	Origin of raw material	Distance from project site (km)	Mode of transport
MDF	1,000	76.9%	Blueridge, Alberta	425	Road
Wood Veneer	100	7.7%	Blueridge, Alberta	425	Road
Bamboo Veneer	25	1.9%	Korea	7,000	Water <sup>3</sup>
Adhesive	5	0.4%	n/a <sup>2</sup>		
Hardware	45	3.5%	Prince George, B.C.	1,000	Road
Salvaged Items – cabinet boxes	125	9.6%	Edmonton, Alberta	300	Road
<b>Total Assembly</b> (including salvaged materials)	<b>1,300</b>		↑ Enter location of raw material extraction (e.g., the forest, the mine).	↑ Enter the distance between raw material extraction and the location of final installation.	↑ Enter Road, Rail or Water.
<b>Total Regional Content:</b>		<b>94.2%</b>	← Add up percentages above for items with a distance 800 km or less by road and 2,400 km or less by rail or water. For this example, 76.9 + 7.7 + 9.6 = 94.2		

<sup>1</sup> Divide component weight by total weight. For example, the MDF is 1,000 kg ÷ 1,300 kg = 0.769.

<sup>2</sup> For some components, finding raw material origin may be difficult. It is acceptable to omit these, particularly for components not required in order to meet the 80% threshold (only 80% of the mass needs to meet distance requirements).

<sup>3</sup> For components that involve more than one mode (e.g., ship and truck) consult with the design team for advice on how to show this data.

Details – Regional Materials Content (continued)

Processing					
Component	Weight (kg)	% of Total Weight	Location of plant	Distance from project site (km)	Mode of transport
MDF	1,000	76.9%	Blueridge, Alberta	400	Rail
Wood Veneer	100	7.7%	Blueridge, Alberta	400	Road
Bamboo Veneer	25	1.9%	Vancouver, B.C.	1,000	Rail
Adhesive	5	0.4%	China	7,000	Water/Road
Hardware	45	3.5%	Prince George, B.C.	600	Road
Salvaged Items – cabinet boxes	125	9.6%	Edmonton, Alberta	300	Road
<b>Total Assembly</b> (including salvaged materials)	<b>1,300</b>	<b>100%</b>	<i>See previous table for instructions. This data addresses distances between final installation and interim processing facilities, if any. For example, the MDF and veneer manufacturing facilities are recorded here, for this sample product.</i>		
<b>Total Regional Content:</b>		<b>99.6%</b>			

Final Manufacturing	
Total assembly weight (including salvaged materials)	1,300 kg
Manufacturing location	Edmonton, Alberta
Distance from manufacturing facility to project site	300 km
Mode of transportation	Road
<b>Total Regional Content</b>	<b>100%</b>

*This data addresses the distance from the cabinet manufacturing facility to the final installation. Total regional content in most cases for “final manufacturing” is either 0% or 100% – that is, either the factory is within the required radius or it is not.*

## Details – Certified Wood Content

Total value of the product:	\$145,000 (excluding salvaged materials)
Is the entire product FSC-certified?	No (Yes or No)
<i>If yes, use this line:</i> FSC Chain-of-Custody Number:	(insert number)
<i>If no, use this table:</i>	

FSC-Certified Components	Cost	FSC CoC#
Wood veneer - certified	\$15,000	<i>Insert chain-of-custody number from the supplier of this material.</i>
Total material cost of assembly	\$125,000	← <i>This is a different value figure than used elsewhere. In this case, use only actual costs of the material alone, excluding all labour, overhead and other costs, and excluding salvaged materials.</i>
<b>Proportion FSC-Certified Content</b>	<b>12 %</b>	← $15,000 \div 125,000 = 0.12$

## Details – Emissions

Does the product contain added urea-formaldehyde?	No (Yes or No)
Will the manufacturer be applying adhesives, sealants, paints or other coatings on site?	No (Yes or No)
<i>If yes, use this table:</i>	

Product Description	Regulation Reference and Compliance (Yes or No)	VOC Content (g/L)
<b>Adhesives and Sealants</b>	<b>SCAQMD Rule #1168</b>	
<i>Insert name/description of product, if applicable.</i>	<i>Insert Yes or No.</i>	<i>Insert VOC content of the product.</i>
<b>Paints</b>	<b>Green Seal GS 11</b>	
<i>As above, for paints</i>	<i>Insert Yes or No.</i>	<i>Insert VOC content of the product.</i>
<b>Anti-Corrosive Coatings</b>	<b>Green Seal GC 03</b>	
<i>As above</i>	<i>Insert Yes or No.</i>	<i>Insert VOC content of the product.</i>
<b>Other Coatings</b>	<b>SCAQMD Rule # 1113</b>	
<i>As above (wood finishes go here)</i>	<i>Insert Yes or No.</i>	<i>Insert VOC content of the product.</i>

*If these types of products are used in the factory, LEED teams may be interested in knowing the data in the above table even though factory-applied products are not applicable to the LEED EQ credits. The LEED team may still be able to earn an Innovation credit if sourcing products that go beyond the LEED requirements – in this case, if a LEED on-site EQ requirement is adopted for factory product usage as well.*

## APPENDIX D: DETAILED SPECIFICATIONS FOR LOW-EMITTING MATERIALS

As noted in Section 4 of this guide, there are specific detailed requirements in LEED addressing indoor air quality concerns. The Indoor Environmental Quality LEED credits EQc4.1, 4.2, 4.4 and 4.5 all indicate rules and standards that must be met, along with specific documentation requirements. The specific requirements for each credit are noted below.

- EQc4.1:
  - Adhesives, sealants and sealant primers used on site must meet pertinent California State South Coast Air Quality Management District (SCAQMD) Rule#1168<sup>8</sup>.
  - LEED-CI specific: Site-applied aerosol adhesives used inside the building must meet Green Seal Standard GS-36 requirements<sup>9</sup>.
  - A list of such products used on site, documenting that they meet the pertinent rules, must be provided.

Note: Adhesives and sealants applied to siding, roofing, exterior shutters, the exterior portion of window frames, etc., and factory-installed adhesives, sealants and sealant primers are exempt.

- EQc4.2:
  - Interior paints used on site must meet VOC and chemical component limits of Green Seal's Standard GS-11 requirements<sup>10</sup>, and
  - the VOC content of anti-corrosive coatings must be lower than the limits of Green Seal's Standard GC-03<sup>11</sup>, and
  - the VOC content of all primers, under-coatings, sealers and clear wood finishes not covered by the above must be lower than the limits of SCAQMD Rule # 1113<sup>12</sup>.
  - A list of interior paints used on site, documenting that they meet the pertinent requirements, must be provided.

Note: The VOC content of paints and coatings for exterior applications is not restricted.

- EQc4.4:
  - Composite wood and agrifibre products must contain no added urea-formaldehyde. A statement to that fact, which ideally includes the Material Safety Data Sheet (MSDS) for the product and its components, must be provided.
  - If sourcing wood panels from others, you must obtain a statement or MSDS indicating that no urea-formaldehyde resins were used.
  - If using adhesives in the shop, obtain MSDS or a statement from adhesive supplier indicating that the products contain no added urea-formaldehyde.

---

<sup>8</sup> For SCAQMD Rule #1168, see: <http://www.aqmd.gov/rules/reg/reg11/r1168.pdf>

<sup>9</sup> For GS-36, see: [http://www.greenseal.org/certification/standards/commercial\\_adhesives\\_GS\\_36.cfm](http://www.greenseal.org/certification/standards/commercial_adhesives_GS_36.cfm)

<sup>10</sup> For GS-11, see: [http://www.greenseal.org/certification/standards/paints\\_and\\_coatings.pdf](http://www.greenseal.org/certification/standards/paints_and_coatings.pdf)

<sup>11</sup> For GC-03, see: <http://www.greenseal.org/certification/standards/anti-corrosivepaints.pdf>

<sup>12</sup> For SCAQMD Rule #1113, see: <http://www.aqmd.gov/rules/reg/reg11/r1113.pdf>

- EQc4.5 – LEED-CI only:  
Third-party certification for systems furniture and seating is required, for which there are two options:
  - Option A is for Greenguard indoor air quality certified products;
  - Option B is for products that meet emissions limits determined using U.S. EPA Large Chamber Test Protocol undertaken by an independent laboratory.  
Testing must be completed before the start of manufacturing, but no earlier than 24 months prior to the last manufacturing date.

*Emissions limits for systems furniture are:*

- Total VOCs: 0.5 mg/m<sup>3</sup>
- formaldehyde: 50 parts per billion
- total aldehydes: 100 parts per billion
- 4-phenylcyclohexene: 0.0065 mg/m<sup>3</sup>

*Emissions limits for seating are:*

- Total VOCs: 0.25 mg/m<sup>3</sup>
- formaldehyde: 25 parts per billion
- total aldehydes: 50 parts per billion
- 4-phenylcyclohexene: 0.00325 mg/m<sup>3</sup>

Statements are required that list product line, item description, period of manufacture, form of compliance and:

- for Option A: the start and end dates of certification, including a copy of product certification;
- for Option B: details of the testing procedure and emission factors (including calculations used to determine emissions limits), as well as the air exchange rate to demonstrate that emissions limits have not exceeded set limits, all dated and signed by an officer of the independent laboratory where testing was conducted.

If an audit is requested during the certification process, the following must be supplied:

- for Option A: shop drawings, MSDS sheets, signed attestations or other official literature that clearly identifies product emissions rates;
- for Option B: copies of reports on emissions rates established by testing.

- Provide a Specialty Product statement, if applicable.