

Katerra CLT and the Environment

Updated March 2021

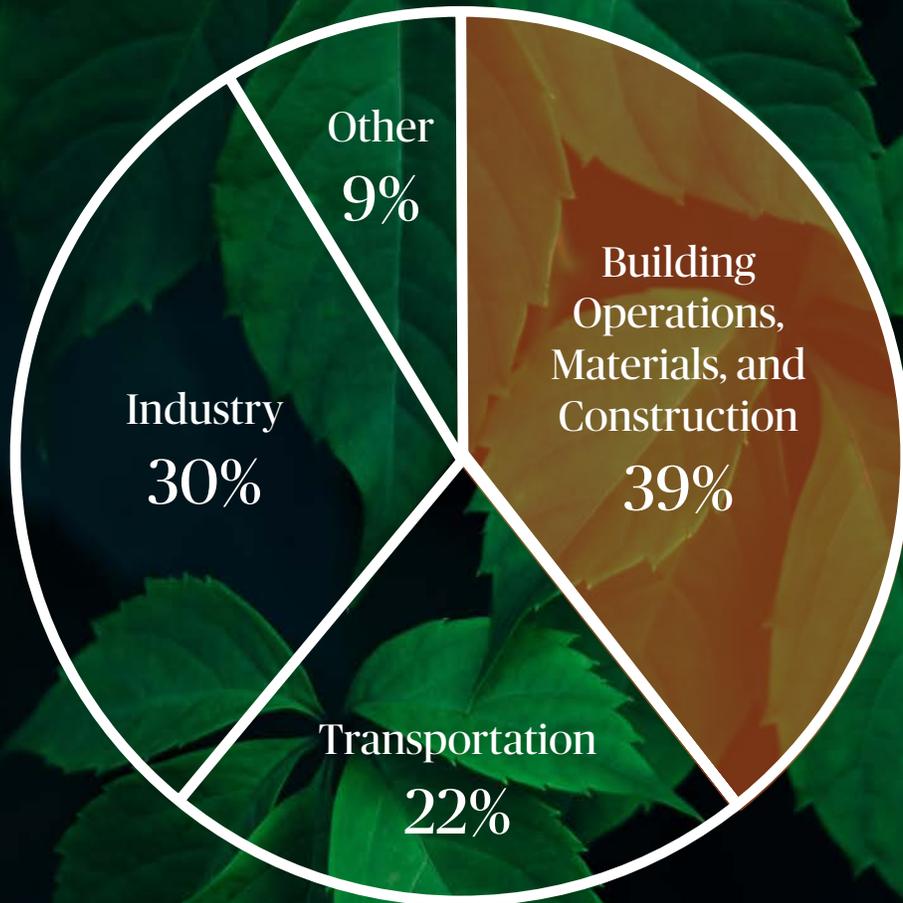
Introduction

At Kattera, we believe Cross-Laminated Timber (CLT) will become the backbone for future generations of high-performance, low carbon buildings across North America.

As building energy efficiency improves and the planet rapidly urbanizes, embodied carbon is estimated to be responsible for almost half of new construction emissions between now and 2050¹. Utilizing construction materials with lower embodied carbon can significantly reduce a building's negative environmental impacts.

CLT provides lighter, stronger, and a more sustainable alternative to carbon-intensive concrete and steel structures, but limited availability in the North American market has constrained its adoption. Kattera is changing that. Our CLT facility in Spokane Valley, Washington was built to bring environmentally-responsible, cost effective mass timber building systems to the North American market.

Global CO₂ Emissions by Sector ²



Environmental Certifications

Chain of Custody

Chain of custody traces the path of wood from certified forests through the supply chain to the final product, addressing factors including biodiversity, habitat conservation, sustainable harvest levels, and watershed protection.

Kattera's CLT factory in Spokane Valley, Washington has earned chain of custody certification³ for three major certification programs:



Forest Stewardship Council® (FSC™ C156195)



Programme for the Endorsement of Forest Certification (PEFC/29-31-382)



Sustainable Forestry Initiative® (SFI™-03536)

Responsible Sourcing

Sustainably managed forests support rural economies. Kattera has adopted strict internal policies to govern procurement of 100% of our CLT lumber from well-managed forests, strategically sourcing species from forests known for their tight grain structure, integrity, and quality.

Transparency

Kattera is committed to third-party environmental certification and material content disclosure. Our CLT product line has earned a Declare Label⁴ from the International Living Future InstituteSM and is certified "LBC Red List Approved" for use on Living Building Challenge projects.

We are also committed to procuring a Type III Environmental Product Declaration (EPD) to ISO 14025 for our CLT product line, anticipated to commence in 2021 now that the factory has been in operation for a minimum of 12 months in accordance with the standard.



Green Building Rating Programs

The inclusion of CLT on a project can help advance credit achievement for various green building rating programs, including Leadership in Energy & Environmental Design (LEED), the Living Building Challenge (LBC), the Passivhaus Standard, and the WELL Building Standard. Upon request, Katerra can provide guidance on how our CLT product can contribute to achieving select credits or green building goals.

Credit Potential

Through chain of custody certifications, its Declare label, and a forthcoming Environmental Product Declaration, Katerra promotes transparency about the life-cycle impact of our CLT product. This can help achieve credits related to sourcing, material restrictions, transparency, and education. When used in an enclosure assembly, CLT contributes to a building’s thermal integrity and energy code compliance. In turn, this can help achieve credits related to energy efficiency and thermal performance. Exposing CLT at interiors showcases the material’s natural grain and tonal warmth, promoting illuminance and a connection to nature, which supports occupant health. This can help achieve credits related to wellness and biophilia. Compared to conventional structural systems, CLT production and installation generates minimal waste and debris, which can help achieve credits related to material optimization and construction waste reduction.



Passive House 3rd edition

Core Principles

- Thermal Insulation
- Thermal Bridge Reduced Design
- Airtightness



LEED v4.1 BD+C

Indoor Environmental Air Quality

- Low-Emitting Materials
- Thermal Comfort

Materials & Resources

- Environmental Product Declarations
- Responsible Sourcing of Raw Materials
- Building Life-Cycle Impact Reduction
- Construction & Demolition Waste Management



WELL v2

Materials

- Materials Transparency

Mind

- Nature & Place
- Restorative Spaces

Thermal Comfort

- Thermal Performan
- Verified Thermal Comfort



Living Building Challenge 4.0

Energy Petal

- Energy + Carbon Reduction
- Net Positive Carbon

Materials Petal

- Responsible Materials
- Responsible Sourcing
- Living Economy Sourcing
- Red List
- Net Positive Waste

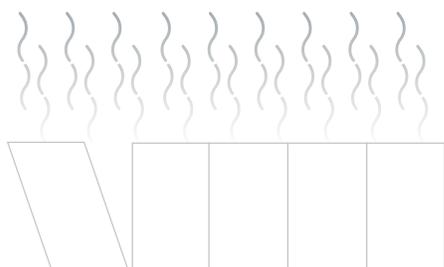
Beauty Petal

- Beauty + Biophilia

Carbon Impact

The Climate Benefits of CLT

Per square foot, CLT significantly reduces the carbon footprint of new buildings in comparison to structural concrete.



Concrete Tilt-up Wall

↑ **12.20 kgCO₂e**
GWP cradle-to-gate



Cross-Laminated Timber Wall

↓ **0.34 kgCO₂e**
GWP cradle-to-gate
including biogenic carbon

Global Warming Potential

During early-stage design exercises, Katterra can provide preliminary assessments of a project's carbon footprint through an informal Global Warming Potential (GWP) study. This can involve quantifying the comparative carbon benefit of using mass timber versus conventional building systems, or translating the total volume of CLT to equivalencies of greenhouse gas reduction. These studies do not intend to replace formal Life Cycle Assessments, but instead endeavor to open a design conversation with a project's stakeholders about opportunities to reduce potential carbon impact of a forthcoming project.

Life Cycle Assessment

Compared to conventional construction, Katterra CLT carries lower embodied carbon and global warming potential, which would be demonstrated in a project's formal Life Cycle Assessment (LCA). Upon request, Katterra can provide completed, critically-reviewed LCA's for reference, which can help highlight the expected impact CLT can have on a new project.

Efficiency + Performance

Material Efficiency

Our CLT panels are manufactured with small dimensional lumber, making them more resource efficient than conventional heavy timber framing. Kattera also offers the opportunity to work with clients to design solutions around optimal cut panel dimensions, to maximize use of pressed billets and minimize material waste. Where generated, manufacturing byproducts are collected for secondary uses, including as furniture, fuel, and chipped material source for fiberboard and particleboard manufacturing.

Construction Efficiency

Mass timber building systems enable increased construction productivity, with automated fabrication in a controlled factory environment reducing waste and enabling streamlined field assembly. Mass timber buildings are roughly 25% faster to construct and require up to 90% less construction traffic than concrete buildings⁶.

Integrated Design

With natural wood's pleasing aesthetic, CLT structure can be left visually exposed, eliminating supplemental finish materials. Kattera's 5-ply CLT panels also exceed a two-hour fire rating, meaning additional fire resistance treatments can be minimized. Mass timber buildings are significantly lighter than comparable concrete buildings, reducing foundation size and seismic forces in addition to associated embodied energy⁵. When deployed as a component of the thermal envelope, Kattera CLT can also contribute to efficiency in a building's thermal design: CLT is an airtight thermal mass with low conductivity, carrying a nominal value of R-1.25 per inch, helping to minimize additional insulation where required. Kattera CLT can also be designed for deconstruction: through simple connection detailing, a design can promote future panel removal and material reuse, and limit impact or damage to adjacent assemblies that would otherwise need replacement.

Living Economy

Humans have an affinity for natural materials and elements that incorporate or evoke nature, known as the "biophilic effect." Studies have found that subjects perceive wood as "warm," "inviting," "homey," and "relaxing" than all other tested materials, and demonstrate physiological and psychological benefits to viewing wood⁷. These attributes can help improve workplace wellbeing, staff retention, and organizational productivity. Through environmental certifications, Kattera's CLT also promotes the expansion of a regional economy rooted in sustainable practices.

¹ "New Buildings: Embodied Carbon," Architecture 2030.com, architecture2030.org/new-buildings-embodied

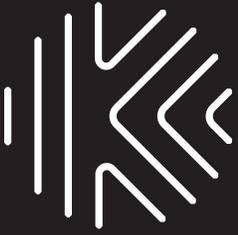
² UN Environmental Global Status Report 2017; EIA International Energy Outlook 2017

³ Chain of custody certification provided upon project request for the forest stewardship program specified. Consult with Kattera about layup availability for the certification requested.

⁴ Declare, Kattera Cross-Laminated Timber: <https://declare.living-future.org/products/kattera-cross-laminated-timber>

⁵ ⁶ "4 things to know about Mass Timber," ThinkWood.com, April 25, 2018, thinkwood.com/news/4-things-to-know-about-mass-timber

⁷ "Nature in Design: The Biophilia Effect," APA – The Engineered Wood Association.com, apawood.org/designerscircle-nature-in-design-the-biophilia-effect



Katerra Mass Timber

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