

# Demonstrating Wood's Carbon Benefits

*Canadian wood products are net carbon sinks.*

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## A Carbon Footprint of Four Canadian Wood Products Delivered to the UK

*as per PAS 2050 Methodology*



### SUPPORTING DESIGN DECISIONS WITH FACTS

The idea that wood products have a low carbon footprint is intuitive. Wood grows naturally, using energy from the sun, and doesn't require large amounts of fossil fuels to manufacture. As they grow, trees absorb carbon dioxide (CO<sub>2</sub>) from the atmosphere and release oxygen (O<sub>2</sub>), and wood products continue to store carbon (C) over their lifetimes—even longer if the wood is reclaimed and used elsewhere.

However, the UK's ambitious shift to a low-carbon economy means that building designers and specifiers need a greater level of detail. They need reliable data on the carbon footprint of individual wood products.

With this in mind, two Canadian research organizations—the Athena Institute and FPInnovations—have completed a study on the carbon footprint of four wood products manufactured in Canada and delivered to the UK:

- Softwood lumber
- Softwood plywood
- Western red cedar lumber
- Western red cedar siding

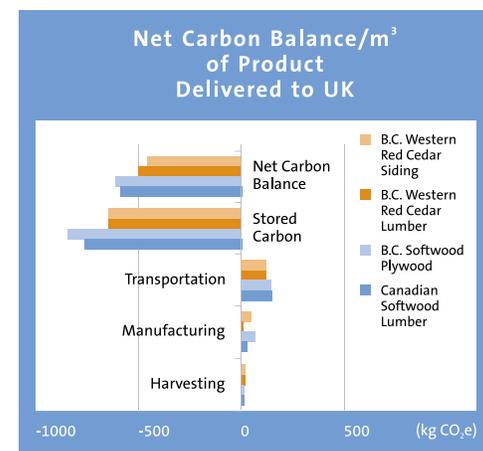
In all cases, despite being transported more than approximately 16,000 kilometres (km), the study has confirmed that these products represent a net carbon sink upon delivery—that is, each product stores more carbon

than is emitted during its respective harvest, manufacture and transport.

Canadian wood products are valued for their quality, and because Canadian forests are sustainably managed under some of the toughest regulations in the world. As this study demonstrates, they can also help UK designers achieve their low-carbon objectives and obligations.

### VERIFYING WOOD'S NEGATIVE CARBON BALANCE

This graphic shows the carbon balance for the four wood products as delivered from Canada to the UK, all of which store considerably more carbon dioxide equivalent (CO<sub>2</sub>e) than is emitted during their harvest, manufacture and transport.



*Results shown are per cubic metre (m<sup>3</sup>) of product\**

## BASED ON UK STANDARD METHODOLOGY

Even among signatories to the Kyoto Protocol, the UK has shown itself to be a leader in climate change mitigation. It was the first country with a legally-binding framework to reduce carbon emissions, and one of the first to have a publicly available specification — known as PAS 2050 — for assessing the carbon footprint of individual products and services using life cycle assessment (LCA).

To ensure transparency and consistency with UK data, the study of Canadian wood products was completed in accordance with PAS 2050 methodology.

## CARBON STORAGE VS. EMISSIONS

In all cases, emissions of CO<sub>2</sub>e from harvesting, manufacturing and transportation to the UK represent less than one third of the amount stored in the wood products. Further, all of the products remain a net carbon sink (indicated with a negative value) across all three calculated service lives.

	Softwood Lumber	Softwood Plywood	Western Red Cedar Lumber	Western Red Cedar Siding
<b>Carbon stored in one cubic metre (m<sup>3</sup>) of product*</b>	765 kg	824 kg	632 kg	632 kg
<b>Emissions from harvesting, manufacturing and transportation</b>	185 kg	224 kg	139 kg	187 kg
<b>NET CARBON BALANCE</b>				
<b>100-year service life</b>	<b>-580 kg</b>	<b>-600 kg</b>	<b>-493 kg</b>	<b>-445 kg</b>
<b>75-year service life</b>	<b>-389 kg</b>	<b>-394 kg</b>	<b>-335 kg</b>	<b>-287 kg</b>
<b>50-year service life</b>	<b>-198 kg</b>	<b>-188 kg</b>	<b>-177 kg</b>	<b>-129 kg</b>

*To allow comparison, results are shown in CO<sub>2</sub>e. \*One cubic metre is equivalent to 630 board feet (bf) of softwood lumber, 1,184 square feet (3/8") of softwood plywood, 630 bf of western red cedar lumber, and 510 bf of western red cedar siding.*

## ENCOURAGING RESPONSIBLE STEWARDSHIP

Canada is the world's leading exporter of wood products, not only because it is home to 10 per cent of global forests, but because of its commitment to ensuring the future health and abundance of this vital natural resource.

More than 90 per cent of Canada's forests are owned by the public and managed on its behalf by government. In addition to strict regulations that require harvested lands to be promptly regenerated, Canada has more third-party certified forests and more protected forests than any other country. The rate of deforestation has been virtually zero for more than two decades, and illegal logging isn't an issue as it is in many other parts of the world.

The study took into consideration all emissions associated with resource extraction, manufacturing processes and delivery from the port of Vancouver, British Columbia (B.C.) to the port of Thamesport in the UK. Under PAS 2050, carbon stored in a wood product may be included in the assessment of its carbon footprint. However, the amount must be calculated based on the estimated lifetime of the product relative to its 100-year global warming potential—i.e., if the product remains in service for 100 years, it receives full credit for the carbon contained in the product; if it remains in service for 75 or 50 years, it receives 75 per cent or 50 per cent credit respectively.

UK building designers have an opportunity to encourage responsible stewardship worldwide by giving buying preference to countries like Canada that manage their forests sustainably. Now, with the carbon details on four widely used wood products, there's even more reason to choose Canadian wood.



## THE ENERGY CONNECTION

Biomass is recognized under PAS 2050 as a renewable energy source that contributes to a product's low carbon footprint. It includes organic materials such as residues from forestry practices and by-products of wood and paper manufacturing, and is a carbon-friendly substitute for fossil fuels such as coal and natural gas. Bioenergy is widely used by the Canadian forest industry and is yet another reason for the low carbon footprint of its products.

Wood also contributes to a building's energy efficiency because it is a better insulator than other materials, which can lead to lower costs for heating and air cooling. In contrast, steel and concrete must overcome lower R-values associated with thermal bridging and require more insulation to meet the same level of energy efficiency.

## ADDITIONAL RESOURCES

The research described in this paper is part of a growing library of materials developed to help designers satisfy their low-carbon objectives with Canadian wood products—whether to comply with government legislation or achieve certification under a green building rating system. For more information, visit [www.naturallywood.com/resources](http://www.naturallywood.com/resources).

### FOR MORE INFORMATION



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About 50% of wood products exported from Canada come from the Province of British Columbia's sustainably-managed forests. This publication is part of the 'Forest Facts' series, published by Forestry Innovation Investment. Visit [www.naturallywood.com](http://www.naturallywood.com) for details.

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