




Building  
Green with  
Wood



MODULE 4

Resource  
Conservation



**Vancouver Materials Testing Lab:**  
About three-quarters of the Materials Testing Lab's structure and fabric consists of salvaged and recycled materials, mostly from a warehouse that was dismantled on site.

## Using Resources Wisely

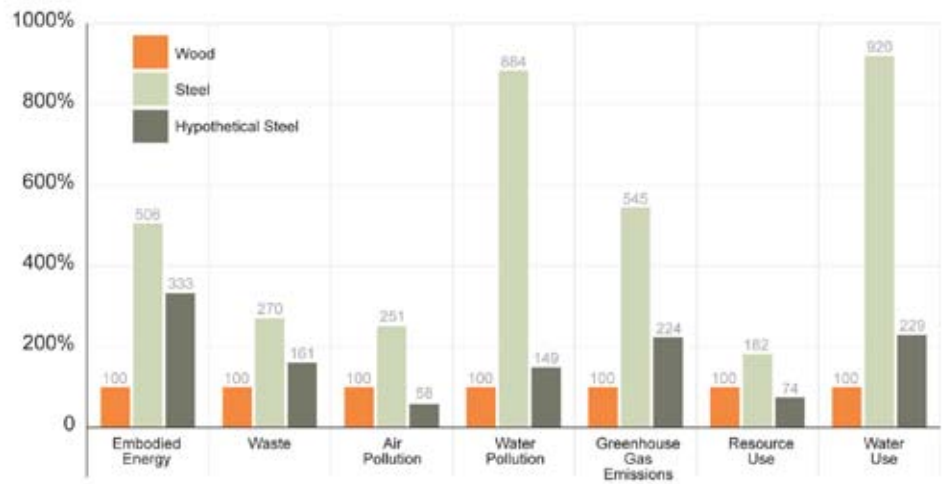
Responsible resource management is essential if we are to reach the goal of true sustainable development. Sometimes this will mean using less, but it will always mean choosing products with the lightest carbon footprint possible.

When it comes to building construction and renovation, this means identifying materials, manufacturing processes and design strategies that:

- minimize the use of non-renewable resources;
- minimize waste during the extraction and manufacturing process;
- minimize the use of fossil fuel energy during extraction and manufacturing;
- use products that are flexible, adaptable and durable;
- enable the reuse of materials and products from dismantled buildings; and
- recycle materials only when no longer fit for their original purpose.

## A Closer Look at Recycled Content

This bar chart compares life cycle assessment environmental profile of two standard structural post-and-beam systems, and one theoretical steel with 100 per cent recycled content.



## Benefits of Wood

It is possible to address every one of these points by selecting wood building products.

- 1. When grown and harvested** according to internationally recognized sustainable forest management practices, wood is the only major construction material that is **100 per cent renewable**.
- 2. Fully 97 per cent of the fibre** removed from the forest in Canada is used for the highest-value products possible, and mill residues such as chips, cut-offs and sawdust are used to make high-value composite materials such as pulp, medium-density fibreboard and finger-jointed lumber.
- 3. When wood waste is burned, it is considered carbon neutral** because it only releases the carbon sequestered in the wood during the growing cycle. Wood products have the least embodied energy of all major building materials<sup>1</sup>, in other words, the energy consumed to grow, harvest, transport and manufacture them is less than for alternative products. In addition, only half of that energy is from fossil fuel. The other half is supplied by wood waste generated during manufacturing – this is a self-sufficient, renewable, carbon-neutral energy source.
- 4. A building's structural design** and spatial subdivision determines its ability to be flexible in use, and adaptable so it can meet new requirements. Separating these functions makes it easier to reconfigure the space. Wood lends itself to this design approach, especially through the use of post-and-beam structures (in solid sawn lumber or engineered wood) and non-load-bearing partitions made up of smaller members (either solid laminated or in stud frame construction).
- 5. Wood lends itself to dismantling**, a fact borne out by the continued predominance of wood and wood products in the architectural salvage market. It can generally be reclaimed without diminishing its value or usefulness for future applications. This contrasts with materials like concrete, which is usually crushed for future use as aggregate or ballast, or brick, which can be easily damaged when cleaned for reuse, and which can rarely be reassembled with the original precision.
- 6. Structural wood members** can typically be reclaimed and reused for the same or similar purpose with only minor modifications or wastage. Equally, the same material if desired can be remilled and fashioned into window and door frames, curtain wall components or cladding. The most celebrated recent example of this kind of reuse is the Materials Testing Facility in Vancouver, designed by Busby Perkins + Will, which reuses reclaimed lumber from a demolished warehouse in each of these applications. Short lengths of lumber that may be a byproduct of the re-milling process, can typically be reused for bracing and blocking elements. Any wood components too small to reuse, as well as any wood chips and sawdust left over, can be processed into mulch for landscape use or to provide organic material to promote decomposition in landfills.

<sup>1</sup> Werner, Frank and Richter, Klaus, Scientific Journals April 2007; Wooden Building Products in Comparative LCA: A Literature Review.

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*The Richmond Olympic Oval was built for the 2010 Olympic and Paralympic Winter Games in Vancouver, and will become a multi-sport and wellness facility for the local community after the games. The unique roof system is made with wood affected by the mountain pine beetle infestation in British Columbia's interior, making it an important tool in mitigating the impacts of climate change by sequestering carbon.*



*Wood Anchor, a Manitoba company, produces tables from 100% recycled grain elevator beams – that come complete with cracks, nail holes, stains and other character marks associated with reclaimed wood.*

