



Building
Green with
Wood in **B.C.**

MODULE 12

Green
Building Tools

Finding the Right Tools

While the increased interest in sustainable building design has encouraged research into building products and performance, it continues to be a challenge to measure the overall impact of buildings on the environment over the course of their service lives – and advice is often contradictory.

Product directories, rating systems and other tools are available to support design and construction decisions. However, these must be evaluated carefully to ensure they meet the specific needs of each application, and to identify any limitations. For example, some green building rating systems may be too narrowly focused, ignoring the importance of far-reaching strategic decisions, while rewarding less important ones disproportionately.

Green building tools include:

- Product labelling by third-party certifiers such as independent forest certification programs
- Rating systems that evaluate products/designs such as LEED (Leadership in Energy and Environmental Design), Green Globes and the National Association of Home Builders (NAHB) National Green Building Standard
- Practice guidelines such as green home building guidelines
- Software such as the Athena Institute's EcoCalculator and Impact Estimator
- Procurement policies such as the U.S. Environmental Protection Agency's environmentally preferable purchasing
- Environmental Product Declarations (EPDs)

Library Square, Kamloops, B.C.
Architect: JM Architecture Inc.
Photo: Martin Knowles

Green design requires smart tools to decipher all the conflicting information, lack of clarity on definitions, and a constantly changing landscape as the field evolves and expands.



Product Labelling and Certification

As demand grows for products and designs that represent a sound environmental choice, more companies are labelling their products as “green.”

TerraChoice Environmental Marketing has produced a report called the *Seven Sins of Greenwashing* (www.sinsofgreenwashing.org) that offers criteria to help consumers judge whether a product or program is environmentally beneficial. It includes a list of some of North America’s most credible eco-labels – including third-party forest certification labels, cleaning products and organic certification.

TerraChoice President and CEO Scott McDougall says a 2009 survey of 2,219 consumer products in Canada and the U.S. showed that 98 per cent of companies committed at least one Sin of Greenwashing, and some marketers are creating fake labels or false suggestions of third-party endorsement. “Despite the number of legitimate eco-labels out there, consumers will still have to remain vigilant in their green purchasing decisions,” he says.

Wood is one of the few building products backed by well-established third-party certification programs, and Canada has more certified lands than any other country.

Green Building Rating and Assessment

Environmental rating systems can help building industry professionals evaluate and differentiate their product or design. The standards set by rating systems generally exceed those required by building codes.

The best systems measure performance rather than prescribe solutions, and are based on life cycle assessment. They offer a credible, consistent basis for comparison, evaluate relevant technical aspects of sustainable design, and should not be too complex or expensive to implement or confusing to communicate.

Most developed countries have adopted one or more green building rating systems, beginning with the United Kingdom, which introduced the BREEAM (Building Research Establishment Environmental Assessment Method) in 1990. In North America, green rating systems include LEED, Green Globes and the NAHB National Green Building Standard. A choice in rating systems helps to strengthen green design, with processes to meet the diversity of building needs, sizes and budgets. It also encourages market competition, ensuring continuous improvement.

The LEED green building rating system, developed by the U.S. Green Building Council, addresses specific building-related environmental impacts using a whole building environmental performance approach. In addition to LEED-NC (for new construction and major renovations), there are versions for existing buildings, commercial interiors, core and shell, homes, and neighbourhood development. In 2013, the US Green



Building Council (USGBC) released the latest version of the LEED green building rating system (LEED v4). For information in the United States: www.usgbc.org/LEED/. For information in Canada: www.cagbc.org

Green Globes is a web-based environmental assessment and certification system that bills itself as offering an effective,

practical and affordable way to assess and improve the sustainability of new and existing buildings. In the U.S., it is offered exclusively by the Green Building Initiative (GBI) who initiated the first ANSI standard for commercial green building. In Canada, the federal government uses the Green Globes suite of tools and it is the basis for the Building Owners and Managers Association of Canada’s (BOMA) “Go Green Plus” program. For information in the United States: www.thegbi.org. For information in Canada: www.greenglobes.com



The NAHB National Green Building Standard is

the first green building rating system to be approved by the ANSI. Building on the Model Green Home Building Guidelines developed by the NAHB Research Centre, it provides a common benchmark for recognizing and rewarding green residential design, development, and construction practices in the United States. Known as ANSI/ICC 700-2008, the National Green Building Standard is a joint effort between the International Code Council and NAHB. More information is available at www.nahbgreen.org



Environmental Data Sources: Life Cycle Assessment

Software

Life cycle assessment software allows a designer to capture and account for the breadth of environmental and economic considerations in one application.

The **Building for Environmental and Economic Sustainability** (BEES) software program was created by the U.S. National Institute of Standards and Technology. BEES has 10 impact categories: acid rain, ecological toxicity, eutrophication, global warming, human toxicity, indoor air quality, ozone depletion, resource depletion, smog and solid waste. For more information: www.wbdg.org/tools/bees.php

The **Athena Institute** is a non-profit organization that provides life cycle assessment services and tools to support green building. Its Impact Estimator for Buildings is a full-capability tool that allows designers to evaluate the environmental impact of each decision as they go through the process of putting a building together conceptually. Its EcoCalculator is a simplified tool, where hundreds of common building assemblies have been pre-calculated, requiring minimal input from the designer. For more information: www.athenasmi.org/our-software-data/overview/

Globally, governments are introducing policies to reduce greenhouse gas emissions and support their sustainability programs. Examples include:

- In The Netherlands, the 2012 building code requires LCA data to be submitted for each new building, and a total 'environmental shadow cost' must be

calculated per square meter of building area in order to get a building permit.

- The UK government will require new homes to be 'zero carbon' beginning in 2016, and is considering extending this to all buildings as of 2019.

Other policies go further, explicitly recognizing the benefits of forestry and wood use:

- In France, the government requires that new public buildings have at least 0.2 cubic meters of wood for every 1 square meter of floor area.
- In New Zealand, wood or wood-based products must be considered as the main structural material for new government funded buildings up to four floors.
- The Japanese government introduced a law requiring wood to be considered as the primary building material for any government-funded project up to three stories, and for any privately funded building used in a public manner such as elderly care facilities.
- In Canada, the governments of British Columbia, Ontario, and Quebec have policies that encourage the use of wood in public buildings.

The Squamish Adventure Centre, designed by Iredale Group Architecture, is a landmark building that welcomes visitors along the scenic Sea-to-Sky Highway between Vancouver and Whistler, British Columbia. Solid sawn timber has the lowest embodied energy of any major building material, and local harvesting, milling and fabrication minimize transportation energy while providing economic benefits to the region.



Organizations and Networks

The **U.S. Green Building Council (USGBC)** and the **Canadian Green Building Council** are non-profit organizations that aim 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. USGBC has developed the LEED rating system. For more information:

www.usgbc.org (United States)

www.cagbc.org (Canada)

www.worldgbc.org (international)

The **National Association of Home Builders (NAHB)** is a trade association for the housing and building industry in the United States. NAHB is a federation of more than 800 state and local associations. Its affiliates include the Home Innovation Research Laboratory. For more information: www.nahb.org

The **Green Building Initiative** is a not-for-profit education and marketing initiative dedicated to accelerating 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. For more information: www.thegbi.org

The **American Institute of Architects (AIA)** serves as the voice of the architecture profession and the resource for their members in service to society. For more information: www.aia.org

The **Royal Architectural Institute of Canada (RAIC)** is a voluntary national association representing professional architects, and faculty and graduates of accredited Canadian Schools of Architecture. For more information: www.raic.org

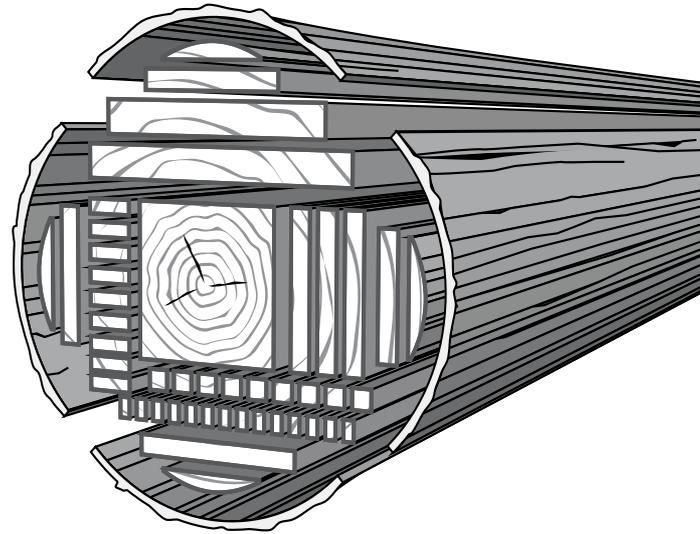
The **Architectural Institute of British Columbia** is an independent, professional self-regulatory body established in 1920 by provincial statute – the Architects Act. It is the AIBC's mandate to regulate the profession of architecture within the province in the public interest. For more information: www.aibc.ca



Samuel Brighthouse Elementary School, Richmond, B.C.

Architect: Perkins+Will Canada Architects Co.

Photo: BaseTwo Media Inc.



Other Resources

Energy Star

(www.energystar.gov) is an international standard for energy-efficient consumer products. First created as a U.S. government program in 1992, it operates in Canada, Europe, Japan and Australia. Energy Star rates energy-related value for products in more than 35 categories, including HVAC systems, lighting fixtures, office equipment, roofing products, windows, doors and skylights.

The U.S. Environmental Protection Agency's Environmentally Preferable Purchasing

(www.epa.gov/opptintr/epp) rates building materials and products based on pollution prevention, life cycle analysis, comparison of environmental impacts, environmental performance, and environment/price performance ratio. Product categories include: paints, plumbing, HVAC, lighting, gypsum board, carpets, concrete, coatings, sealants, flooring, doors, and windows.

Green buildings

- Mitigate climate change
- Use less energy and water
- Use fewer materials
- Reduce waste
- Are healthy for people and the planet

On the cover:

Gulf Islands Operation Centre, Sidney, B.C.

Architect: Larry McFarland Architects

Photo: Derek Lepper

naturally:wood®

British Columbia wood. Sustainable by nature. Innovative by design.

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