

Western Red Cedar Shakes and Shingles

Preliminary Life Cycle Impact Assessment Results



The Marketplace Has Gone Green

The environmental attributes of building products are important considerations for project specifiers. Architects, builders, and their clients now include environmental cost factors in their decision making process. Life cycle data is critical to obtaining green building ratings now commonly seen in request for proposal documents. In 2007, the Cedar Shake and Shingle Bureau ("CSSB") commissioned a Life Cycle Assessment of four Western Red Cedar Shake and Shingle Roofing Products: 24"x3/4" Heavy Handsplit and Resawn Shakes; 24"x1/2" Medium Handsplit and Resawn Shakes; 24"x5/8" Tapersawn Shakes; and 18" Perfection Shingles. The preliminary findings of this report are included in this flyer.

Being certified or granted points under a green building program requires the structure to meet a host of detailed project criteria. Some of this project data can be sourced through Life Cycle Assessment ("LCA"). LCA, and especially its most developed component, Life Cycle Inventory ("LCI"). There are tools that provide quantitative and scientific analyses of the environmental

impact of products and systems. These rating systems require compilation/evaluation of material and energy resources used and emissions to air, water and land throughout the life cycle of a product. This includes raw material extraction, through production and ultimately to the product's end-of-life.

Life Cycle Impact Result

This table presents results for one of the four products by unit process on an absolute and percent contribution basis: **Western Red Cedar 24"x3/4" Heavy handsplit and Resawn Shakes**

Impact category	Unit	Total WRC 24" x 3/4" HHRS	Harvesting	Resource Transportation	Product Manufacturing
Global Warming	kg CO2 eq.	7.956	5.777	1.167	1.013
Acidification	kg H+ moles eq.	6.106	4.936	0.613	0.560
Eutrophication	kg N eq.	0.0055	0.0048	0.0005	0.0001
Solid wastes	kg	0.225	0.030	0.006	0.189
Primary Energy	MJ	114.101	80.514	16.127	17.460
Impact category % Contribution		Total	Harvesting	Resource Transportation	Product Manufacturing
Global Warming		100%	73%	15%	13%
Acidification		100%	81%	10%	9%
Eutrophication		100%	88%	10%	3%
Solid wastes		100%	13%	3%	84%
Primary Energy		100%	71%	14%	15%

Courtesy of Athena Sustainable Materials Institute, March 2007, A Life Cycle Assessment of Western Red Cedar Shake and Shingle Roofing Products

To put this chart's findings into relative terms, it was found that the primary energy use and global warming potential of heavy handsplit and resawn shakes was equivalent to 0.33 BBQ tanks. This means low energy use and low ghg emissions, which again reflects the labor, rather than energy, intensive nature of manufacturing of handsplit shakes. Production of WRC cedar shakes and shingles has a small impact on the environment, resulting in a high quality product with a

lower embodied effect. Co-products resulting from the cedar shake and shingle manufacturing process include wood chips, hog fuel and sawdust, used for a variety of additional purposes including landscaping and clean biomass energy creation. A 2007 study conducted by the Athena Sustainable Materials Institute determined that "less than 1% of the incoming resource is categorized as waste destined for landfilling." (*Executive Summary, A Life Cycle Assessment of Western Red Cedar Shake and Shingle Roofing Products*, Athena Sustainable Materials Institute, March 2007.)

The Benefits of Specifying Western Red Cedar Shakes and Shingles

CSSB Members proudly manufacture shakes and shingles that are lightweight, attractive, naturally decay resistant, fire, wind and impact resistant, and offered in a variety of product styles and finishes.



It is already a proven fact that **wood designed buildings consume less energy, emit less greenhouse gases, release less air pollution, discharge less water pollution, use less resources from a**

weighted resource perspective and produce less solid wastes than steel or concrete designed buildings. (Page 12-13, *Energy and the Environment in Residential Construction*, Sustainable Building Series, No. 1, 10M-08-04, Canadian Wood Council.) Cedar roofing materials have high R-values (thermal resistance) and this excellent insulative quality keeps homes warmer in the winter and cooler in the summer. This conserves energy and reduces the imprint left on the environment.

The cedar shake and shingle industry maximizes the wood resource brought into its manufacturing

facilities. A little known fact about cedar shakes and shingles is that many are actually made from salvaged wood fiber, that is, wood left over from past logging work or windblown material left on the forest floor. With this material being of unsuitable size for lumber mills, cedar shake and shingle producers use helicopter and manual methods to remove it from the forests in a habitat sensitive way, thus ensuring the best use of a valuable resource. Trees are a renewable resource so the use of wood building products is an environmentally sound choice. The forest industry replaces what it removes; the



same cannot be said of iron ore, precious oil reserves, bauxite or limestone, all used to create alternative building products. In addition, the energy that is used, and the pollution that is created in the manufacturing of alternative

products, is a much more serious issue than wood harvesting has ever been. Wood is also non-toxic, energy efficient to produce and eminently recyclable and biodegradable, unlike the substitute products that can linger in landfills for decades, if not longer.

Environmental Considerations

Cedar shakes and shingles minimizes the overall environmental cost to society, thus reflecting smart building practices. As a specifier you need to make the right building product choices for your clients. Specifiers are encouraged to check if the particular green building system being used gives all types of building products equal consideration. Some helpful questions to ask are:

- Is the building product manufactured from a renewable resource?
- Is the building product recyclable or does it sit in landfills for a long time?
- What is the energy efficiency of the building product once it has been installed?
- How long has the product been proven in actual field applications?
- Are you comparing LCA data calculated with the same methodology and data types?

With such an array of data in the marketplace today, informed, well-researched choices will help clients the most. Choosing wood, specifically cedar roofing materials, is a decision made on sound judgment, proven product performance and impressive environmental benefits.



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